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A Visit to Kafiristan. By W. W. McNAIR.

(Read at the Evening Meeting, December 10th, 1883.)

Map, p. 56.*

IN introducing Mr. McNair to the meeting, the President (Lord ABERDARE) said that the paper he was about to read was an account of a visit he had recently made to Kafiristan. Mr. McNair had resided in India for a long time previous to his adventurous journey, and whilst in the service of the Topographical Department in the North-west of India, had been employed in surveys beyond the frontier in Afghanistan. His attention was thus directed to the interesting country which the paper would describe. Kafiristan was a country of very peculiar interest. The name Kafiristan, or the "country of infidels," was a nick-name given by the surrounding Mahommedans, and was not that by which it was called by the natives. It had long been a reproach to English geographers that the only accounts of Kafiristan had been obtained through Orientals themselves, whose statements had never been tested by the actual visit of Europeans to the country. The consequence was that a sort of mystery surrounded Kafiristan,—so much so that Colonel Yule, when discussing an interesting paper by Colonel Tanner, on a visit he made to the borders of the Kafir country three years ago, said that when Kafiristan was visited and explored the Royal Geographical Society might close the doors, because there would be no more new work to be done. The veil had at last been drawn aside. It might be asked why the country had been so long held inaccessible. The explanation was that the inhabitants were always at war with their Mahommedan neighbours, by whom they were surrounded on all sides, and who had been extremely jealous of their communication with European travellers. Mr. McNair had penetrated Kafiristan in disguise. He (the President) had had an opportunity of seeing the paper, and he found that Mr. McNair had not dwelt upon the historical geography of Kafiristan, and therefore he would say a few words on that subject. As long ago as 1809 Kafiristan attracted the attention of one of the ablest public servants that England ever sent out to India—Mountstuart Elphinstone, who was anxious to add to his 'History of Kabul' something about the people of Kafiristan and knowing that it was inaccessible to Europeans, he employed an Indian, a

* The map not being finished, its issue is deferred to our next number.

man of learning and intelligence, to travel there and obtain all the information he could. It was curious to notice how faithful the report of his emissary was. The people of the country were described in the following words: "The Kafirs were celebrated for their beauty and their European complexions. They worshipped idols, drank wine in silver cups or vases, used chairs and tables, and spoke a language unknown to their neighbours." Their religion seems to have been a sort of debased Deism: they believed in a God; at the same time they worshipped a great number of idols, which they said represented the great men that had passed from among them; and he described a scene at which he had been present, when a goat or a cow was sacrificed and the following prayer, pithy and comprehensive, although not remarkable for charity, was offered up: "Ward off fever from us. Increase our stores. Kill the Mussulmans. After death admit us to Paradise." Killing the Mussulman was a religious duty which the Kafirs performed with the greatest fidelity and diligence. In fact, no young man was allowed to marry until he had killed a Mussulman. They attached the same importance to the killing of a Mussulman as the Red Indians did to taking the scalp of an enemy. Their number did not appear to exceed 250,000. They inhabited three valleys, and small as their number was they were constantly at war with each other, and seized upon the members of kindred tribes in order to sell them as slaves. The women were remarkable for their beauty; and Sir Henry Rawlinson once said at one of their meetings that the most beautiful Oriental woman he ever saw was a Kafir, and that she had, besides other charms, a great mass of golden hair, which, let loose and shaken, covered her completely from head to foot like a veil. In order to show what was the state of our knowledge of the country down to 1879, he would read part of a paper by Mr. Markham on "The Upper Basin of the Kabul River." "This unknown portion of the southern watershed of the Hindu Kush is inhabited by an indomitable race of unconquered hill-men, called by their Muslim neighbours the Siah-posh (black-clothed) Kafirs. Their country consists of the long valleys extending from the Hindu Kush to the Kunar river, with many secluded glens descending to them, and intervening hills affording pasturage for their sheep and cattle. The peaks in Kafiristan reach to heights of from 11,000 to 16,000 feet. The valleys yield crops of wheat and barley, and the Emperor Baber mentions the strong and heady wine made by the Kafirs which he got when he extended his dominion to Chigar-serai in 1514. The Kafirs are described as strong athletic men, with a language of their own, the features and complexions of Europeans, and fond of dancing, hunting, and drinking. They also play at leap-frog, shake hands as Englishmen, and cannot sit cross-legged on the ground. When a deputation of Kafirs came to Sir William Macnaghten at Jalalabad the Afghans exclaimed: 'Here are your relations coming!' From the days of Alexander the Great the Siah-posh Kafirs have never been conquered, and they have never embraced Islam. They successfully resisted the attacks of Mahmud of Ghazni, and the campaign which Timur undertook against them in 1398 was equally unsuccessful. But the Muslim rulers of Kabul continued to make inroads into the Siah-posh country down to the time of Baber and afterwards. Our only knowledge of this interesting people is from the reports of Mahommedans, and from an account of two native missionaries who penetrated into Kafiristan in 1865. Elphinstone obtained much information respecting the Kafirs from one Mullah Najib in 1809; and Lumsden from a Kafir slave named Feramory, who was a general in the Afghan service in 1857. Further particulars will be found in the writings of Burnes, Wood, Masson, Raverty, Griffith, and Mohun Lal." In recent years, Major Biddulph entered from Kashmir through Gilgit and made his way to Chitral, and Colonel Tanner advanced from Jalalabad a short distance into Kafiristan, among a portion of the people who had been

converted to Mahomedanism, but who still retained many of the peculiarities of the Kafir race. Dr. Leitner had also taken great pains to obtain information about this ancient and unconquered people, but Mr. McNair was the first European who had ever penetrated into Kafiristan.

Mr. McNair then read as follows:—

In the September number of this Society's 'Proceedings,' p. 553, under the heading "An Expedition to Chitral," allusion is made to my being accompanied by a native explorer known "in the profession" as the Saiad; it is to this gentleman that I am indebted for the partial success that attended our undertaking. I say partial advisedly, inasmuch as the original programme we had marked out, of penetrating into the heart of Kafiristan, fell through, for reasons that will appear as I proceed with the narrative.

The Saiad, whose name I need not mention, had been made over to me more than a year ago by Major Holdich to instruct. This led to a mutual friendship, and on his explaining to me that he had a plan of getting into the Kafir country, which was by accompanying Meahs Hosein Shah and Sahib Gul (who yearly go to Chitral either through Dir or via the Kunar Valley) as far as Birkot and then following up the Arnawai stream, crossing the hills to the westward and returning to Jalalabad either by the Alingar or Alishang rivers, I suggested accompanying him in the guise of a Hakim or Tabib, i. e. native doctor. He was to be accompanied by Meah Gul, a Kafir convert. The two Meahs of course had to be consulted, and after some difficulty I succeeded in getting their consent, having convinced them that the undertaking was entirely at my own risk, and that in the event of my detection they would be freed from all responsibility. I next sent in my papers for a year's furlough with permission to spend the first half in India. This was granted, and my leave commenced from March 27th. By April 9th I was at Nowshera, and by 3 o'clock on the following morning, with head shaved, a weak solution of caustic and walnut-juice applied to hands and face, and wearing the dress peculiar to the Meahs or Kaka Khels, and in company with Hosein Shah, I sallied out as Mir Mahomed or Hakim Sahib.

It may not be out of place if I here mention that the Kaka Khel section of Pathans, to which the two Meahs belong, are not only very influential, but are respected throughout both Afghanistan and Badakshan. The Kafirs also pay them a certain amount of respect, and will not knowingly attack them, owing to an epidemic of cholera which once broke out amongst them immediately after they had returned from murdering a party of Kaka Khels, and which they superstitiously attributed to their influence. They number in all a few short of 3500; this includes menials and followers. Though really considered spiritual advisers they are virtually traders, and I do not think I am far wrong in saying that they have the monopoly of the trade from Kabul east-

ward to the borders of Kashmir territory. If you say that you are a Meahgan or Kaka Khel, words signifying one and the same thing, you have not only access where others are questioned, and a sort of black mail levied on them, but you are treated hospitably, and your daily wants supplied free of cost—as was often the case with us. Of course the Meahgans have to make some return. It is done in this wise: a fair lasting from five to seven days is yearly held at Ziarat, a village five miles south-west of Nowshera, the resting-place of the saint Kaka Sahib; it is resorted to by thousands from across our north and east frontiers, and all comers are housed and fed by the Meahs collectively. Offerings, it is true, are made to the shrine, but I am told the amount collected is utilised solely for the keeping up of the shrine.

What follows is taken from my diary, which I stealthily managed to keep up during my journey. It was not till April 13th that we were fairly across the British frontier. The interval of four days was spent in getting together all necessaries. The rendezvous was for the 13th at Ganderi, and true to appointment all were present, our party then consisting of forty, including muleteers, and fifteen baggage animals. In the shape of provisions, we had nothing but sugar and tea. The contents of our loads (I should say goods, only that we got very little in return) were cloths of English manufacture, musical boxes, binoculars, time-pieces, a spare revolver or two with a few rounds of ammunition, salt, glass beads, shells, needles, country-made looking-glasses, shoes, and lungis, as well as several phials and galipots of medicines. In addition to these I had secreted a prismatic and magnetic compass, a boiling-point and aneroid thermometer, and a plane-table which I had constructed for the occasion. The last-mentioned instrument answered famously the purpose for which it was intended, and was in use from the beginning to almost the end of my journey. It answered, in case of a surprise, to pass off for a tabib book of prescriptions; all that was necessary was to slip off the paper that was in use inside one of the folds and expose to the gaze of the inquisitive individual merely a book or rather the outer case of one, in which I had written several recipes in Urdu. The instruments were either carried by the Saiad or myself in a *gooda*, i.e. untanned skin of goat or sheep invariably used by travellers in this region.

The Malakand Pass (elevation 3575 feet) is well wooded with brush-wood and stunted oak; grass and a goodly supply of water from springs are procurable all through the year. The ascent is easy, and practicable for heavy baggage. The descent into the Swat Valley is not nearly so easy; beasts of burden as well as foot-passengers have to pick out their way, but a company of Bengal or Madras sappers would in a few hours clear all difficulties sufficiently well to allow a mule battery to keep up with infantry. When once in the plains this state of things changes; where previously one had to avoid loose rocks and boulders,

we had now to search for a dry spot on which to alight. Both banks of the river are irrigated; the soil is very rich, and well adapted for rice cultivation. The valley has the reputation of being very unhealthy, owing, I have no doubt, to the effluvia arising from the damp soil. A Swatie is easily recognised by the sallow appearance he presents—a striking contrast to his nearest neighbours.

The Swat river is about 50 feet wide, from three to four deep, and flush with its banks. We crossed over in *jalas* (i. e. inflated skins) opposite the large village of Chakdara; the loads were taken off, and our animals forded the stream with little or no difficulty. Almost due north of our crossing, and distant eight miles, lay the village of Kotigram. The valley, known as the Unch Plain, is somewhat open, narrowing as we neared the village. Midway, about Uncha, we passed several topes or Buddhist remains. These topes are very numerous, at least twenty were visible at one time, and some of great size and in a very good state of preservation—more than one quite as large as the famous tope of Mani Kiyala. A little further up the valley towards the Katgola Pass, to the left of our route, there were numerous excavated caves, in the side of the hill, in one of which the traveller could take shelter during a passing shower. The ascent to the Laram Kotal is easy, and though the south face of this range is somewhat denuded of both fir and pine, yet the soil is sufficiently rich to allow of cultivation on its slopes. On this pass, whilst taking some plane-table observations, I was within an ace of being detected from an unexpected quarter. Four men armed with matchlocks showed themselves. Much quicker than it takes me to record it, the ruler or sight-vane was run up my long and open sleeve, and I began to pretend to be looking about for stray roots; the intruders were thrown off the scent, and after a while assisted the Saiad in looking for odd roots for the supposed native doctor.

The descent from the pass, which registered 7310 feet, to Killa Rabat (3900 feet) in the Panjkhora Valley, was for the first half of the distance by a long and densely wooded spur, with an easy slope, but on nearing the foot we found it very stony. Our party was met at the entrance by the khan, and later on we were invited to dinner by him. Long before this I had got quite used to eating with my fingers, but on this occasion I must admit I found it unpleasant diving the fingers into a richly made curry floating in grease, and having at the next mouthful to partake of honey and omelet. The banquet lasted for an hour or more, and I was beginning to feel uncomfortable sitting on the ground in the one position so peculiar to Eastern nations, when the hookah came to my rescue, and allowed of a change in position.

We forded the Panjkhora a little above the fort, and by 5 P.M. reached Shahzadgai.

We found the chief busy with a durbar he was holding under a large chinar tree, and discussing the plan of attack on Kunater Fort. Our

introduction was somewhat formal, except in the case of Hosein Shah, who was very cordially received and publicly thanked for having responded to the chief's request to bring a doctor from India for him.

Rahmatullah Khan, chief of Dir, is an Eusafzai, ruler of a population exceeding 600,000. In appearance he is anything but prepossessing—small of stature and very dark in complexion for a Pathan; with not a tooth in his head, and the skin on his face loose and wrinkled, he presents the appearance of an aged man, though really not more than fifty-five.

I was at Shahzadgai seven days, and during that time succeeded in bringing round the chief, who was suffering from an ordinary cold and cough. I cannot say my stay was a pleasant one, for from early morn to dusk our hut was surrounded by patients, and inasmuch as the chief had recovered, it was considered a sufficient guarantee that, no matter what the ailment or disease might be, if only the tabib would prescribe, all would come right. Men with withered arms and legs, others totally blind, were expected to be cured, and no amount of persuasion would convince those who had brought such unfortunates that the case was a hopeless one. It was here that I got as a fee the antique seal which I have brought for exhibition to the meeting. The man who brought it had found it across the Panjkhora, opposite Shahzadgai, whilst throwing up some earthworks; it was then encased in a copper vessel. General Cunningham, to whom I showed the seal at Simla about three months ago, writes as follows:—"I am sorry to say that I cannot make out anything about your seal. At first I thought that the man standing before a burning lamp might be a fire-worshipper, in which case the seal would be Persian. I *incline*, however, to think that it may be an Egyptian seal. I believe that each symbol is one of the common forms on Egyptian monuments; this can be determined by one versed in Egyptian hieroglyphics." Since my arrival here I have submitted the seal to Sir Henry Rawlinson. The fact of its having been dug up in the Panjkhora Valley adds great interest to the relic.

On the 24th we left for Kumbar. Whilst here it got abroad that my friend Hosein Shah was accompanied by two Europeans in disguise. The originator of this report was no other than Rahat Shah Meah, a native in the confidence of our Indian Government, and enjoying the benefits of a *jagir* or grant of land in the district of Nowshera, given him for loyal services, but a sworn enemy of my two friends. He had sent letters to Asmar, Chitral, Swat, and Bijour, urging on the people to track out the Kafirs who were in company with the Meagans, and destroy them, as they could have gone with no other purpose than to spy out the land. Shao Baba took up the matter, and not until the Dir chief had written contradicting the statement and certifying that he had asked my companions to bring from India a hakim, were suspicions allayed. Unfortunately, in a country like Afghanistan, where fanaticism

is so rampant, once let it be even surmised that outsiders, and these the detested Kafirs, are about, the bare contradiction does not suffice, and the original idea only lies dormant, as our future progress showed.

Two marches took us from Kumbar (elevation 4420 feet) to Dir (5650 feet). Crossed *en route* the Barawal range; height of the pass is 8340 feet, by a very fair road, which can be ridden up. Here our party was joined by the Dir chief, who having settled his disputes, was proceeding to his capital.

The fort of Dir is of stone, but in decay; it has an ancient aspect, but this applies still more to the village of Ariankot, which occupies the flat top of a low spur detached from the fort by a small stream. The spurs fall in perpendicular cliffs of some 20 feet in height, and in these are traces of numerous caves similar to those already spoken of, and some of which are still used as dwellings by the Balti people, who come to take service as porters between Dir and Chitral. The population of the fort and valley exceeds 6000 souls.

Four more days were wasted by our party at Dir procuring carriers, as the Lowarai Pass (called Lohari by some) was not sufficiently clear of snow to admit of our baggage animals crossing it, and from all accounts brought in would not be so for another month. This decided us on procuring the services of Baltis, who had come from Daroshp and Chitral, and who preferred their wages being paid in cloths or salt to sums of money. I should here add that my companions had in the meanwhile received letters from the neighbourhood of Asmar, advising them not to pay a visit to Arnawai just then, as the rumours concerning us were not very favourable; so rather than remain where we were, I suggested visiting Chitral. The idea was adopted, the loads were made over to the men we had engaged, and the following morning we bade adieu to Rahmatullah Khan, and started for Mirga, elevation 8400 feet. Though the distance from Mirga to Ashreth is not more than ten miles, yet it took us almost as many hours to accomplish it. From Mirga to the Lowarai Kotal (elevation 10,450 feet) the route lay over snow. It is quite true what has formerly been related of the number of cairns on this pass, marking the burial of Mahomedan travellers who have been killed by the Kafir banditti, who cross the Kunar river and attack travellers on the road. Travellers as they pass throw stones upon those cairns, a method universal among the Pathans in such cases. But many bodies were still visible in various stages of decay and imperfectly covered. There is no habitation for about six miles on either side of the pass, and it is only when information reaches a village that they send out to cover the remains of the true believer. The only village between the pass and the Kunar river is Ashreth. The people of this village pay tribute to Dir as well as Chitral, and this tribute is rendered in the form of escort to travellers ascending the pass. But the people themselves are Shias and recently converted Kafirs, and are

known to be in league with the Kafir banditti, giving notice to the latter of the approach of travellers rather than rendering effective aid against them. Fortunately the ascent was easy and gradual. The descent is steeper, and in parts very trying. We had to cross and recross the frozen stream several times, owing to the sides of the hill rising almost perpendicularly from its base. To add to our difficulties, we had to pick our way over deep snow (even in May), not only over branches but tolerably large sized trunks of trees that had been uprooted. I was told that during the winter months a regular hurricane blows up this valley, carrying everything before it. The Pass (Kotal) forms the northern boundary of Dir territory.

Ashreth to Chitral (5151 feet) was done by us in three marches. It is at the head of the Shushai Valley that the village of Madalash lies, the inhabitants of which are alluded to by Major Biddulph, in his 'Tribes of the Hindu Kush,' as being a clan speaking amongst themselves the Persian tongue. They keep entirely to themselves, and enjoy certain privileges denied to their surrounding neighbours, and from what I learnt are credited as having come, over a couple of hundred years ago, from across the Hindu Kush, via the Dura Pass.

Between Daroshp and Chitral the passage by the river contracts to a narrow gorge, over which a wall was built more than two centuries ago to resist an attempted invasion by the troops of Jehangir. Up to this point the Mogul force are said to have brought their elephants, but finding it here impracticable to pass they turned back: this force came over the Lowarai Pass. The ascent from Jalalabad is impracticable, because the river runs in various places between Asmar and Chigar Serai in almost impassable gorges.

It was late in the evening when we arrived at Chitral, but as the Badshah was not feeling very well, beyond the usual salutations exchanged with Hosein Shah and Sahib Gul, all introductions were deferred till the following morning.

The following morning, before presenting ourselves to Aman ul Mulk, we sent him the following presents, viz. a Waziri horse, two revolvers, a pair of binoculars, several pieces of chintz and linen, twenty pounds of tea, sugar, salt, and several pairs of shoes of Peshawar manufacture, as well as trinkets for his zenana. After the preliminary and formal inquiries as to our health, the Mehter Sahib or Badshah alluded to the rumours regarding me, and wound up by saying that as he was a friend to the British, and his country at their disposal, I was at liberty to go about and do as I pleased, provided none of my followers accompanied me. Fortunately, our Indian Government think differently, and judge his character more correctly. This was not exactly what we had expected, but rather than be thwarted in the one object I had come for, a consent was given to his proposal; but before we had fairly got back to our quarters, a message was sent us, saying

that the passes into Kafiristan were not open just then; our reply was that in that case we should return immediately to India. He then sent for Sahib Gul, and eventually it was decided that I should defer my visit to the Kafirs till some of their leading men should arrive, and *ad interim* I might pay a visit to the Dura Pass. No European had hitherto been along this route, and thinking some information might be collected, and notes on the geography of the route taken, I agreed, though affecting disgust, and started on the 13th of May for Shali.

Andarhi was our next halting-place; the fort commands the entrance into the Arkari Valley; at the head of the valley are the three passes, Agzam, Khartiza, and Nuksan, over the Hindu Kush, leading into Badakshan, and a little below the Ozur Valley, which takes its rise from the Tirach Mir Mountain, whose elevation is deduced trigonometrically by Colonel Tanner to be 25,426 feet, presenting a magnificent view.

The dorsal ridge of the Hindu Kush has here a mean elevation of some 16,000 feet, and this great mountain of Tirach Mir stands on a southward spur from the main range from which it towers up thus 9000 feet above the latter. The head of the Dura Pass, which leads to Zebak and Ishkashim, is a little over 14,000 feet, the ascent being very gradual and quite feasible for laden animals; but owing to the people of Munjan and the Kafirs in the Bogosta Valley, traders prefer the route *viâ* the Nuksan Pass, which, as its name denotes, is much more difficult. Neither pass is open for more than three months in the year.

In this valley between Daroshp and Gobor, I noticed several detached oval ponds, evidently artificial, which I was told were constructed for catching wild geese and ducks during their annual flight to India just before the winter sets in, i. e. about the middle of October. The plan adopted, though rude, is unique in its way and is this:—By the aid of narrow dug trenches, water from the running stream is let into the ponds and turned off when full; the pond is surrounded by a stone wall high enough to allow a man, when crouching, to be unobserved; over and across one-half or less of this pond a rough trellis-work of thin willow branches is put up; the birds on alighting are gradually driven under this canopy and a sudden rush is made by those on the watch. Hundreds in this manner are daily caught during the season. The flesh is eaten, and from the down on their breasts coarse overcoats and gloves are made, known as *margaloon*. This method of trapping is borrowed from the Kafirs.

A short distance beyond the village of Daroshp are some mineral springs that are visited by invalids from Badakshan.

Having satisfied myself on my return from the Kotal by a visit up the Bogosta Valley that the descent into the Arnawai was not practicable for some weeks to come, I returned to Chitral on the 22nd of May. Some Kafirs had come in, and amongst them one who had just a year ago taken in to Kamdesh a Pathan Christian evangelist, who had unfor-

tunately given out that he was sent by the Indian Government, and that his masters would, if he gave a favourable report of them, come to terms with the Kafirs, so as to secure them in future against Mahomedan inroads. My visit occurred inopportunistically with regard to this statement of the evangelist, and although I stated that his utterances were false, the Kafir would have it that I had come on behalf of the Government; and that the Chief of Chitral had persuaded me into giving him the arms and sums of money I had brought for them. This Kafir next wanted me to pledge myself to aid their sect against Asmar, and on my refusing left my quarters in a pet, but returned after a couple of hours, saying that I might accompany him as doctor, and attend an aged relative of his.

Kafiristan embraces an area of 5000 square miles, bounded on the north by the Hindu Kush Mountains, on the south by the Kunar range; for its western limit it has the Alishang with its tributary the Alingar; its eastern boundary is not nearly so well defined, but taken roughly, may be expressed as the Kunar river from its junction with the Kabul to where the former receives the waters of the Kalashgum at the village of Ain; thence following up this last tributary to its source, a line drawn from that point to the Dura Pass is well within the mark. I may also include a small section occupying a tract north-west of the above-named pass, and subject to Munjan. There are three main tribes, viz. Ramgals, Vaigals, and Bashgals, corresponding with the three principal valleys in their tract of country; the last-named occupy the Arnawai Darra, and are divided into five clans, Kamdesh, Keshtoz, Mungals, Weranis, and Ludhechis. The Keshtoz, Mungals, and Weranis pay a nominal tribute in kind to the ruler of Chitral, but not so the other two clans. The Vaigal tribe are reckoned the most powerful; this probably is due to their occupying the largest valley. Each of the three principal tribes has a dialect different from the other two, but have several words in common, and as a rule have very little to do with those inhabiting the other valleys. The entire population is estimated at over 200,000 souls. Their country is picturesque, densely wooded, and wild in the extreme; the men of fine appearance, with sharp Aryan features and keen penetrating eyes; blue eyes are not common but do occur, but brown eyes and light hair even to a golden hue in combination are not at all uncommon. The general complexion varies to two extremes, that of extreme fairness—pink rather than blonde, and the other of bronze, quite as dark as the ordinary Panjabi. The cast of features seems common to both these complexions, but the fairer men if asked will indicate the dark men as having come from the south and that they themselves have come from the north and east. They are, as is always the case with hill tribes, short of stature; daring to a fault, but lazy, leaving all the agricultural work to their womenkind, and spending their days, when not at war, principally in hunting. They are passionately fond of dancing, in which both sexes

join, scarcely letting an evening pass without indulging in it around a blazing fire.

The dancing, which I on several occasions witnessed, was invariably begun by a single female performer appearing on the scene, and after going through a few graceful movements, a shrill whistle (caused by inserting two fingers into the mouth) given by one of the men is the signal for a change. Several performers then come forward, advancing and retiring on either side of a huge bonfire, at one end of which were the musicians—their instruments, a large drum, two kettle-drums, and a couple of flutes. To this music, more particularly to the beating of the drums, good time is kept. The whistle sounds again, when immediately the performers set to partners, if I may use the expression; after a while they disengage, and begin circling round the fire singly—men and women alternately. The tamasha ended by again setting to partners; each couple, holding a stick between them, their feet firmly planted on the ground and close together, spin round at a great pace, first from right to left and then from left to right. None objected to my taking part in this performance, but, for the indulgence, I had to pay as forfeit several strings of beads and shells, a few looking-glasses, and some needles, which I presented to those of the fairer sex only.

The houses are generally built on the slopes of the hills; the lower story is of stone, from 12 to 15 feet high, but is not used for cattle even, which are kept apart in stone byres. Timber is stored in these lower stories, as also the ordure of cattle, which is used as fuel, especially for smoking their cheeses. This cheese is made daily, and is of the nature of cream cheese, and when fresh is not bad. On the roof of this lower story, leaving a space all round to walk, rises the actual habitation, which is of wood entirely, and contains only one or two rooms; these are neat enough, but very dark. The door and door-frames are roughly carved with figures and scrolls. There is little furniture, but all use low wooden chairs or wicker stools to sit upon. The food, either bread, which is ordinarily of very thick cakes, but when guests are entertained of very thin broad cakes, like Indian chapatties, or meat boiled in a large iron caldron, is served in large deep circular wooden vessels, hollowed from a trunk or thick branch of a tree, without any table, though tables were seen occasionally on which drinking vessels were set. The bread cakes were served to guests, with slices of cheese between two such cakes, imbedded in hot butter. Their beds are very rude fixtures, consisting of poles, one end of which rests in the walls and the other on two legs: it is remarkable that they call them *kat*. The object of the lower story seems chiefly to raise the house above the snow in winter; it is ascended by a ladder outside, which can be drawn up. Sometimes there is a third story, which is, of course, like the second, of timber, but is also surrounded by a platform. The roof of flat stones, laid on beams and covered with mud.

The temples are square chambers of timber, with doorways carved and coloured; inside there are set several stones, apparently boulders from the river bed, but no images were seen, except those connected with funeral rites, which were temporarily set up in the temples. The use of these temples seemed to be chiefly in connection with funeral rites. The coffins were carried there and sacrifice performed before the bodies were carried off to the place of eventual deposit.

The men shave the whole of the head, except a circular patch on the crown, where the hair is allowed to grow, seldom, if ever, cutting it—never wearing a covering. Almost all the men I saw wore the Indian manufactured cotton clothes, similar to the Afghans, and on their feet had strips of hide tied with strings of hide. The dress of the women is merely a single garment, not unlike a very loose dressing or morning gown, gathered up at the waist. The hair, which as a rule is very long, is worn plaited and covered over with a broad cap with lappets, and just over the crown stick up two tufts (some have one only) which from a distance appear like horns. A sample of this head-dress as well as of three or four other articles of interest I have brought for exhibition to the meeting.

It is purely due to no blood-fends existing amongst themselves that they have succeeded in holding their own against the Mahommedans by whom they are hemmed in on all sides. They have nothing in common with them, and in fact are incessantly engaged in petty warfare with the Mahommedans. They are exceedingly well disposed towards the British: I may venture further and state that they would not hesitate to place their services, should occasion require, at our disposal, and steps might be taken to secure this. Slavery exists to a certain extent amongst them; this nefarious trade, however, would fall through if slaves did not command so ready a sale at Jalalabad, Kunar, Asmar, and Chitral. Polygamy is the exception and not the rule; for infidelity on the part of a wife, mild corporal punishment is inflicted, and a fine of half-a-dozen or more heads of cattle imposed, according to the wealth of the male offender. The dead are not buried, but put into coffins and deposited either in an unfrequented spot on a hill-side, or carried to a sort of cemetery and there left, the coffins being in neither case interred. I visited one of these cemeteries, and saw over a hundred coffins in different stages of decay; resting against the heads of some of these I noticed carved wooden figures of both sexes, and was told that this was an honour conferred only on persons of rank and note. As regards their religion, one Supreme Being (Imbra) is universally acknowledged. Priests preside at their temples, in which stones are set up, but to neither priests nor idols is undue reverence paid. Unforeseen occurrences are attributed to evil spirits, in whose existence they firmly believe, giving no credit to a spirit for good.

I have noticed that several mention the Kafirs as being great wine-bibbers. The beverage brought to me on several occasions was nothing more nor less than the pure grape-juice, neither fermented nor distilled, but in its simple form. During the season, the fruit, which grows in great abundance, is gathered, the juice pressed out, and put into jars either of wood or earthenware, and placed underground for future use. I obtained some, which I put into a bottle for the purpose of bringing away, but after it had been exposed to the air a short time it turned into a sort of vinegar. To the Kafir chief who took me in I offered some whisky, and poured out about half a wine-glass into a small Peshawar cup, but before I had time to add water to it, the chief had swallowed the pure spirit. I shall never forget the expression depicted on his countenance. After a while all he could give utterance to was, "We have nothing so strong."

Their arms consist merely of bows and arrows and daggers; a few matchlocks of Kabul manufacture have found their way into the country, but no attempts have been made to imitate them. At a distance of about 50 yards, with their bows and arrows they seldom fail to hit an object smaller than a man. The string of the bow is made of gut. Their wealth is reckoned by the number of heads of cattle (goats, sheep, and cows) they possess. There are eighteen chiefs in all; selection is made for deeds of bravery, some allowance also being made for hereditary descent. Wheat is their staple food, and from the juice of the grape they make a kind of bread, which is eaten toasted, and is not then unlike a Christmas plum-pudding.

To resume the narrative: once again, unaccompanied by my two friends, I left Chitral on the morning of May 23rd, and struck off from Urguch, spending the first night at Balankaru, in the Rumbur Valley. The people are the Kalash section of the Kafirs, inferior in appearance, manner, and disposition to their neighbours situated westwards; they pay a small tribute in kind to Chitral, and are allowed to retain their own manners and customs. To Daras Karu, in the Bamburath Vale, famed for its pears, I next proceeded; here also are Kalash Kafirs, and some Bashgali settlers. The valley is very narrow, and the cultivation restricted principally to terraced fields on the hill-slopes. Kakar was the next march; beyond it no trace of habitation. After a short stay we proceeded up the valley till dusk, and spent the first part of the night under some rocks. All beyond was snow, interminable snow. Starting at midnight for the head of the pass (the difference in elevation between our night's encampment and the crest was 7000 feet) it took us an hour to do every thousand perpendicular feet. The view on the Kotal as the sun was rising was a sight never to be forgotten; near and around us the hills clad in white with different tinges of red showing, and clouds rising in fantastic shapes, and disclosing to view the blue and purple of the distant and lower ranges. I was very fortunate in having a clear morning, as it enabled me

to bring my plane-table into great use. As the descent was very tedious, owing to the upper crust of the snow having melted under the rays of the morning sun, we decided on adopting a sort of "tobogganing" system by seating ourselves on the snow, raising the feet, at the same time giving the body a reclining position; a jerk, and then we were off, following in each other's wake, bringing ourselves up every now and again by imbedding our feet in the snow. By this means we got down almost to the base of the hill in a very short time, and on arriving at the Ludhe villages were well received.

The next few days, owing to the unfavourableness of the weather, going out was abandoned, but whilst thus inactive so far as going about went, my time was spent in examining closely into their manners and customs, when an urgent message was brought from the Aman ul Mulk, desiring me to return immediately, owing to some unfavourable news that was abroad. Thinking of my two friends, whom I had left at Chitral, being involved in some difficulties, I hurried back, only to learn that the chief had sent for me on the paltry excuse of having heard that the chief of Asmar and the Kafirs had begun their annual quarrels. So once again was another opportunity of penetrating further frustrated. During my absence on this trip that arch-fiend Rahat Shah had arrived at Chitral from India. As he has quite the ear of the ruler, all further chances of our getting on in the way of exploring were at an end, and so we decided on returning to India via Kashmir. In return for the presents we had given Aman ul Mulk when we first arrived at Chitral, he gave us others, and immediately after threw every obstacle in his power to prevent our getting away, and it was only on refusing to accept his presents that we were supplied with carriers.

Starting on the 5th of June, on the fourth day we arrived at Drasan (6637 feet). The fort of Drasan commands the entrance to the Turikho and Tirach valleys, whose waters meet a few miles north-west of the fort. Both these valleys are very fertile; in the latter one, and just before its junction with the former, are several yellow arsenic mines, but the working of these is not encouraged by the present ruler. Gold also, I was told, is to be found in the streams about Chitral; this statement proved correct, as I was able to work up some with the aid of mercury, and on having the ore tested by a goldsmith's firm in India, it was pronounced by them to be 21 carat; but this washing is seldom permitted, the reason assigned by the chief being that if once it were known that Chitral produced gold, his country would be lost to him.

Mastuj (elevation 7289 feet) is on the main or Chitral stream, and commands the entrance to the Laspur Valley, which leads more directly to Gilgit via Gupis and Gakuch, and was the route traversed by Major Biddulph. On reaching Gazan, we left the main route and followed up the smaller one along a stream taking its rise at the Tui Pass (14,812

feet). The ascent to it is easy, but the descent exceedingly difficult, a nasty piece of glacier having to be traversed, over which we were unfortunate enough to lose two horses, and had several of our followers severely frost-bitten about the feet. Two marches further and Gilgit was reached, and from there in eleven double marches we arrived at Srinagar, where my disguise was thrown off. To dwell on these last stages of our journey would be merely repeating what has been so ably handled by such authorities as Drew, Tanner, and Biddulph.

In conclusion, I would here record that whatever success has attended this undertaking is due in a great measure to my faithful companions and allies, Hosein Shah, Sahib Gul, and the Saiad.

The following discussion ensued on the reading of the above paper :—

Colonel YULE said he had for thirty or forty years looked with intense interest at the dark spot of Kafiristan on the map of Asia, and had therefore listened with great pleasure to Mr. McNair's modest account of one of the most adventurous journeys that had ever been described before the Society. Twenty or twenty-four years ago we had nothing but the vaguest knowledge of Kafiristan, but the country had been gradually opened out by General Walker and Colonel Montgomery's pundits in disguise. Foreign geographers had sometimes cast it in the teeth of Englishmen that their discoveries beyond the frontiers of India had been made vicariously, but in this case it was an Englishman who had performed the journey. He believed he was right in saying that no Englishman before Mr. McNair had ever visited the Swat Valley. It was now inhabited by a most inhospitable race, who had become Afghanised, but rumours had often been heard about the Buddhist remains there. Eighteen or twenty centuries ago it was one of the most sacred spots of Buddhism, filled with Buddhist monasteries and temples, but, as far as he knew, no European except Mr. McNair had ever seen those remains. If further explorations were carried out there probably most interesting discoveries would result. Passing on to the Panjkhora river and to Dir, there was very little doubt that those valleys were the scene of some of Alexander's exploits on his way to India. Many scholars supposed that Dir was one of the fortresses which Alexander took, and incidentally the place was mentioned by Marco Polo as the route of a Mongol horde from Badakshan into Kashmir. He believed that the earliest distinct notice of the Kafirs was the account of the country being invaded by Timour on his march to India. When he arrived at Andaráb he received complaints by the Mussulman villagers of the manner in which they were harassed by the infidels, and a description was given of how the great Ameer himself was slid down snow slopes in a sort of toboggan of wicker-work. He captured some of the Kafir forts, but could not penetrate into the country. After that very little mention was made of them in history, till Major Rennell referred to them in his great memoir on the map of Hindostan, and Mountstuart Elphinstone, who, the Afghans used to say, could see on the other side of a hill. He always seemed able to collect items of knowledge which further research proved to be correct. He (Colonel Yule) rejoiced that he had lived to see Kafiristan partially revealed by an Englishman and not by a Russian.

Dr. LEITNER said it was well that travellers, however naturally accurate in their observations, should submit their results to the criticism of learned societies, for, after all, it was in such centres that information from various quarters could be best collected, sifted, and compared. The task of a pioneer is proverbially ungrateful, but he is sufficiently rewarded if he collects facts for the examination of scholars, and if some

of these facts stand that test. On the other hand, it was essential that, as a rule, no one should be sent out on a geographical, anthropological, or ethnographical mission who was not something of a linguist or who was not accompanied by a linguist, and who had not given proof of sympathy with alien races. Hayward fell a victim as much to his temper as to the greed and treachery of Mir Wali, whom he had insulted. An Arabic proverb says that "the traveller even where he sees is blind," and if, in addition to this artificial blindness, he is practically both deaf and dumb owing to his ignorance of the language of the people among whom he moves, it is almost certain that he will make many mistakes, if not insure failure. Now few results are apt to be more delusive than a mere collection of words, or even of short sentences. The instances of "a dead policeman" as a Non-aryan equivalent for the abstract term "death" which the inquirer wanted; of the rejoinder of "what do you want?" for the repeated outstretching of the "middle finger," a special term for which was sought, and numerous other mistakes, are often perfectly avoidable, and it was therefore desirable that the traveller, armed with an inexhaustible patience, should not content himself with a collection of words, but also add the sentences in which they occur, and, if possible, also collect fables, songs, and legends. The process in dealing with a race whose language one does not know at all is more difficult, but, even in initial stages, the procedure of pointing to objects that are required will not only generally give their native equivalents, but will also elicit the orders or imperatives for these objects being brought, whilst the use of these imperatives by the traveller will often elicit the indicative or future in the assent or dissent of those to whom the imperatives are addressed, or else an ejaculatory affirmative or negative. The early training in, at least, two languages will also enable the inquirer to discriminate between the substance of a fact or thought, if he might use such a term, and the sound that represents it, for, if he has only studied his own language early in life, he will never be able to emancipate himself completely from the confusion which is naturally engendered between the idea and his special manner of expressing it. Adaptation, again, even more than translation, is what is required, and in order that the adaptation should be practised successfully, geographical inquiry cannot be altogether dissociated from philology, nor can philology be dissociated, as it so often is, from ethnography, history, and anthropology, which throw either a full light or at least a side-light or a half-light on linguistic problems, as has been pointed out by Dr. Abel. The gestures too of a race are of importance in eliciting correct information, for it is obvious that where, on rugged mountain sides, ascent or descent can only be practised by the aid of the hands as well as of the feet, the terms for "up" and "down" may be significant of surrounding topography, just as, to reverse the argument, where many meet only to fight, the putting of the fingers of both hands together will mean "collision," instead of its being the more usual sign for "multitude," or the limit of computation which a savage race may have reached. Finally, in this age of subdivision of labour on a basis of general knowledge, the present practice of explorers working separately without the co-operation of colleagues in the same or kindred branches, and sometimes even without a knowledge of the material that already exists, should be discouraged. The first step to be taken is the compilation of travellers' handbooks, dialogues, and vocabularies for the various districts of the so-called "neutral zone," so as to give to these travellers the key to information and to the sympathy of the people, and our Government of India especially might with advantage steadily collect both old and new information, not at the time *when*, but long *before*, an emergency arises, so that it may be dealt with a wealth of knowledge when it does arise. Had this view obtained when the "poor relatives of the European" were seen by Sale, Macnaghten, Wood, and others, thousands of Kafir men and women

would not have been carried into slavery by the Afghans, hundreds of Kafir villages would not have been destroyed, and the area of Kafir traditions would not have been both corrupted and narrowed by the broadening of the belt of "Nimchas," or converted Kafirs, which so increases the difficulties of an exhaustive inquiry into at least the *past* of an interesting race. Above all should we have had a faithful ally in our operations against Kabul, for even as it was, the tardy knowledge of that war by the Kafirs sufficed to bring thousands into the field ready to be let loose on their hereditary foe, whilst it put a stop, at any rate temporarily, to the internecine feuds, which, as much as Muslim encroachments, reduced the number of Kafirs. He hoped that the visit of Mr. McNair and of the native Christian missionaries recently in Kafiristan, might be another step towards the future union and civilisation of a race that, whether in part descended from the colonies planted by Alexander the Great or not, should no longer be treated as "poor relatives" by their European brethren, for whom the interposition of friendly and vigorous tribes of mountaineers, along with the Dards with whom they have so much in common, between the British and Russian possessions in Asia, cannot fail to be an advantage in the interests of peace. As to the various routes to and through Kafiristan, he would add nothing to-night to what had been so ably stated, but as regards the languages, he could not forbear mentioning that there are at least five distinct dialects spoken by the tribes, which differ as much as Italian does from French, if not from German, although based on Aryan roots common to them all. Their religious beliefs and customs also show great divergences as well as similarities. The members of various Kafir and kindred tribes, of whom he submitted a few photographs to the meeting, and whose measurements have been taken, have supplied an amount of information which may be laid before the Society in due course, along with, he hoped, a very full account of a neighbouring race that is anthropologically and linguistically perhaps even more interesting than the Kafirs, who are mainly Dards; he meant the people of Hunza (Hun-land?), whose language is, if not a prehistoric remnant, at any rate like no other that has hitherto been discovered, in which the pronouns form an inseparable part of numerous substantives and verbs, and in which gutturals are still in a state of transition to vowels. This people practise a code of religion and of quaint immorals fortunately confined to themselves, but which is not without some bearing on the question of the "Mahdi," now giving us some trouble in Africa. As some Kafirs call themselves "Kureishis," which favours a Shia notion in opposition to their Sunni persecutors, he might incidentally observe that the expectation of a "Mahdi" is a singular importation of a Shia notion, not entirely without our aid, into the orthodox Sunni Mahomedan world, which has so long been content with the *de jure* Khalifa, the Sultan, belonging to the category of "imperfect" Khalifas, as a chief and representative who is admittedly a "defender of the faith" only so long as he has power to enforce his decrees and is accepted by the general *consensus* of the faithful, the very essence of Sunni-ism, the "ahl-sunnat wa jamáat." This view is in bold contradiction to the *hereditary* principle, represented by the "Mahdi," of the "Imam's" descent from the Kureish tribe of Arabia, which caused the very separation of the Shia sect from the Sunnis, which is the very essence of Shia belief, and which has, among other fictions, led to the assumption of the name of "Kureishi" by some of the Kafirs.

Sir HENRY RAWLINSON was glad of the opportunity of expressing his high appreciation of the value of Mr. McNair's exploration. His journey was not a mere holiday trip, or an every-day reconnaissance survey; on the contrary, it was a serious undertaking, and opened up what he (Sir Henry) for twenty years had maintained to be the great natural high-road from India to Central Asia. The route to the

north of the Kabul river and along the Chitral Valley was by far the most direct and the easiest line of communication between the Punjab and the upper valley of the Oxus ; and although native explorers had, as Colonel Yule had observed, already traversed the route and brought back a good deal of general information concerning it, Mr. McNair was the first European who had ever crossed the Hindu Kush upon this line, or had gained such an acquaintance with the different ranges as would enable geographers to map the country scientifically, and delineate its physical features.—The seal which Mr. McNair had exhibited to the meeting was of Babylonian workmanship, and although relics of the same class were of no great rarity in Persia and Mesopotamia, it was a curious circumstance to find one in such a remote locality as the Swat Valley, and could only be explained by supposing it to have belonged to one of Alexander's soldiers who brought it from Babylon. Eldred Pottinger had found a similar relic at Oba on his journey through the mountains from Herat to Kabul. The tradition in the country had always been that the Kafirs whom Mr. McNair visited, were descended from Alexander's soldiers ; but there was not in reality the slightest foundation for such a belief. Neither in language nor religion, nor manners and customs, was there the least analogy between the Kafirs and Greeks. The various dialects spoken by the tribes of the Hindu Kush, including the Kafir tongues, were all of the Perso-Indian branch of the Aryan family, and showed that the mountains must have been colonised during the successive migrations of the Aryan tribes from Central Asia to the southward. It might perhaps be possible some day to affiliate the various tribes, when the vocabularies had all been collected and compared by a good philological scholar, but at present there was much uncertainty on the subject.—Colonel Yule had expressed his pride and satisfaction at Mr. McNair's success, and had congratulated the Society on the great feat of exploring Kafiristan for the first time having been accomplished by an English rather than by a Russian geographer. He (Sir Henry) would furnish a further source of gratulation by remarking on the fact that on the very day when Mr. McNair had related to the meeting the incidents of his most remarkable journey, intelligence had been received from the Indian frontier of another surprising geographical feat having been achieved by a British officer who was already well known to the Society, and who was, in fact, the chief of the department to which Mr. McNair belonged. He alluded to the successful ascent of the great mountain of Takht-i-Suliman, overlooking the Indus valley, by Major Holdich, of the Indian Survey Department. This mountain, from its inaccessible position beyond our frontier, and in the midst of lawless Afghan tribes, had long been the despair of geographers, but Major Holdich with a small survey party had at length succeeded in ascending it, and was said to have triangulated from its summit over an area of about 50,000 square miles. The Survey Department might well be proud of holding in its ranks two such adventurous and accomplished explorers as Major Holdich and Mr. McNair.

The PRESIDENT said that Mr. McNair agreed with Sir Henry Rawlinson that the route he had described would undoubtedly be the best into Central Asia, but the account of the journey did not inspire him (the President) with any confidence as to immediate results in the future. Mr. McNair had to disguise himself as a Mahomedan who was acceptable to the Kafirs, and it did not appear that he had in any way facilitated the entrance into the country of any one who could not conceal his nationality. The reports, furnished by native explorers sent from India, had, however, been fully established by Mr. McNair, and it would therefore appear that the best way of solving the problem was to send educated natives into Kafiristan. He was sure the meeting would heartily join in giving a vote of thanks to Mr. McNair for his interesting paper.

*Notes on the Geography of South Central Africa, in explanation of
a New Map of the Region.*

By ANDREW A. ANDERSON, Civil Engineer.

Map, p. 56.*

THE map which I have the honour to submit to the Society comprises the whole of South Africa north of the Orange and Vaal rivers to the Zambesi, and from the South Atlantic to the Indian Ocean (with the exception of some portion of the Transvaal, part of the east coast, and the country on the Lower Zambesi); a region which has been explored and mapped from my own surveys extending over a period of sixteen years, from 1864.

I commenced my explorations early in that year, north of the Upper Vaal river, originally for scientific purposes, in connection with geology, botany, ethnology, and such other objects of interest as might come under my observation more particularly relating to the native races inhabiting this extensive and almost unknown region. Not being able to procure any map of the country I intended visiting, the greater part never having been explored, I determined at once to commence a regular survey north of these two rivers, to penetrate the interior to the Zambesi, and take in the whole of this part of the African continent from sea to sea as circumstances and opportunities occurred. I provided myself with the necessary instruments for taking observations, in addition to those I already possessed, including in all, a common theodolite, prismatic compass, two aneroid barometers, an ordinary compass, a 6-inch sextant, pocket sextant, boiling-point apparatus, a trocheometer, and three thermometers. I proceeded in June 1864 to the source of the Vaal river, intending to divide the country into sections, but had to alter my plans in this respect, as the Boers of the Transvaal were strongly opposed to any survey being made of their country by an Englishman; I had therefore to use great caution and keep my work secret, not only from them, but also from the Kaffirs, and events afterwards proved the prudence of this resolution. Having plenty of time at my disposal, I was able to pursue my work systematically and carefully in connection with my other pursuits.

To describe each of the journeys I undertook would extend this paper to an unusual length; I judge it better, therefore, to give a general geographical outline of the various regions explored, such as will, I trust, sufficiently explain the topography of the extensive and interesting portion of Africa, at present so little known, which my map embraces.

* We limit ourselves to reproducing Mr. Anderson's map, which, it will be observed, leaves blank all parts which he did not himself explore, and have slightly reduced the scale of his original drawing, viz. from 40 miles to the inch to $57\frac{1}{2}$ miles.—ED.

The upper source of the Vaal was my first field of operations, taking in the numerous small branches which spring from the Quathlamba Mountains, in the eastern division of the Transvaal, now called New Scotland and Wakkerstroom district, and from Klip Staple, an isolated hill 6110 feet in altitude above sea-level, also from Lake Cressie at an elevation of 5813 feet. Ransberg, a part of the Quathlamba, at this point is 6800 feet, and in lat. S. $26^{\circ} 10'$, E. long. $30^{\circ} 32'$. From the source of this river, I followed its course westward. Being an important stream draining an extensive surface, I wished to make it the base of my operations, and proceeded as far as Potchefstroom, the capital of the Transvaal. Continuing west, I traced the river down to where Bloemhof now stands, taking in the country on the north up to the Vlei, the source of the Harts river, where Lichtenburg now stands, and completed the survey of that and the Vaal river, and the country between.

FROM THE VAAL TO THE GREAT FISH RIVER.

At this time, in 1865, I had to suspend my labours in this direction, the unsettled state of the country, the jealousy of the Boers, and the encroachments they were making on native lands, compelling me to turn my attention northwards, and after travelling twelve days over extensive grass plains which literally swarmed with game, I arrived at the eye of the Molapo river. Thinking myself secure from interruption, I explored the whole of that district, then commenced upon the river Molapo, which I found was the limit of the south-east corner of the Kalahara Desert, following its course westward, through an open country, uninhabited, in consequence of the scarcity of water, for eight months of the year, except in places in its bed, where water is obtained by digging.

I arrived at the great bend which the Molapo takes, in S. lat. $25^{\circ} 50'$, E. long. $21^{\circ} 16'$. At this point the name Molapo ceases, and the river runs due south and enters the Orange River at Kakamans Drift, under the name Hygap. The source of the Molapo is on the west slope of the great watershed, at an altitude of 5350 feet, in S. lat. $26^{\circ} 15'$, E. long. $25^{\circ} 55'$, where a plentiful supply of pure water flows throughout the year. It is the most important river entering the Orange below the Vaal on the north, in consequence of the many tributaries that drain the central and south Kalahara Desert, viz. the Nosop, Oup, and the Back rivers. In all these streams, whatever may be the quantity of water that may flow from the springs at their source, it is soon lost in the sand of their beds, from which it can be obtained by digging. From Kakamans Drift on the Orange, I completed the survey to the Harts river, and the country between that river and the Molapo. The Vaal enters the Orange about 50 miles below Hope Town; there the Orange takes a westerly course and falls into the South Atlantic.

From Potchefstroom in the Transvaal, which town is situated on the

Moi river about 20 miles north of the Vaal, in S. lat. $26^{\circ} 40'$, E. long. $27^{\circ} 34'$, to the west, between the Harts and that river, the country is entirely occupied by farms belonging to English and Dutch farmers. It is undulating, with rich open grass plains, and many salt and beach pans, where good salt is procured. Most of these pans are large, some six and seven miles round, others about two, and at some remote period they appear to have been always full of water to the depth of over 100 feet, but now never more than two feet is ever found in them: the formation is always limestone. There are several small spruits or streams that drain this district and enter the Vaal; some of the principal are Scoon, Maquassie, and Bamber.

There are several tracts of bush, the trees being mostly mimosa. The hills in the eastern portion are not extensive; at Klerksdorp there are several of igneous formation; at Setlakoola, the Swart Kop is a very picturesque range, and well wooded. Extensive districts contain fine slate and sandstone with mica. The country between the Harts and Molapo is more open; few farms, and those are within the boundary of Griqualand West. The rest is open Kaffir land, and thinly populated, except at the kraals, Sehuba, Towns, Kopong, Morequern, Honey Vlei, Kuruman, and many small kraals; extensive open plains extend in length upwards of 200 miles from the source of the Molapo; and there are also long stretches of bush and small mimosa trees. The other rivers, beside the Harts, that drain the country south of the Molapo, some of which are tributaries of the Molapo, are Setlakoola, the Moretsane, and the Kuruman; the two former rise in the high veld, the latter springs from a large fountain a few miles south of Kuruman, and passes through the desert to the west, entering the Hygap below the great bend: there are several small watercourses leading into this river. The limestone ranges of hills are extensive. The Campbell range commences near Towns on the Harts, and runs in a south-west direction to Campbelltown, on the Vaal. The Kuruman range from Kuruman to Griquatown, also of limestone formation. Langberg, a lofty range, commences south of the Kuruman river at Cowie, and runs due south to the Orange River. The Scheurberg, a peculiar and picturesque range from the many-pointed peaks, is 25 miles west of Langberg, the south end joining up to the Orange River: this isolated mountain stands alone in the open flat and barren desert. The different tribes living in this part of the country are principally of the Bechuana families, Griquas, Korunnas, and a few mixed races. The English towns on the Vaal are Klerksdorp, Bloemhof, Christiana, Hebron, and Barkly; the latter is in S. lat. $28^{\circ} 30'$, E. long. $24^{\circ} 41'$. Several of my longitudes have been calculated from this fixed point, which is correct. The country is very healthy and extremely dry.

The rivers that drain the central part of the Kalahara are the twin streams Nosop and Oup, appropriately called twins, as the two join

for 20 miles and again separate, both entering the Molapo close to the great bend; the Nosop rises in the Waterberg of Damara-land in two head-waters called the Black and White Nosops, which join north of Westly Vale and join the Oup at Narukus. The Oup rises in Damara in lat. 22°, under the name Elephants river, and gathering the waters of other small branches, joins the Nosop at Narukus for 20 miles, then becomes an independent stream, and falls into the Molapo. Several shallow watercourses traverse the desert, but are not of sufficient importance to merit a place on the map. Water remains in portions of these rivers in pools throughout the year. From December to May, the rainy season, water is plentiful; at other times it can be obtained only by digging in the beds of the rivers. At Meer, a Bastard station, there are two large pans, with permanent water. These people, descended from the early Dutch Boers and Hottentot women, have established themselves at Meer, and formed a kind of petty republic, which is daily increasing in importance, and when more powerful will give trouble. Their servants are the Bushmen of the desert, which they forcibly take as slaves. Dirk Philander is their magistrate, and holds his court once a week; I attended several. They are so far removed from the colony that they find they can do as they please.

Twenty miles south of Meer is an extensive vlei, called Hogskin, in length 33 miles, and at the south end there are two fine conical hills, which are very prominent objects, visible 60 miles off, and as they stand alone, surrounded by bush and the vlei, they add greatly to the beauty of the landscape. The highest is 415 feet high from the base, and as I made it one of my principal trigonometrical stations, having so commanding a view, it was an important point for my triangulations. There are three small rivers that feed Hogskin Vlei, viz. the Snake, the Moi, and the Knaas. After heavy rains the vlei is full, and forms a fine sheet of water, which it retains for some months, but it is frequently dry; wild fowl and game frequent it in the rainy season. Near these two conical hills, which are called Base Kop, I obtained several good specimens of coal from the banks of the rivers and also from the side of the hill. About 20 miles to the west, slate and shale form the beds of the rivers Snake and Moi, and on the Knaas river is a conglomerate of limestone, greenstone, and garnets. Some specimens of these rocks I sent to Mr. Southey, when Lieutenant-Governor of Griqualand West. This part of the desert is full of bush, kameel, dooms, and other trees, and is diversified by long, low ridges of sandstone, limestone, and many low hills of granite. During the rainy season vegetation is splendid, and the grass fine and plentiful, consequently game is abundant; it follows as a natural consequence that lions, leopards, and many other species of feline animals are numerous. This is truly the lion veldt; I have counted at one time in a troop, great and small, twenty-two individuals, frequently six and seven in the middle of the day, and

within a short distance from my waggons, on their way to the water, near which I have been outspanned. This country was formerly also the great ostrich district; I have seen over two hundred in a troop, early in the morning, but they soon scampered away on seeing my waggons; they are now fast disappearing, under the Bushman's arrow and the huntsman's rifle, but the great loss is in their eggs, felt by all who visit that region. This desert has been considered an uninteresting and barren waste, but it is not so; there are portions, it is true, that cannot be traversed during the dry season, several who have attempted to penetrate it having been obliged to come out and leave their waggon, their oxen all lost for want of water; but this was in a great measure their own fault, for if they had followed up the rivers and dug in their beds, they would have obtained it. There are many miles of limestone flats, some extending 10 miles in length, bounded by sand-dunes and isolated koppies, with their pointed summits covered with bush. The rolling plains and bush-covered low hills, with the distant mountain peaks that bound the horizon, the perfect calm and silence that pervade everything around, the variety of game seen in all directions, the very loneliness of the position, being at least 250 miles from any white man, surrounded by a few families of the Bushman tribe, who now live in all their natural innocence, as their forefathers lived in prehistoric ages, add immensely to the pleasure one feels in viewing a scene so novel and so seldom to be enjoyed.

The most peculiar feature in this region are the sand-dunes, mentioned above. These dunes extend for many miles in every direction; they run due west and east, and in altitude from 50 to 200 feet. Their base is a dark limestone covered with sand, which varies in thickness from four to ten feet. Their sides are at an angle of about 30°, and the topmost ridges so pointed, that when a waggon and span of eighteen oxen arrive towards their tops, the whole span is descending on the other side as the waggon reaches the summit, and the driver on the box can only see the four after oxen; but from the great depth of sand in the road, the waggon glides down with ease, although going at great speed. To illustrate more clearly the shape of these dunes, I can only compare them to a very stormy sea, with gigantic waves, instantly turned into sand; many small trees and bushes grow on their slopes, and also beautiful grasses. From six to eight miles a day with an ox waggon is considered a good trek. There are some small fountains and vleis in some of the hollows, otherwise no one could pass that way, as the road over these dunes from first entering them is 30 miles, then a flat of 8 miles over limestone and sand-dunes again.

There are also many isolated conical granite hills, that rise from the level plains to an altitude of 200 feet, formed of huge blocks, which can be seen at a great distance; they more resemble artificial than natural

monuments. I found them of great service in my triangulations; the atmosphere being so clear and dry, objects at great distances can be distinguished. There are many of these pyramidal hills in the southern part, near which my base line was laid down, in length 10 miles at first, but I increased it to 42 miles on the open plain, both ends terminating at elevated points that could be seen at long distances, and being on the meridian.

The Back river commences in a range of the Brinus Mountains, of granite formation, a most picturesque group of lofty hills, well wooded in the kloofs and ravines. The peculiar feature of this river is that it has two outlets, one to the east into the Hygap, the other to the west into the Great Fish River. Several small kraals are on its banks, occupied by various tribes. South of this river, and between the Hygap and Fish River, three mountain streams drain the southern Kalahara, viz. the Nisbet, Aamo, and Keikab, which fall into the Orange. This district is also of granite formation. This part of the country is good for sheep and goats, and large flocks are raised yearly, and soon get fat from the Karroo bush that grows on all the lowlands. Rain seldom falls, and the country is very healthy. The people comprise nearly every tribe of South Africa.

THE GREAT FISH RIVER AND GREAT NAMAQUA-LAND.

The source of this river is in Damara-land, S. lat. 22° 40', at an altitude of 6400 feet; it flows south, and enters the Orange River about 90 miles from its mouth. The country through which it flows is very dry from the scarcity of rain. There are no important streams on the east, but on the west there are many tributaries that drain the high mountain country: the largest is the Amhup. The geological formation is granite, gneiss, trap, and amygdaloid. From the magnitude of this river it is evident the country at one time must have been well supplied with rain, as it is a deep, broad, and stony stream, showing how rapid and deep must have been the flow of water down it. There is another small river on the west coast, the Little Orange; its source is in the highlands, and it enters the South Atlantic at Angra Pequena Bay. The coast-country is a sandy desert, the sand forming steep ridges, extending 70 miles inland, until they join the mountain slopes. Wood is plentiful in the kloofs and on the hill-sides; some of the mountains are very bold, some exceed 8000 feet in altitude. Upon this river and its tributaries live the tribes called the Veldt scoondrawers and Bundleswaarts, who are distinct from their neighbours the Hottentots, Korunnas, Bastards, Kaffirs, and Bushmen. Some of the former cultivate land, use the plough, and keep cattle and sheep; they live near the small fountains and along the river banks, where they procure water by digging in the beds of the rivers, and roam from place to place as water fails. The tribes live under petty captains; there are several

mission stations, Bath, Bethany, Bethesda, and others. Copper is found in many parts of the country, and copper mines are worked in the south near the Orange River, which is the southern boundary; the Kalahara is the eastern boundary, Damara the northern, and the Atlantic the western.

THE RIVER SWAKOP AND DAMARA-LAND.

The Swakop river and its tributaries, including the Kennop, drain the greater part of this country. This river rises in the desert as far east as 17° E. long., and flows west and enters the Atlantic in Walfish Bay in S. lat. $22^{\circ} 45'$, and E. long. $14^{\circ} 33'$. The upper portion passes through a fertile country and between lofty hills of granite; some of them exceed in altitude 8900 feet. The lower portion passes down through a sandy and barren waste. The mountain regions are more thickly populated than the lower lands. The eastern portion has extensive grassy plains, and portions well wooded, particularly in the kloofs of the mountains. The mineral wealth of these parts is little known, but from the slight inspection I was able to make, and the specimens I obtained, I believe it will be found to contain lead and copper. Copperworks were established many years ago on the Canna river. The other rivers of less note are the Kuisip, south of the Swakop, which drains the country between Great Namaqua and Damara lands, from the eastern mountains at an altitude of 8000 feet. The other rivers north of Swakop, and which drain the western division, are the Omaruru, and four others to the north, which I have not been able to explore. Their sources are in the high tableland and mountains to the east, which average in altitude from 2300 to 4500 feet, but water never flows in any of these rivers, except in very extraordinary rainy seasons. The south-east boundary is drained by the Black and White Nosop and the Elephants river, which I have previously described. The eastern division is drained by the Omuramba, passing through a thick bush country and open grass lands, upon the banks of which there are many kraals, then turns east through an open country, uninhabited, and south enters the Nosop. This river is more properly a laagte or shallow water-course. The coast-line extends as far north as the Cunene river, which is also the Portuguese boundary, and southward to Walfish Bay; and for 70 miles inland, as far as I have been, it is a sandy desert, similar to the coast-line of Great Namaqua. The Damaras live on the open plains, and along the springs and watercourses. I have not been able to obtain any statistics of the number or variety of the tribes, not having explored the whole of that region. The Damaras and Berg-Damaras both speak the Otjiherero language. There are many other mixed races spread over the country, and great numbers of cattle, sheep, and goats are kept by them. The produce of the interior consists of ivory, feathers, skins, and other articles, which the traders purchase,

and ship at Walfish Bay. Several mission stations are established in the country. In 1875 the Cape Ministry decided to annex Damara-land to the Cape Colony, and Mr. Palgrave was appointed, and His Excellency Sir Henry Barkly recommended that I should be Mr. Palgrave's co-adjutor. The Ministry demurred at the expense, therefore Mr. Palgrave was sent, and after much trouble and delay, Walfish Bay has been added to the Colonial possessions.

OVAMPO-LAND.

This extensive region is situated to the north of Damara-land; its eastern boundary is the Kalahara desert, and on the north-west the river Cunene and the Portuguese settlements form its limits. The high tableland extends over the whole of this region, and is exceedingly healthy, the highest altitude being 5300 feet, as far as I have been able to take them. The Ovampos have large herds of cattle, sheep, and goats, and cultivate corn extensively. The people are very black, finely proportioned for strength, and are hard-working and industrious. They speak the Otjiherero tongue, and are very jealous of strangers. The only other river not yet described that drains Ovampo-land is the Ovampo laagte, which commences on the west of the central watershed, at an altitude of 4200 feet, and in S. lat. $19^{\circ} 20'$ and E. long. $18^{\circ} 56'$, then passing north-west, through the Great Salt Vlei, it falls into the Cunene river, and thence to the Atlantic. The country is said to be rich in minerals, but my time was so fully occupied in exploring and taking observations, that I could not devote any attention to the search, and the natives besides were suspicious as to my movements. Ovampo-land is one of the most beautiful portions of this part of Africa; picturesque mountains, lovely open glades, well-wooded districts, a rich soil for corn, a dry and healthy climate, make it a desirable country to live in. But time was of consequence: and I was anxious to finish my work during the favourable season. I left Otabengo on the 10th of September, 1869, and proceeded along the laagte called Okayanka, which passes east and enters the Tonka; it rises in S. lat. $17^{\circ} 48'$, E. long. $17^{\circ} 50'$. At Chambombo Vlei, between this and the Ovampo river, we cross the great watershed. Game of every kind is to be found here, the elephant, rhinoceros, giraffe, eland, sable antelope, gemsbuck, and a variety of other kinds of antelopes, the ostrich, zebra, buffalo, wild hog, &c. Leaving Ovampo in a north and north-east direction through the Batibe country, by slow stages along the numerous pans and vleis, hunting on the Okayanka laagte, to rest and obtain specimens of the flora, which is particularly rich in the variety of the plants, and also some rare geological specimens, I proceeded on the 2nd of October, travelling 70 miles with little water, and arrived at the Cubango; the country was difficult to travel, in consequence of the thick bush and timber, but there are large open plains, with palms and baobab trees

standing out, the giants of the forest, and other tropical trees and plants. I halted at a small village of the Kásáká Bushmen, which I named my station, and from this point I followed up the river. But before proceeding further, as I am now in the northern regions of the great southern desert of Africa, I must describe its extent, position, and boundary, and then complete my account of the river system which drains it.

THE KÁLÁHÁRÁ DESERT.

Noting the pronunciation of the Bushmen when naming this desert, I have spelt it accordingly, and believe it to be correct. The spelling corresponds with Námáquá, Dámárá (Sáhárá of the north), Mákárákára Salt Vlei, Mákálákára pits, and many others. The boundary of this vast and interesting region comes down south to the Orange River, S. lat. 29°, which is also the northern boundary of the Cape Colony, and extends north to the 16° S. lat. as far as my explorations went, with the exception of the river Cubango, up which I ascended to 15° S. lat. The western boundary is formed by Great Námáquá, Dámárá, and Ovampo lands. On the east, it is bounded by the river Chobe to the Zambesi and Victoria Falls, then due south, it skirts the eastern bank of the Great Mákárákára Salt Vlei, where five streams enter it from the watershed, viz. the Nata, Quabela, Shuarí, Mia, and Tua; thence the boundary runs south to the Mákáláká pits, a few miles to the west of Mongwato station (this station is very seldom called Ba-Mangwato), from those pits due south to Molopololo's, on to Kanya, and Maceby's station on the Molapo, down that river to Conge, Honey Vlei, on to the north point of Langberg range of mountains at Cowie, down that range south to the Orange River, a few miles above Kheis. The length of the Kalahara from north to south up to 16° is 900, and to Kabano on the Cubango 970 miles, but from information obtained from the Kásáká Bushmen on the spot, I believe it extends much further north. The greatest breadth is about 500 miles, from east to west. There are only two more rivers to describe which rise or flow through the region, viz. the Chobe and the Cubango, besides Lake Ngami and Zouga river. The Chobe rises much beyond the point surveyed, viz. in S. lat. 16° 35', E. long. 21° 37', where another branch enters it; from this point the Chobe takes a winding course through a level and swampy country, full of jungle, past a Kaffir kraal, Matambaya, to within 70 miles to the west of Linyanti, past that chief's kraal, in an easterly and north-easterly direction; it enters the Zambesi 37 miles above the Victoria Falls. The Chobe is a large and broad river with several rapids. There are many streams and laagte which intersect this extensive and swampy region, but like the Mábábe, water seldom flows in them. It is a most unhealthy and sickly country, whence it has obtained the name of the Fever District. Extensive tracts are uninhabited; some of the natives

build their huts on piles near the streams, and when the Mábábe is full the hippopotami visit it from the Chobe, and the Kaffirs come in their canoes to hunt them. The scattered races who live in these parts and along some of the vleis and pits are the Makuka, Banyeti, Bakana, Batilutie, Luinas, Barotse, Mákalaka, and a few Bushmen. Laagtes, pans, and vleis are found in every direction.

The Cubango River.—The source of this river is much further to the north than my explorations extended. I followed it up to about the 15° S. lat., from my station on the river at a Bushman kraal, S. lat. 17° , E. long. $19^{\circ} 56'$, at an altitude of 3370 feet above sea-level; from that station the river runs in a north-west direction for 80 miles, then turns a little east of north for 30 miles, where there are two branches, one continuing in a north-west course, the other almost due north to a Bushman kraal, with a few windings for 53 miles, passing through a thick forest and bush. From my station the river, downwards, flows in a south-east direction for 55 miles to Libebe kraal, then in an easterly course winding through the desert for 65 miles to Debabe's kraal, S. lat. $17^{\circ} 22'$, E. long. $21^{\circ} 30'$, where the altitude is 3150 feet. At this station it turns south, and receives a new name, the Tonka, continuing with many turns and windings for 220 miles, finally entering the north-west corner of Lake Ngami at an altitude of 2813 feet above sea-level, in S. lat. $20^{\circ} 25'$, E. long. $24^{\circ} 45'$; in its course there are several falls and rapids, i. e. when it has water in it. The general configuration of the northern Kalahara, between the Chobe, Cubango, Tonka, and Ovampo and Damara lands, varies in character. Between the two former rivers the region is flat, and full of swamps; to the west it is undulating, with a gentle rise, until it forms the central watershed. The greater portion is thick bush; there are also extensive open plains, with dry laagtes crossing them towards the east. Large and small game abound. The greatest altitude of this region is 4320 feet, viz. on the watershed in Ovampo-land. South of Lake Ngami, a range of hills, called the Makkapolo, stretches in an easterly direction, which to the south-east are 4010 feet in altitude, 40 miles to the south-west of the lake 3500 feet, but continues rising towards the west until it attains 4000 feet on the watershed. All the rivers on the western slope flow into the South Atlantic, those on the east into the Indian Ocean. The usual tropical trees grow throughout this region, and many beautiful shrubs and flowers. From the elevated positions, fine views can be obtained of distant land which is most favourable for observations. The produce of the country is collected by the hunters who visit the country from Damara-land and the lake, and also by some few Portuguese who occasionally visit it. Bushmen are the only permanent inhabitants: the Mesere, Kásáká, and the Kaikairibrio families, who live in caves and hills and small kraals, in the bush. Some of the Batibe tribe live at Serela and other kraals. Many of the border tribes go in to hunt, but do not remain; they may be seen

occasionally in small parties traversing the desert with one or two pack oxen, loaded with dried game and such feathers they may have obtained by the rifle or stolen from the Bushmen they may have surprised. In my journeys through the desert, I was always accompanied by several of these Mesere Bushmen and their families, which was a great help, as they took me to watering-places unknown to hunters, and were my guides in places I should not otherwise have visited. I found that if you treat these people well, they are willing to assist in any way. They are a small race, seldom exceeding four feet ten inches in height; when old, which is at the age of forty, they are very ugly. Their food consists of game, which they kill with their bows and arrows, eggs, roots, mice, locusts, insects, the large black frog, which measures a foot across the body, and land turtle, besides any filth they may pick up. When I was in this region in 1872, I wrote to His Excellency Sir Henry Barkly, then Governor at the Cape, describing these people and the tortures they suffered from the border tribes, and the slavery carried on by them; but these things will be fully explained in the work which I am completing.

The main transport road from Walfish Bay to Lake Ngami, through the desert, is not the only road; there are many traversing it in all directions, made by hunters, traders, and such natives on the border as possess waggons.

The eastern division commences at Lake Ngami. This particular region requires some explanation as to the altitudes of the various sources of the different rivers that occupy the northern portion. I found the heights given by other explorers somewhat erroneous and therefore paid particular attention to this branch of my work. The great test was at Lake Ngami, Mákárákára Salt Vlei, and the junction of the Mábábe with the Chobe, which gave at all these three points the same altitude, within a few feet, by the aneroid barometers; and the proof of these levels at these stations was, the level of the water at the same time being the same, viz. 2813 feet. Lake Ngami is 45 miles in length; on the eastern side the Zouga river joins it, sometimes flowing into it, and sometimes out; the direction of the current depending on the rainfall. The Zouga from the lake winds easterly through a flat country, and joins the Mákárákára Vlei; the Zouga having such a perfect level, the water in April and May flows easterly, in June and July westerly. The only outlet for the surplus water of the Zouga, lake and vlei, is the Mábábe into the Chobe; and when all are full and no stream flowing, the water in the Mábábe goes north or south according to the rain. If a great rush of water comes out of the lake or vlei, the Mábábe is the outlet which connects the lake system with the Zambesi. The Mábábe in the dry season is a laagte or dry watercourse; gigantic trees grow on the more open flats, and the palm, mopane, and other tropical trees and shrubs.

The rivers Daka and Zimboya fall into the Zambesi about 70 miles below the Victoria Falls, the altitude of the falls being 2580 feet. South

of the falls there is a range of hills running west and east to the river Gwaii, the highest point being 3900 feet, which is on the east of Daka. From its southern base the land gradually slopes to the south until it reaches the Great Vlei and the Zouga river, at an altitude of 2818 feet. The country is deep sand; the sickly season is from September to May. South of the Zouga down to the Molapo river, the land again rises until it forms the central watershed at an altitude of 4260 feet. The whole of this part of the desert is thick bush, but scarce of water in the dry season. There are some permanent pits and small vleis; the larger pans hold water only in the rainy season. The principal inhabitants are the Bushmen, and some of the chiefs, such as Khama, Sechele, and Gaseitsive's, are Kaffirs, who live at permanent watering-places and have many kraals within their respective boundaries. A large portion of this part is claimed by each chief.

The mountain range dividing this eastern portion from the western part of the desert, commences about 100 miles south of Lake Ngami, taking a southerly course to the Molapo river, in a line with Langberg, before described.

The principal inhabitants near Lake Ngami are a branch of the Bechuana family, Makalaka, Korunnas, Bushmen, Hottentots, and a variety of other races, all living under the young chief Molemo, son of Leshulotabes, whose kraal is on the east side of the lake. There are several petty chiefs living on the river.

The great watershed of South Central Africa, dividing the waters which flow into the South Atlantic from those flowing into the Indian Ocean, commences much beyond the limit of my explorations. At the point where I took it up the altitude was 4100 feet; from there it takes a diagonal course across the desert in a south-east direction, at various elevations, as given on the map, to Lichtenburg, a town on the western boundary of the Transvaal, where the altitude is 6100 feet; from that town it takes a turn to the east, running between Potchefstroom and Pretoria on to Lake Cressie (6300 feet), then it suddenly bends to the south-west along the Drakensberg range, forming the western boundary of Natal, down to the Giant's Castle, where the altitude is 10,000 feet above sea-level.

The watershed between the Zambesi and Limpopo basins commences in the desert at Káikái (4260 feet), striking north-east, passing east of the Great Mákárákára Vlei along the tableland, past Gubuluwayo to Sakaloto. At that point the altitude is 4210 feet; the highest point reached was 4800 feet.

THE EASTERN DIVISION OF SOUTH CENTRAL AFRICA.

Having described the western division of this part of the continent, it will be necessary to explain the geographical features of the eastern, comprised within the map.

The Limpopo river, sometimes called the Crocodile, the source of which is on the northern slope of the great watershed, south of Pretoria in the Transvaal, flows in a north-west course to Marico, thence north to the great bend, where the river makes a turn to the north-east and east to E. long. $31^{\circ} 56'$, then turns south-east through a very flat country, and enters the Indian Ocean. Many important rivers (tributaries) flow into it, draining an extensive surface. The southern tributaries are not surveyed or properly explored, therefore I have not shown them. I take only the western and northern branches, viz. the Great and Little Marico, the Notuane, the Makalapsie, the Setuane, the Serubie, the Pakwe, the Maclutsie, the Shasha, the Mekhoe, the Rubie, the Nuanettie, and their several tributaries, which drain the country on the eastern side of the watershed.

The Great Marico rises in the Marico district of the Transvaal, where the Little Marico and Molmána rivers enter it above. The Molmána in its course forms large vleis, one below the other, where the hippopotamus a few years ago could be found; now they are the retreats of the python, which attains great size: I shot one 16 feet 2 inches in length and 2 feet 4 inches round. The eye of this river is only distant from the eye of the Molapo ten miles, the central watershed dividing them. The Great Marico turns north and enters the Limpopo, lat. $24^{\circ} 15'$, altitude 2690 feet. This river drains one of the finest and most valuable portions of the Transvaal, both as an agricultural and mineral district. Quartz-reefs cross it in every direction—lead, copper, and gold. A lead mine is now being worked by an English gentleman, who can turn out several tons of lead per day, and the proportion of silver to the ton is found to be 50 ounces.

The Notuane river is the next tributary of the Limpopo, and is an important stream, in consequence of its passing through a rich agricultural and mineral district, occupying an extensive area; the part adjoining the Transvaal is farmed by English and Dutch farmers, the other parts belong to four Kaffir chiefs, living at Rinokano, Ramoocha, Kanya, and Molopololo. One principal branch rises near Zeerust in the Transvaal; the other, in the desert, with many small branches and fountains falling into them, supplies the country with sufficient water. The country south of Koloben to the Transvaal boundary is exceedingly fertile, and produces superior corn crops, and extensive herds of cattle, sheep, and goats. All vegetation seems to thrive and arrive at perfection. This district is intersected by lovely mountains, well wooded, and park-like valleys; the roads good and level; tropical plants grow wild on the hills and plains. The winters are mild, and it is a most healthy district; under an industrious white population it would become one of the richest portions of South Africa, as it is now the most beautiful, and would support a population five times greater than the present number of Kaffirs living there. In the mountains near Ramoocha,

the kraal of the chief Macose, gold is found, and in many other parts I believe it exists. I have found copper, lead, plumbago, and most valuable earths. Iron of the best quality is found at nearly every turn; the natives manufacture their picks from it. Some ancient furnaces still exist in the mountain kloofs where copper was smelted. The natives will not allow the country to be properly prospected, but when the country up to the Zambesi is annexed to the British crown there will be no difficulty in properly developing its resources.

The chief Khama and the rivers in his territory are to the north of the Notuane. Khama's head kraal, Mongwato, is situated partly in the bed of an ancient river and in the kloof of the mountains, which formed a tributary of it; from which and from a small brook running through the centre of the ancient river, the natives obtain their water, the brook falling into the Limpopo; it is too small to note here, but is shown on the map. North of Mongwato is the first important river, the Makalapsie, then follow the Setuane, the Maclutsie, and the Shasha, with their several branches, the latter river being the boundary of Khama's country on the north. They take their rise from the eastern slope of the watershed which divides the Zambesi and Limpopo basins, and fall into the Limpopo, passing through a dense bush, and between lofty hills of granite formation. This country is called Doorst-land, from the dryness of the district; but vegetation thrives, although no rain falls from April to November, and frequently not until the end of December: grass is plentiful, and trees and bushes do not seem to suffer. Water is seldom found in the rivers, except by digging. In the rainy season most of the rivers are full, and come down with great force. The consequence is, this district is not inhabited by any of Khama's people, as they can find more suitable locations elsewhere. Kaffir posts are on the Makalapsie, and from that river north to the Shasha, a distance of 100 miles, only a few Bushmen are to be found, who have to shift their quarters as the supply of water decreases. There are several mountain ranges passing through, and in detached bergs; some granite, others metamorphic, gneiss, oolite, and slate. This chief's territory is very extensive, and extends up to the Zambesi Falls.

Lo Bengulu, the Matabele king, endeavoured a few years ago to claim all that part of the country even as far as Lake Ngami, and sent an army in to clear the region of all the cattle. They penetrated some distance, and swept away many hundred head, but have never been in since, and Khama has the country, and rules the people in it, and grants to white hunters permission to hunt, the boundary between these two chiefs being the river Shasha up to the Tati junction, up the latter river, and then the waggon road to Daka and Victoria Falls. Khama's kraal was formerly called Shoshong, and sometimes Ba-Mangwato. His tribe belong to the Bechuana family; the northern part being inhabited by the Makalaka, Batletle, Barutse, and others, besides

a few Bushmen. Large and small game of every kind is to be found in this region. In the southern portion, but more particularly in the Kaffir ground by the diamond-fields, many ancient carvings on the rocks are to be met with, representing animals, snakes, and men. I have a sketch taken from a large igneous rock, of a landscape, with figures, and a snake in a tree giving a ball or some kind of fruit to a figure standing near; the implement used to cut the figures must have been very hard. This rock stands on one of the tributaries of the Limpopo. I have nearly 200 drawings of these carvings.

Matabele-land and the Mashona country extend to the Zambesi, and as far east as the Sabia river and Umzila's country. The principal rivers and tributaries of the Limpopo that drain this region on the south side of the watershed are the Shasha, Tati, Ramakaban, Mpakwe, Meksine, Rubi, and Nuanettie. The eastern part is drained by the Lundi, the Tokwe, and the Sabia rivers, which fall into the Indian Ocean, south of Sofala; all these rivers rise from the southern base of the watershed, which is of granitic formation. Many of the spurs stand out in bold and picturesque forms, and in isolated koppies formed of immense granite rocks, in grotesque positions, to the height of several hundred feet, from which grow fine and beautiful trees, shrubs, and flowers, greatly increasing the beauty of the landscape. Gigantic baobabs, palms, euphorbias, aloes with their crimson flowers, and other tropical trees skirt the hills and mountain streams. The fallen masses of rock from the pyramid-shaped hills, give a strange and peculiar feature to the scenery around. This country gradually descends towards the south and east, until it reaches the Limpopo and Sabia, interrupted by isolated hills and mountain ranges, thickly wooded; the most inaccessible points being selected by the Mashonas for their kraals, to be secure from any surprise of the Matabele warriors. The population of the eastern division is mostly composed of the Mashona tribe and Banyai, as well as the Makalakas; the southern part by the same races, and many of the Makloes, Makatse, and Mantatees, that have crossed the Limpopo from the south side. The Tati gold-fields occupy the western border; the whole of the lower portion of this region is called the Makalaka-land. Gold is found in many of the rivers, and also in quartz, but no one is allowed to prospect. There are many large military posts on the slopes of the watershed, down to Makobi's post, which is their frontier outpost. Although the Matabele country comes down to the Shasha river, no one occupies that district except a few wandering Bushmen. There are many ancient forts, the ruins of which are still to be seen on commanding positions, but none of any great extent; they have been built of hewn stone; the most perfect I have sketched and made ground-plans of: many are so concealed from view by trees and bush, that it is by mere accident they are discovered. Along the Sabia, Lundi, Manica, and at many other places, they are to be frequently met with. The

natives state they were built by the white men that once occupied this country, whom they called *Abberlomba* (men who made everything); the stone used was granite, and hewn into blocks, without mortar, but many had concrete floors. The rivers on the north slope of the watershed in Matabele-land are tributaries of the Zambesi, rising in the mountains on that granite range, and with their many and important branches drain an extensive area. The first is the Gwaii. The altitude of the source of this river is 4800 feet; the rivers falling into it are the Inkokwasi, Umvungu, Chamgani, Kagane, Umkhosi, Kame, Mapui, Amatza, Amabogwana, and Umfulamokokgumale, which supply the country with water, upon which are situated many of the most important military kraals, viz. Amabogwana, Inyatine, Umkano, Umganine, Umhalbatine, Umslaslantala, Gubuluwayo, Umgamala, Umlambo, Umshangiva, Manpangi, Mthlathlagela, and many others. The Gwaii enters the Zambesi in S. lat. $17^{\circ} 54'$, E. long. $27^{\circ} 3'$, passing through the Abutua district, which is thickly wooded, and has few inhabitants. The next rivers are the Umnyaki, the Umvule, and the Mazoe, and their several branches. The country is very hilly, clothed with dense bush towards the Zambesi, but having no Kaffirs beyond the slopes of the watershed. Corn, rice, and vegetables are grown by the Mashonas, and more to the east cotton is cultivated and manufactured into blankets and other clothing. There is also a wild cotton, called *olundly*, but it is not used, except for tinder. The country is similar to that on the south side of the watershed. The altitude of this range averages 4320 feet; many old gold-diggings are to be seen along the slopes of the hills, where quartz crops out, and the country has every indication of having in some remote period been extensively worked.

The Mazoe river rises in S. lat. $17^{\circ} 56'$, E. long. $32^{\circ} 20'$, at an altitude of 4210 feet, and flows in a north-east direction towards the Zambesi. The Sabia river rises only a few miles south of the source of the Mazoe, and flows south down to lat. 21° , then turns south-east to the junction of the Lundi river, and then easterly and enters the Indian Ocean. Many tributaries from the watershed flow into it, and also some small ones on the eastern bank, particularly the Manica. At the sources of these rivers the country is thickly populated: there are several extensive kraals, Gangwesi, Mebka, Sakaloto, Gansuma, Umsose, Kombise, Umtigesa, and many others: many of these Mashona chiefs are almost free from Lo Bengulu's rule; Umtigesa, Selumbom, Whiti, and Gutu, are some of them; there are others, but I do not know their names. The land is capable of growing everything that is required, all kinds of grain, vegetables, fruits, rice, cotton, indigo, spices, oranges, lemons, besides the native wild fruits. There are lofty mountain ranges towards the north, the native name of which is Leputa or Lebolo.

On the east of the Sabia river the country is under the Zulu chief Umzila; his country includes many districts, known as the Birue,

Batoka, Sofala, and others, down to the Mandanda region. How far this territory goes north I am unable to say. Umzila's kraal is in S. lat. $20^{\circ} 27'$, E. long. $32^{\circ} 28'$, between lofty hills, the altitude being 3180 feet by aneroid barometer, and is situated on the river Buzi, which flows in a north-east direction and enters the Indian Ocean. The country is very fertile, and the banks of the Upper Sabia river, which flows down through rich plains, flanked by high and picturesque hills, are clothed in all the beauty of tropical vegetation. Mahogany, ebony, and other valuable woods are found; large flocks of sheep and goats, and herds of cattle are reared. There is also the large game and many other kinds to be found, and a very peculiar red squirrel with black tail. The coast-line of my map is laid down from charts which I believe to be pretty correct. The Portuguese have no control over any part of Umzila's territory, they only hold possession of narrow slips of land along parts of the coast, but not along the whole. This information I obtained from Mr. Baker and others who have been all through the Mandanda country to Delagoa Bay, Inhambane, Sofala, and other places, prospecting for gold and hunting. The natives offered no opposition to my visits, and were willing to barter food for articles of clothing, principally linen cloth; but in many other portions of the country I had to use great caution to prevent suspicion as to the object of my visits. In many cases I have passed through tribes who would have been troublesome, but as I took goods to barter, I was considered a trader, and as such one can journey almost anywhere. Some considered also I was a doctor or medicine man, because I caught and preserved insects, snakes, and other small reptiles, besides plants. When this idea takes possession of some of the African races, they leave you unmolested. Any injury they might inflict would be considered unlucky to themselves.

The country east of the Sabia to the coast has never been explored sufficiently, except a route thence to Inhambane. Therefore early in 1877 I made arrangements to proceed to that region in order to explore it and obtain cotton samples of the cultivated and wild cotton, for submitting to the Chamber of Commerce at Manchester. I had forwarded various samples in 1875 to the Earl of Carnarvon, then Secretary of State for the Colonies, and I also left with Sir Bartle Frere a few similar samples when in Cape Town in April 1877. On leaving the Cape to proceed on my proposed journey, I had the honour of receiving from His Excellency certain instructions for my guidance in prosecuting my explorations in the regions I might be able to visit, and which I carried out as far as I was able with the means at my disposal; but I was prevented from completing my work by the opposition of the Matabele king. Nevertheless, I extended my journeys as far as I was able through his country, and after visiting several districts in those regions and down the Crocodile river, and along the lake and river road,

returned to Molopololo in August 1878. There I received a letter from Sir Theophilus Shepstone, stating he would be happy to see me if I could make it convenient to call on my return. Consequently, I arrived in Pretoria early in September, and after writing out several reports for His Excellency, I proceeded to the eastern boundary of the Transvaal, on to Lydenburg, New Scotland, Lake Cressie, Wakkerstroom, Pongola river, then to Utrecht and Zulu-land, where I remained with Colonel Wood's column, but was unable to explore much, it being unsafe to extend my journeys far from the camp. Such portions as I was able to survey are shown on the map.

I have to observe, that after the diamond-fields had been worked some years, many gold prospecting parties started in various directions. There being no map of the country for their guidance, I hastily compiled one from my own surveys and others, which was roughly lithographed, and issued in 1873. In the same year I also made a map of a portion of the country, which I forwarded to the Royal Geographical Society. It was not published and did not embrace all my surveys. I have carefully corrected some errors, and made considerable additions, the fruit of six years' explorations in the interior since the former map was made, and now offer the present map to the Society.

My several journeys will be published separately, in a work I am completing, of my sixteen years' explorations in South Central Africa.

In conclusion, I have to observe, no mention is made of the difficulties I have had to overcome, the hardships, trials, and privations I have passed through, the losses sustained and the risks that frequently surrounded me in penetrating alone those distant regions. To have done so would have extended this paper to undue length.

When the lower Zambesi, the eastern coast-line, and part of the Transvaal province are correctly surveyed and explored, the map of the whole of South Africa up to the Zambesi will be complete.

GEOGRAPHICAL NOTES.

Exploration of New Guinea.—The result of the deliberations of the Committee, appointed at the Southport Meeting of the British Association for the purpose of considering the means of promoting the scientific exploration of New Guinea, has been to recommend to the Councils both of the British Association and of the Royal Geographical Society, the expedition now in preparation by the experienced traveller Mr. Wilfred Powell, as one likely to advance greatly our knowledge of New Guinea, and therefore worthy of their patronage. Our Council has accepted the recommendation of the Committee, and will endeavour to obtain for Mr. Powell the countenance of Her Majesty's Government. Mr. Powell's plan, as submitted to the Committee, is to ascend as far as practicable the

Ambernoli river, and from his furthest point strike inland in the direction of the Finisterre Mountains; afterwards renewing his supplies at Astrolabe Bay, where his vessel will be in waiting, and making the attempt to cross thence to Port Moresby. He will sail direct from England in his own vessel, taking with him a steam launch for river navigation. The objects of his expedition are purely scientific, and will embrace a survey of the country explored, and the investigation of its geology, natural history, anthropology, and resources.

The 'Melbourne Argus' Expedition into the Interior of New Guinea.—Captain Armit, the leader of this expedition, returned to Cooktown, Queensland, early in October, after the enforced return of the party from the interior, in the London Missionary Society's steamer, the *Ellangowan*. The expedition included, besides the leader, Professor Denton, who joined it on its way with a view of pushing his natural history researches into the interior; Mr. Loftus Irving, second in command; Mr. Belford, a former companion of Goldie in his botanical journey up the Loloki valley; Mr. Hunter, and a large party of natives. The intention appears to have been to cross the island from Port Moresby to Dyke Acland Bay, a distance of 100 miles N.E. by E.; but the route of the party as they neared the Owen Stanley range seemed to be diverted more and more to the south-east, so that the farthest point reached, 120 miles E.S.E. from Port Moresby, was probably not more than 40 miles from the southern coast. Captain Armit's letters to the *Melbourne Argus* give a vivid idea of the mountainous and difficult nature of the country, and its extreme fertility and beauty. His telegram, published in the *Argus* of October 24th, gives the following information relative to the death of Professor Denton, and the last marches of the expedition:—"Arrived here (Port Moresby) on the 3rd September, after a most disastrous trip in point of illness. Reached Pauman, a village of the Seramina, 120 miles E.S.E., on 17th August. The natives were everywhere very friendly. Made the acquaintance of two entirely new tribes, who knew nothing of whites, and possessed not one scrap of iron. They were much frightened at us, but soon became reassured and very friendly. These people were cultivating large areas on the mountain slopes. Their territory lies on the Iala river, one of the Kemp Welch sources. The country was fearfully mountainous, not an inch of flat anywhere. On the 18th August Professor Denton complained of indisposition, but not seriously. He had before been suffering from a nasty ulcer on the instep. As we could not pierce into the range of mountains before us, owing to war between the tribes, I determined to return and make an attempt from a new point. We rested three days at Dedourie, having to climb over Mount Belford, 3600 feet high. Professor Denton was completely exhausted, having refused all nourishment and medicine since becoming ill. I remained with him and cheered him along and over the summit. Going down heavy rain soaked us through, and it was very cold. Belford

returned from the village with fresh men and a hammock. We carried Professor Denton into Lochivago. On the 24th, Belford was prostrated with fever, Professor Denton getting weaker, yet obstinate even regarding food as well as physic. On the 26th we started for Moroka, Professor Denton and Belford on stretchers. The fever attacked me before breakfast, and I had a terrible day. We reached Berigabadi at 2 p.m. The village was deserted. The natives propped up the crumbling roof of a hut, but the floor had sunk in the centre. Mr. Hunter, who was the only sound man of the party, made our beds. At half-past 8 p.m. Professor Denton had very slight convulsive fits; five minutes afterwards he was dead. It was pouring with rain, and the weather was close and sultry. That night we were forced to camp with the dead body between us. Mr. Hunter dug a grave, and we buried our unfortunate friend at 7 on Monday morning. We then proceeded to Moroka, thence to Sugairee, and on to Port Moresby by Narianouma. I have been suffering from fever ever since. Have visited Boira and Kabadi, which are the finest districts I have yet seen."

Dr. Otto Finsch's Visit to New Guinea.—Dr. O. Finsch, the distinguished German naturalist, paid a visit of five months' duration to New Guinea in the course of his recent three years' exploration of the islands of the North and South Pacific. He reached Port Moresby in a small schooner from Thursday Island in Torres Straits early in 1882, and received a friendly welcome from the missionaries of the London Missionary Society, who have made Port Moresby their chief station in New Guinea, and who placed an empty house at his service during his stay. He was glad to find here an excellent field for his anthropological studies, the Papuans being so little altered from their aboriginal condition, thanks to the little interference with native customs on the part of the missionaries and the few visits of traders to the place. He was delighted to have abundant means of studying the habits of a race of "pfahlbautern," builders of pile-dwellings, analogous to those of the Swiss lakes in prehistoric times, who are still partly in the condition of the stone age. The great differences in corporeal traits and habits between neighbouring tribes also afforded him much scope for observation and reflection. In a short boat journey along the coast eastward to Keppel Bay he found striking differences in the houses, utensils, and weapons from those of Moreton Bay; in one district bows and arrows were skilfully handled, in another these weapons were entirely unknown. With regard to the interior, Dr. Finsch says the furthest distance yet reached by Europeans from Port Moresby is a point five miles distant from the Owen Stanley Mountains, 40 miles in a straight line from the coast, this being the farthest attained by members of the ill-fated party of gold-diggers from New South Wales six or seven years ago. Dr. Finsch was of course speaking at a date prior to the recent expedition of Captain Armit. The resident missionaries have never yet been able to penetrate so far, not even Mr. Chalmers, a

gentleman of great enterprise and intelligence, who has lived among the natives many years, and has gained their full confidence. Dr. Finsch himself travelled a few miles inland, establishing himself for some weeks on the banks of the Loloki, a wild mountain stream flowing through magnificent scenery; he built here a temporary naturalist's workshop, calling it "Humboldtsheim," and made excursions in various directions, often as far as the Goldie river, a tributary of the Loloki on the right bank, which descends in a rapid current from the heart of the "Owen Stanley Alps." In journeys into the interior, he says, no reliance whatever is to be placed on the coast Papuas as carriers; he himself, after much trouble, obtained twenty men for this purpose from an inland tribe, the *Koiari*. In New Guinea, he says, the traveller has to carry all necessary stores and provisions with him; from the natives nothing as a rule can be obtained. He often obtained a view of Mount Owen Stanley, but want of native carriers willing to accompany him prevented him from trying the ascent; all his efforts were without effect, and he is convinced that no traveller will ever succeed in reaching the mountains with Papuan assistance.

Mr. Drummond's Visit to Lake Shirwa.—Mr. Henry Drummond, the naturalist sent out to Nyassa and Tanganyika by the African Lakes Company, has made an excursion from Mandala (east of the river Shiré) to the southern shore of Lake Shirwa. He says he and his party reached the lake in four days, travelling for the last three through a country which was obviously the dried-up bed of a much larger Shirwa. The soil was thin and poor and the whole district quite uninhabited. There were no hills, as the map led him to expect; nothing but a long gentle slope, gradually losing itself in marsh, and finally in the apparently drying-up lake. The rock is granite and gneiss with occasional bands of quartzite. He struck the lake at the mouth of the Palombe, where he found a village of two or three years' growth. The natives refused to pass the party on to the east side, and seemed to live in mortal fear of the Angoni or Mazitu. After two days' arguing they were offered canoes with which to cross to an island of considerable size (not marked on the map). But they decided not to accept the offer, as they would not have time to make the tour of the lake before the steamer they were obliged to catch left Matope on the Shiré. They obtained a good view of the south end and of the chain of hills on the other side. The height of the lake was found to be lower by nearly 200 feet than that given on Ravenstein's map, where it is marked 2000 feet. The boiling-point thermometer gave 208°·8 Fahr., the temperature of the air being 78°. After leaving the Palombe, the party walked north along the lake for some distance, and then made for Milemya's village on the east slope of Mount Zomba. Here were many villages and gardens about 1000 feet above the plain. Mr. Johnson of the Universities' Mission had been there a week before on his way to the north end of Shirwa. Mr. Drummond says he was within two days of the Lujenda river, which

the natives all united in saying did not flow out of Lake Shirwa, but was separated from it by a large sandbank.

Land to the North-East of Spitzbergen.—Dr. Karl Pettersen, Director of the Tromsø Museum, sends us the following:—"One of the vessels despatched from Tromsø during the summer of 1883 to hunt in the Polar Seas, viz. the sloop *William*, Capt. J. A. Sørensen, reached a point east of the northernmost promontory of East Spitzbergen (North Cape) past Cape Platen, where she remained for some time between the latter place and Rep Island. From the summit of this island, probably 600 to 700 feet (188 to 220 metres) above sea-level, Capt. Sørensen saw on August 24th, in clear and calm weather, a lofty land to the north-east. It seemed to be divided into two parts, but whether they formed a continuous mainland or two separate islands could not exactly be ascertained. The land finished above in a table-land, and entirely wanted the pointed cones which are characteristic of Spitzbergen. The land was estimated to lie about 20 Norwegian miles (110 English) away from Rep Island. The sea eastwards was perfectly free from ice, and it would have been very easy to have reached the land.—This land seen by Capt. Sørensen is more probably the same as that seen by Capt. Kjeldsen, of Tromsø, in 1876, and which he named Hvide-Oe, White Island. Capt. Kjeldsen reported that this land, rising high out of the sea, lay in $80^{\circ} 15' N.$ lat. and about $32^{\circ} E.$ of Greenwich. The land seen by Capt. Sørensen should, if the same, no doubt have lain a little further north, viz. in $80^{\circ} 45' N.$ lat. and about $32^{\circ} E.$ long., provided his bearings were correct. As these are, however, stated to have been unreliable, and the declination at the eastern limit of North-east Spitzbergen is probably about 6° to 10° west, the land seen by Capt. Sørensen may be placed a little further south, and will then be in about the same spot as that seen by Capt. Kjeldsen in 1876. This land is not to my knowledge delineated on any map of the neighbourhood of East Spitzbergen, by the Norwegians called "Nord-Oestland," i. e. North-Eastland. Thus on Petermann's map of Spitzbergen, No. V., which accompanied 'Geographische Mittheilungen' of 1872, the so-called "Stor-Oe," Great Island, is laid between $79^{\circ} 48'$ and $79^{\circ} 57' N.$ lat., and $29^{\circ} E.$ long., viz. south-east of Cape Smyth. According, however, to the assertions of Capt. Kjeldsen, this island has been laid too far south, and should be moved a little further to the north, which will make its northern promontory lie just east of Cape Smyth. White Island should therefore be situated in a direction north-east from Great Island. That the land seen by Capt. Sørensen is identical with White Island seems also to be demonstrated by the circumstance that a land such as that in question would undoubtedly have been discovered before by one or another of the Norwegian sloops which yearly visit this locality.—The following remarks anent the state of the ice east of Cape Platen during the period Capt. Sørensen stayed here, will I think be of interest, particularly in reference to the question

of future researches in this locality. When, on August 24th, 1882, Capt. Sørensen ascended Rep Island, it was entirely surrounded by pack-ice. The day before he had ascended Cape Platen without therefrom, at an elevation of about half-way up the mountain, being able to see firm ice in any direction. Three days after he was frozen-in in the pack-ice at Rep Island. The ice was not, however, ocean ice but ice from the fjords which had been driven to sea by wind and current without drifting far from the shore. The *William* lay frozen-in here for eight days, but throughout this time the sea was open to the east. A strong current ran the whole time eastwards.—The conditions of the ice within the Polar basin, are, as is generally known, very variable periodically, and it is therefore not every season that one might, as the case was last autumn, have reached in a suitable steamer, without risk, the land seen by Baffin in 1614, and by Gilles in 1707, viz. the so-much talked of Gilles Land, and a good distance further north along its west coast. Thus in 1871 Messrs. Smyth and Ulve found the sea perfectly free from ice from Cape Smyth east and northwards, and in 1876 Captain Kjeldsen reached within sight of White Island, while during later years our Arctic hunters have found the sea perfectly free from ice in this locality, viz. as a rule from the end of August until the second half of September. Captain Sørensen believes, in fact, that the state of the ice is every autumn somewhat similar to that of the past year, but at the same time points out that the real difficulty will lie in penetrating through the narrow strait off the North Cape, between the latter place and the Seven Islands, where the pack-ice may place serious obstacles in the way of progress eastwards to the open sea. However the conditions may be in one particular year, the experience of the last ten years seems, in my opinion, to demonstrate that access to this part of the Polar Sea is so often possible that this locality seems to form the *point d'appui* from which an attack on the Pole should be made.—Petermann asserts that Gilles Land is situated in $81^{\circ} 30' N.$ lat. and 35° to 36° long. E. of Greenwich, while the western promontory of Franz-Josef Land, Cape Lofley, seen by Mr. Leigh Smith in the *Eira*, in 1880, is said to lie in $81^{\circ} N.$ lat. and 42° E. long. From this we may conclude with a degree of certainty that Gilles Land really exists, and that it in fact forms the most western part of the Franz-Josef group of islands, and that the coast-line of the latter bends, as the case is at Capes Ludlow and Lofley, in a north-westerly direction further along Gilles Land. The strong current of warm water which flows from East Spitzbergen in the direction of Franz-Josef or Gilles Land, and thence, curving in a north or north-westerly direction, seems also to point to a very favourable opening for approaching the Pole from this spot. There seems in fact every reason to assume that it would under ordinary circumstances be a matter of no great difficulty to reach Gilles Land from East Spitzbergen, from whence an expedition might then be despatched northwards either by sea or

land, according to circumstances. As, however, the return late in the autumn may be cut off, it would be advisable to prepare for wintering at Gilles Land. For the safety of the expedition a depôt should also be established at East Spitzbergen, for instance, at Broch, Foyn, or Rep Island, and as the station in Mossel Bay, erected by Nordenskiöld when wintering there, is still maintained, the return journey would in any case be secured. By the flow of the current the access to Gilles Land should be easier from East Spitzbergen than along Franz-Josef Land.—I beg in passing here to call attention to the *ski* of the Norwegians, viz. snow-runners, on which persons may proceed easily over fields of snow and ice. Skilled runners would undoubtedly be of immense service on such an expedition. Nordenskiöld made use of this means of locomotion during his expedition to Greenland, from which he derived great benefit, and in future Polar expeditions more importance will, I believe, be attached to the same than has hitherto been the case.”

CORRESPONDENCE.

The Landfall of Columbus.

51, HOLLAND ROAD, KENSINGTON.
December 5th, 1883.

I received some months since from its author, Captain G. V. Fox, a paper published by the United States Government, in the United States Coast and Geodetic Survey, Appendix 18, Washington, 1882, 4to., entitled, “An attempt to solve the problem of the first landing-place of Columbus in the New World,” in which Captain Fox refers to me as the author of a paper on that subject, read before the Royal Geographical Society on the 8th of May, 1871. The question in consideration is the position and modern name of the island which was the first land reached by Columbus in the New World, named by him San Salvador, and known to the Indians as Guanahani. In my paper referred to I gave my reasons for believing that Watling Island is the spot. Captain Fox believes it to be Samana, an island considerably to the south-east of Watling. He bases his arguments on the Log, in which Columbus describes his movements from Guanahani to the unmistakable island of Cuba. From this Log Captain Fox has deduced inferences, embodied in a 4to. book of 68 pages, which refer to distances, bearings, rates of sailing, shapes of islands, doubtful dates, ambiguous expressions in the Log itself, such as have puzzled the best Spanish scholars, conjectured possibilities, &c., &c., deductions in which he differs from all previous commentators, but by which he “aims at solving the problem of the first landing-place of Columbus in the New World.” There exist three means to help us in coming to a conclusion on this interesting point: 1. The aforesaid Log; 2. Columbus’ own description of Guanahani; and 3. the evidence of the earliest maps bearing on the subject. It is reasonable to suppose that others, including myself, have well thought over the difficulties presented by the Log, and I have seen no reason to alter the conclusions which pointed to Watling Island as Guanahani; but whatever any one’s conclusion might be from that one branch of evidence, it is obvious that the theory propounded must be erroneous, if the island assumed to be the starting-point in the Log is irreconcilable with

Columbus' own description of Guanahani. Now, the most striking fact in Columbus' description of this island is that it contained a very large lagoon in the middle. My paper was accompanied by a map of Watling Island, in which the most conspicuous object is a very large lagoon in the middle. Captain Fox also supplies a map of Samana, which contained no lagoon whatever, nor, from its conformation, could it contain a lagoon in the middle, although, as Captain Fox says, "during the season of rain there is a row of ponds parallel to the shore," a circumstance which no process of reasoning can convert into a very large lagoon in the middle of the island. For the third branch of evidence I had recourse to the work of Herrera, the official historiographer of the Indies in Spain, who had under his special charge original documents in the handwriting of Columbus and his contemporaries. From these in 1601 he laid down a map of the Bahamas, in which the positions of the islands are as near as could be, allowing for cartographical improvements, the same as on the excellent maps of to-day, while ten of them bear the names they have now. This map therefore affords, by comparison of their relative positions, a perfect means of identifying the islands on the old maps with their corresponding representatives on the new, and on it we find Guanahani where Watling Island now lies, while to the south-east is clearly shown the modern Samana under the name of Samana. The two islands Guanahani and Samana are also represented perfectly distinct and separate, on the map by Juan de la Cosa, Columbus' pilot, made in 1500.

In presence of these facts, I see no reason for altering the conclusions which I had the honour of laying before the Society in 1871.

R. H. MAJOR.

REPORT OF THE EVENING MEETINGS, SESSION 1883-4.

Second Meeting, 26th November, 1883.—Major-Gen. Sir H. C. RAWLINSON, K.C.B., in the Chair.

ELECTIONS.—*Captain Pelham Aldrich, B.N.; Captain N. Bowden-Smith, B.N.; Rev. B. Raike Bromage; Rev. J. M. S. Brooke; William Bussell, Esq.; Frederic P. Carrel, Esq.; Joseph Fothergill, Esq.; John Larkin Fry, Esq., J.P.; Commander Chas. Edward Gissing, B.N.; C. Gorsira, Esq.; Thomas Kilner Gregory, Esq.; Arthur Wm. Follett Halcombe, Esq.; William Hancock, Esq.; Rev. Jas. Hannington; Charles Harris, Esq.; William Green Harrison, Esq.; Benjamin Hocart, Esq.; Chas. King Holliday, Esq.; Edwin Holness, Esq.; Staff-Commander Richard F. Hoskyn, B.N.; Alex. Brand Inglis, Esq.; Chas. Samuel Jago, Esq.; H. H. Johnston, Esq.; Rev. Willis Fleming A. Lambert, M.A.; Commander Weyland Mere Latham, B.N.; Rev. Jas. Lawrence; Lieut. N. E. Cornwall Legh, B.N.; J. H. Stewart Lockhart, Esq.; Hugh Brooke Low, Esq.; James Fitzroy Mc'Carthy, Esq.; Alex. Macdonald, Esq.; Alex. Macaulay Markham, Esq.; The Hon. Rao Sahib Vishwanath Narayen Mandlik, C.S.I.; Jno. Francis Moss, Esq.; Henry Pearson Nairn, Esq.; H. Harrington Nelson, Esq.; Wm. Nield, Esq.; Rev. Jno. Pate; David Alex. N. Potter, Esq.; Bruce Hersey Potter, Esq.; Surgeon-Major William Robertson; E. M. Satow, Esq. (Secretary of H.M. Legation, Yedo); Archibald Stirling, Esq.; George Carter Stent, Esq.; Jas. Smith Sutcliffe, Esq., J.P.; Hy. Wadsworth Syers, Esq.; Chas. William Thompson, Esq.; Thos. C. Thornicroft, Esq.; Robt. Jas. Walker, Esq.; Harold Westbrook, Esq.; Cecil Carus Wilson, Esq.; Charles W. Wood, Esq.; Navig.-Lieut. Philip Wright, B.N.*

In opening the business of the evening, the CHAIRMAN said that the President, Lord Aberdare, was prevented by a family bereavement from attending the meeting, and had requested him, as an old President of the Society, to take his place.

Before proceeding to the immediate business of the evening he wished to mention two matters of some interest to the Society. The first was with regard to King Mtesa, whose death was, a few months ago, announced in many newspapers. According to the best information that could be obtained it was now believed to be a false alarm. A letter had been received by the Foreign Office from Sir John Kirk, dated 22nd September, in which it was stated that no reliable news of the event had reached Zanzibar, and that the best native authorities disbelieved it. News to the same effect had been received from the Victoria Nyanza by the Church Missionary Society. The other matter which he had to report was with reference to the movements of their agent, Mr. Thomson. Through the kindness of the Eastern Telegraph Company the following telegram had been received from Zanzibar, dated November 13th:—"Thomson heard of 1st of August about Lake Naivash in the Masai country. All well. No letters." Lake Naivash was the furthest point reached by Dr. Fischer in the present year, from which his expedition returned to the coast. It was a satisfactory telegram, giving a good account of Mr. Thomson's progress so far. Sir Henry then introduced to the meeting Mr. Chas. M. Doughty, the author of the paper about to be read. He said Mr. Doughty had recently travelled through the western centre of Arabia. It was a remarkable, and at the same time satisfactory, feature in the proceedings of the Geographical Society that they had fortunately been the means of introducing to the world all the recent important Arabian travellers,—he referred to Mr. Wallin, who about twenty years ago appeared before the Society, Mr. Palgrave, who described his extraordinary travels through Arabia some years ago, and next, Mr. Wilfred Blunt. Mr. Doughty was an amateur traveller who went to the countries which he had visited not for any purpose of business or duty, but simply to see the country, to examine the antiquities, to get copies of inscriptions, and to make himself generally useful to the scientific world. He had brought back a vast number, both of copies and squeezes of inscriptions, and he had also made a very good map of the country. He had traversed nearly 1000 miles of Central and Western Arabia which no European had ever before set foot upon. Consequently his travels were of geographical importance. Unfortunately he had no instrument except an aneroid barometer with him, and if he had he would have been unable to use them; but he made use of his eyes and ears, and acquired as much information with regard to the country as was possible. He proposed on the present occasion to give a *viva voce* sketch of his travels from the North of Arabia, through Nejd, and then down to Mecca.

Mr. Doughty then addressed the meeting on his "Travels in North-western Arabia and Nejd." Publication deferred to a subsequent number of the 'Proceedings.'

Third Meeting, 10th December, 1883.—The Right Hon. Lord ABERDARE,
President, in the Chair.

ELECTIONS:—*Beale Colvin, Esq., J.P.; Alexander Ewing, Esq.; H. W. Eve, Esq., M.A.; H. O. Forbes, Esq.; Sidney Stuart Grant, Esq.; Wallon Haydon, Esq.; Henry Lowther, Esq.; R. Neaves McCosh, Esq., M.A., M.D.; Sir Patrick L. MacDougall, K.C.B.; William Pritchard Morgan, Esq.; Henry Maxwell, Esq.; Edward Pierson Ramsay, Esq.; Lieut. Charles Stewart Smith, B.N.; Christopher Barker Smith, Esq.; Captain Monier Williams Skinner, R.E.; Arthur R. Verschoyle, Esq.*

The paper of the evening was "A Visit to Kafirstan." By W. W. McNair.
Vide ante, p. 1.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—November 23rd, 1883: M. BOUQUET DE LA GAYE, Vice-President of the Central Commission, in the Chair.—MM. Hofer and Burger, publishers of Zurich, announced that they had just published the photolithographical reproduction (which was exhibited at the last Swiss Geographical Exhibition) of the first map of Switzerland, prepared by Ægidius Tschudy in 1538. The only copy of the original map extant is preserved in the library of the University of Basle.—A Society which has just been formed with a view of promoting free emigration to the French colonies, and especially to Algiers, forwarded a copy of its rules and regulations. The Society proposes to establish colonists in Algiers, and to recruit and maintain them out of the funds raised by private subscriptions and donations. The rules are prefaced by a statement of the objects, principles, and resources of the Society, and a report is to be issued to keep the members conversant with the progress of the work.—The Secretary announced the departure for Senegal of M. Chapron, one of the members of the Society, who has gone to superintend the construction of the Bafulabe railway. The suddenness of his departure prevented him from taking the instructions of the Society.—M. Frederico Fernandez, captain of a frigate in the Navy of the Argentine Republic, and second in command of the Naval School, informed the Society that M. Moreno had reached the slopes of the Andes, where he was pursuing his interesting explorations; also that the Argentine Government had just despatched two small steamers to explore the river Limay, with instructions to push forward as far as Lake Nahuel-Huapi, at the foot of the eastern slopes of the Andes. The Society will be informed of the results of these explorations.—Lieutenant Fred. Schwatka, of the United States Army, announced his return from an exploration in the interior of British Columbia and Alaska.—M. Lud. Drapeyron, editor of the ‘*Revue de Géographie*,’ read a short paper upon two towns in Tongking (viz. Sontay and Bac-ninh), which are at the present moment engaging public attention in France, in consequence of the operations which the French troops are taking against them. The author of this communication is M. Ch. Labarthe, who has already published in the same work a number of articles, full of fresh information upon Tongking. In the present paper, after giving a description of these two towns, which he visited eighteen months ago, he endeavours to show that their surrender will by no means decide the question, but that the French should proceed to attack other towns, occupied by the Chinese, and situated much higher up on the Yellow River.—Tongking formed the subject of two other communications, addressed to the Society by M. Romanet du Caillaud. One referred to the taking of Ninh-Binh, which recently fell before the French arms. The town had already been taken in 1873 by M. Hautefeuille, a young midshipman, at the head of some sailors. The other communication treated of the Franco-Chinese question. The author maintained that France had, by the treaty of the 25th August 1883, as much as by that of the 5th June 1862, the right to oppose all dismemberment of the kingdom of Annam, “which,” says he, “would not be to its interest.” This declaration was made in answer to the claims of China, who desires to possess a part, if not the whole, of Tonking. M. Romanet du Caillaud then went on to describe the boundaries of Annam on the Chinese side, which have, he says, been fixed for centuries. The reading of two further letters, received at the last moment from the same correspondent, was reserved for the next meeting of the Society. The first of these treats of the fluvial system of North Tongking, and the other discusses the rights of Portugal upon the Lower Congo.—A short paper was received from M. Leopold Hugo upon graphical statistics at the Universal Exhibition of Amsterdam of the present year. The

author points out how the graphical system has extended abroad. Among other facts, he adduces the importance of the magnificent coloured plates which accompany the recent work devoted to the census of Prussia, by M. Blenck, successor of the learned registrar, Dr. Engel. This is the first time that the graphical system has been officially employed in a European census. That France, however, has followed the movement, is proved by the works exhibited by the Minister of Public Works.—The Chairman then intimated that M. Chancourtois would, at one of the coming meetings of the Society, discuss the question of the "First Meridian," which is one of the leading topics of the day. Ought France to concur in the adoption of the meridian of Greenwich or not? The Society would also have the pleasure of hearing M. Martial, commander of the ship *La Romanche*, who had returned from a scientific mission to Cape Horn, where he has made some important meteorological and magnetic observations, &c.—The Chairman stated further that as M. de Lesseps, President of the Society, was still in England, it was then impossible to fix the date of the general meeting of December. That M. Alph. Milne-Edwards (of the Institute) had promised to speak at that meeting, and give an account of his scientific campaign on board the *Talisman*. He would show by means of projections with the electric light the nature of animal life at the bottom of the ocean, 2500 fathoms from the surface.—In conclusion, M. Paul Lévy, civil engineer, addressed the meeting upon the gold-mines of French Guiana. He described the resources of that colony, which, since auriferous beds have been discovered there, appears to give promise of becoming one day a second California. The photographs, which the lecturer submitted to the audience, showed the most minute details of the interesting industry of gold extraction, the character of the giant forests of the interior of Guiana, and the physiognomy of the strange population which works on the placers. Finally, M. Lévy asked for an official exploration of the auriferous districts of the colony, and the publication of the results of such an exploration, in order that French capital might be expended with advantage in that direction, instead of being squandered in a multitude of foreign and disastrous enterprises.—In the report of the Society's last meeting (November 9th), it should have been stated that M. Schrader presented to the Society the first sheet of his map of the Central Pyrenees, more particularly of the Spanish Pyrenees, scale 1:100,000. This sheet, which represents very nearly a sixth of the whole work, contains three of the principal peaks of the Spanish Pyrenees, two of which had never appeared before on any map. The summit farthest east had already been thoroughly surveyed by Mr. Ch. Packe, the English traveller, who for a long time has been exploring the Pyrenees, and has given us a map of the Maudits Mountains. The peak of Posets attains an elevation of 11,047 feet (3367 metres), and is situated on another summit still more important, although not of such elevation, viz. *Eriste*, the name of which had only been mentioned previously in the publications of the French Alpine Club. The third peak, that of *Los Ibones*, which had already been described by Earl Russell, rises to a height of 9734 feet (2967 metres).

— December 7th, 1883: M. BOUQUET DE LA GRÈVE, Vice-President of the Central Commission, in the Chair.—The Chairman called the attention of the Society to a collection of magnificent coloured photographs, which were exhibited in one of the entrance halls. The collection had, he said, been brought from Japan by M. Krafft, and contained types of the Japanese and scenes of their domestic life. He then announced that the General Meeting of the end of the year would be held on the 21st of the present month, and that it would be followed on the next day by the usual banquet. These dates had been fixed the very moment M. Ferdinand de Lesseps returned from his visit to England.—M. de Lesseps, who was present at the meeting, was then requested by the Chairman to say a few words with reference to

his visit. M. de Lesseps, however, begged to be excused, and only said that he had been present at one of the meetings of the Royal Geographical Society of London, at which he met with a most cordial reception; the President, Lord Aberdare, bade him welcome in a most graceful speech. "I am happy," said Lord Aberdare, "to find myself brought into relation with the President of the Geographical Society of Paris, which, in conjunction with that of London, contributes to the progress of science and civilisation." "In reply," added M. de Lesseps, "I said it was true I was President of the Society of Paris, but that, according to the constitution of the Society, it was the Central Commission which did all the work, and it was therefore to it and to M. Maunoir, the General Secretary, that the praise, which Lord Aberdare had been good enough to accord to our Society, ought in justice to be given."—M. Ludov. Drapeyron, editor of the '*Revue de Géographie*,' and General Secretary of the Topographical Society, transmitted the report which he has just presented to that Society in his official capacity. He requested that the part of this report which refers to the establishment of a National School of Geography, should be inserted in the Report of the Meetings.—M. J. J. de Mendonça Cortez, a Portuguese councillor, sent to the Society two specimens of the map from the Portuguese staff-office, which has been set in relief by a process of which he is the inventor; these reliefs were accompanied by two copies of the same map with plane surface, in order that the relative merits of the maps might be compared. He sent also his pamphlet on the subject entitled, '*De la Cartographie et d'un nouveau système de relevage des Cartes*' (Paris, 1883, 12 pages 8vo.). The General Secretary spoke very highly of the process invented by M. de Mendonça Cortez, by which the inconveniences resulting from the ordinary form of relievomaps can be avoided.—M. Baudens, who is engaged on board the *Victorieuse*, wrote from Hong Kong to correct a paragraph in M. Maunoir's last annual report on the progress of geography, in which he spoke of the organisation of the Meteorological Observatory of China. In his report he awards the honour of its formation to Sir Robert Hart, while, according to the correspondent, it belongs to a Frenchman. The work was already in full progress, when Sir Robert Hart made a grant, and authorised the communication of the observations to the ports and lighthouses of the Chinese coast. In order to establish this fact, he transmitted an extract from the review which he has drawn up of the works of M. P. Rechevreno (or Dechevreno) the learned Director of the Observatory of Rikawei.—M. A. Certes, Inspector of the Finance Department, sent to the Society his pamphlet '*De l'analyse microscopique des Eaux*.' The various processes which he mentions in the paper, and seeks to popularise, can be utilised by travellers, to whom it is most essential that they should know whether the water they meet is drinkable.—M. René Roy, who was prevented from attending the meeting, forwarded the translation of a letter written by a Swedish officer connected with Stanley's Expedition. The writer gives a description of the route from Akassa to Bidda along the Niger. He had been despatched to the banks of the Congo, with instructions to recruit a hundred Haussa families, and to conduct them to the stations founded by Stanley, which they were to colonise.—A letter was received from M. Dutreuil du Rhins apologising for his inability to be present at the meeting, being confined to his house in consequence of fever contracted during M. de Brazza's expedition, and stating that the last news he had received with reference to this expedition was very satisfactory. Dr. Ballay, who had on the 23rd of July launched his little steamer (which was made to be taken to pieces) on the Alima, was prosecuting his negotiations with the Apfouroux. He should then proceed to King Makoko, whither the chief of the mission would follow him. Makoko was stated to be awaiting the arrival of M. de Brazza with impatience. The latter wrote on the 3rd of August from Franceville, when he was in perfect

health. Several of his colleagues had been detached from him for the purpose of guarding the stations on the Ogowé. The correspondent also stated that M. Decazes, who has gained great experience by a long stay in Senegal and numerous travels, should have started on the 18th of October from Lambarena in order to establish the new station of Bowé, between Achouka and the Adoumas. M. D. du Rhins reminded those present that the mouth of the river Ogowé had been connected with the now ancient station of Franceville by a line of new stations, which were as follows: Cap Lopez, the centre and chief depôt of the mission; Lambarena, now only a temporary station; N'jole, the first important post; Achouka, in the country of the Okandas; Nguixi (?) in the Adoumas territory.—The Chairman then welcomed two young travellers who were present at the meeting, viz. Baron Benoît Méchin and Count de Mailly-Châlon, and stated they had just returned to Paris after passing two years in Asia. M. Méchin, who had not come prepared to speak, gave a brief sketch of the itinerary of his journey. The two friends first visited Japan, and then having started from Tokio in August 1881, they proceeded to Peking, and thence to Manchuria. Passing into Siberia they sailed over Lake Baikal and reached Irkutsk. Thence in March 1882 they journeyed to Tomsk, and descending to the south, they entered Central Asia by way of Semipalatinsk. After various excursions, they reached Tashkend, which they left in November. Still travelling eastwards they arrived at Khiva, and departed from there in May last. Then traversing the desert of the Turkomans, they passed on to Merv, and followed the route of the Khorasan as far as Teheran. From the latter place they proceeded to Astrakan, and returned to Paris on the 25th September last, via Moscow and St. Petersburg.—The Secretary then read two communications from M. Romanet du Caillaud, the reading of which had been postponed from the previous meeting. In one of these papers the author discusses the "Rights of Portugal on the Lower Congo." Portugal, he says, bases her claims on (1) the discovery of the country made in the name of the Portuguese nation, and with intention to take possession; (2) the possession itself, proved, both by public acts verifying and claiming her sovereignty, both by political institutions and acts of jurisdiction; (3) the recognition of her claims by the powers of Europe expressed in diplomatic documents. These are the three points upon which M. Romanet du Caillaud dwells in succession. He affirms that it would be very useful in the extension of French colonial interests in Africa for France to make an alliance, which he calls "*en participation*," with Portugal, on the analogy of the principle of "*société en participation*" recognised in common law. He communicated a letter, received by him from the permanent secretary of the Geographical Society of Lisbon, thanking him for having defended the claims of Portugal. The second paper is devoted to a description of the "Hydrographical System of Northern Tongking." The object of the writer is to correct certain errors which he has observed in his previous geographical studies on Tongking. He describes (1) the basin of the Canton river, (2) the basin of the Gulf of Tongking, (3) the capitals of the northern provinces of Tongking.—M. Alfr. Bardey wrote from Algiers (November), and sent to the Society some photographs, which M. Rimbeaud, the agent of his commercial house at Harar, had recently forwarded to him. M. Rimbeaud is superintending all the expeditions organised by the firm, four of which are now in progress, one in Dankali, another in Hanosh, a third on the Wabi, in the neighbourhood of Ogaden (south-east of Harar), and the fourth on the Wabi, near Ennya (south of Harar). A geographical report will follow all these researches. The correspondent promises further to send a map of Somali, Harar, and the Gallas country.—Dr. Hamy forwarded a short paper on the Mâhdi and the insurrection in Soudan, written from Khartoum, by M. Mouça Peney, son of Dr. Peney, a former member of the Society, who died at Gondokoro, while

attempting to ascend the Nile.—M. Anquetin then opened a discussion on the question of the “Universal Meridian.” He pointed out that it is a subject which interests not only men of learning and science, but also, and in the highest degree, the directors of railway traffic, great commercial travellers, large manufacturers and traders, who are brought into relation with all parts of the world, that it affects telegraph companies, newspaper proprietors, and the public at large. He requested, therefore, that the Society would use its influence with the Government in order that to the next congress which meets to solve the question, delegates might be sent, representing these various classes of society. M. Anquetin asked that, if the meridian of Greenwich were agreed upon, England should be requested to adopt the metric system, in exchange for the concession of this regulating meridian. M. Bouquet then rose and addressed the meeting, on behalf of M. Faye (of the Institute). He gave a *résumé* of the paper which M. Faye read at the last meeting of the Academy of Sciences, he having been commissioned to communicate it to the Geographical Society of Paris. The paper discusses the question of the “universal hour,” and M. Bouquet de la Grye expressed at the same time his own private opinion on the subject. He stated that he was opposed to the adoption of the meridian of Greenwich as the initial meridian, and especially so, if it should be decided to do so on the ground that England is the chief maritime power. “Who knows,” said he, “whether this would be the state of things a hundred years hence? Would the meridian have to be changed again then?”—In conclusion, M. H. Bernard made a communication on the Lower Niger.

Geographical Society of Stockholm.—October 19th, 1883: Dr. MONTELIUS, President, in the Chair.—The Society recommenced its meetings after the summer vacation. The President read a letter from Mr. H. M. Stanley, dated from Stanley Pool on the Congo, in which the explorer thanked the Society for the honour they had conferred upon him in decreeing to him its gold medal (the *Vega* medal). Baron Nordenskiöld then gave an account of his expedition to Greenland. As the same had, however, been exhaustively described in the newspapers, he confined himself to referring to the main features of his journey, viz. his wanderings on the inland ice, the *Sophia's* visit to Cape York, the expedition to the east coast, where he still believed that the colonies of the Norse were situated, the drifting in the pack-ice, and finally, his landing twice on the east coast, a fact unaccomplished by anybody for four centuries. He concluded by asking that the two chronometers of the Society which the two Lapps had used on their “skid” journey of 120 miles in the interior, no doubt one of the most remarkable on record in Arctic exploration, should be presented to them, a proposition heartily agreed to. The Baron next read a telegram he had received from Lieutenant Hovgaard, in reply to his inquiry whether it would have been possible to have reached the Yenisei this summer viâ the Kara Sea. The Danish explorer stated that there would have been no difficulty in effecting this passage. Baron Nordenskiöld further pointed out that Lieutenant Hovgaard would already in 1882, no doubt, have succeeded in doing this, had he not been compelled to leave the ice-free channel by the coast in order to assist the *Varna* beset in the pack. He, the speaker, drew special attention to these points as the failure of the *Dijmphna* expedition had been advanced as a proof of the unsoundness of his theory as to the navigability of the Kara Sea. The President next presented a petition from Dr. Hjalmar Stolpe for obtaining the *Vega* stipend for scientific excursions during the voyage of the Swedish frigate *Vanadis* round the world about to take place, and in which he was to participate. The entire sum—about 100*l.*—at the disposal of the Society was accorded to Dr. Stolpe. Some interesting ethnographical objects presented to the Society were exhibited at the meeting.

November 16th: Dr. MONTELIUS, President, in the Chair.—Dr. Stolpe exhibited and discussed certain ethnographical objects and forms of ornamentation from the islands of Borneo, Celebes, the Solomon Islands and New Britain. The speaker drew attention to the circumstance that the development of types of form and design had been studied chiefly by northern archeologists. He pointed out the gradation of certain forms of ornament, as for instance a spear from New Britain; it was lengthened in the lower end by means of leg-bones of men or cassowary, an addition or ornament which had been imitated on other spears by being drawn on the wood itself. This development had been effected through a whole series of small modifications. The result was so different that there was no similarity whatever between the two extreme types; they could in fact, only be connected by tracing the development gradually through the entire series. The same phenomenon was also apparent in faces on spears from the Solomon Islands, and in figures on shields from Celebes and Borneo. He was, however, of opinion that this transformation could not serve as a chronological indicator, as no doubt the original form of ornament had been retained even while the development had taken place. He next showed some ornaments of Malay origin, which had undoubtedly been used as pendants, still one was larger than the other. This difference was always apparent; that one of two pendant ornaments was always larger than another was a distinct feature in the Malay culture, which could only be explained as symbolic of the relative position of man and woman.—Dr. C. Bowallius, who has just returned from an exploration of Central America, next gave an account of the interoceanic lines of communication which he had examined during his journey in 1882 and 1883 in that region. The first of them was the Panama Canal, now being constructed; this was estimated at 73 kilometres in length, and would run from Colon or Aspinwall, on the Atlantic side, to Panama on the Pacific. The line projected was not, perhaps, the one most advantageous, but political as well as economical reasons had caused it to be preferred by the French company which had undertaken this gigantic work. One great drawback to this line was the absence of harbours at either end. Panama was entirely wanting in a harbour, and although the port as a rule was safe, it was at times visited by terrific tornadoes. He had himself seen a ship capsize in the harbour during a storm. The plan was therefore to continue the canal through the Panama Bay itself to the Taboga Island, where there was a good harbour. The port of Colon, on the other, was perhaps safer, but it was so small that only a limited number of ocean-going steamers could be anchored there. The port was most dangerous during the winter months. In 1879, during a gale, a vessel anchored in 17 fathoms of water struck the bottom in this depth and foundered. But the engineering difficulties to overcome in constructing the canal were not so great as at first anticipated. It was, for instance, believed to be necessary to blast a road through 23–25 kilometres of rock, whereas it was now discovered that only five to six kilometres were rock, and the rest only a layer of sand, easily worked with spades. The highest point was 87 metres above sea-level. The most serious difficulty was the climatic one, and the fevers. The sickness and death-rate among the labourers was very high, as might certainly have been expected when the great loss of life sustained in building the Panama railway was remembered. Of a force of 7000 men the Company reckoned about 1000 were always in hospital. Latterly they had, however, succeeded in finding men who resisted the climate better. This was a tribe of Indians from the Magdalena river, who were besides better workers than the negroes from the West Indies. As engineers it was, however, necessary to employ Europeans, and the French seemed to withstand the climate the least. The speaker asserted that there was not a single engineer who had been able to attend to the work beyond one year and a half, although the contract was for two. In Panama and its vicinity thirty-seven engineers out of less

than a hundred died during the months of March and April 1882. Of the technical difficulties to overcome the worst seemed to be to get rid of the excessive quantity of water which collects in the river Chagres—on the Atlantic side—during the rainy season. Lesseps had for this purpose proposed the construction of an enormous dam, which alone would cost 100 to 150 million francs. This project had, however, been found impracticable, and another one had the drawback of requiring locks, but Lesseps had promised a canal without locks. How the difficulty was to be overcome had not yet been settled. It was, however, quite clear that the canal would cost much more than 600,000,000 francs, as estimated. Dr. Bowallius then proceeded to describe another interoceanic road of communication less known than the former. This was the projected and partly built railway through Costa Rica. This little state had, through the flourishing of the coffee industry, and the settled political condition, been able to undertake this gigantic venture. The road is, however, far from being completed. It runs from Punta Arenas on the Pacific to Espartaco, a distance of nineteen kilometres. Here begins the old carriage road along which goods are still carted on bullock-waggon, as in the days of the ancient conquistadores. At Alajuela, 320 feet above the sea, the railway again begins and runs to Cartago via San José, the capital. From the magnificent high plateau of San José, with its vernal climate and extensive coffee plantations, the authorities had as yet not succeeded in continuing the railway down to the Atlantic Ocean. The territory here presents great difficulties. From Puerto Limon on the Atlantic, the other end of the line, the railway has been built a little way into the interior, although the works here, as at Panama, have cost thousands of lives. The whole line is estimated to cost 200,000,000, but at present Costa Rica, through the fall in the price of coffee, and the extravagance of the late President, is not in a position to conclude the work. The third line of communication was across Lake Nicaragua, the oldest of all these schemes. From the days of Columbus attention had been most particularly devoted to this district, as it was at first imagined that the so much sought-for "sound" to the Pacific would be found here. Strangely enough, the river San Juan, the outlet of the lake, was at that time accessible to large vessels. The idea of cutting the small Isthmus separating the lake and the Pacific was easily conceived, but on measurements being effected it was found that this ocean lay higher than the Atlantic, and fears were entertained of inundating the West Indies by the canal. Through earthquakes in the middle of the seventeenth century, and some mistaken fortifications in the mouth of the river, the San Juan has become too shallow for large vessels. It was, however, first shown by an Englishman, Mr. Lloyd, and a Swede, Mr. Fahlman, that there was really no difference between the levels of the two oceans, and in consequence of this opinion the question of a Nicaragua canal was seriously mooted. Several schemes were drawn up, but were not carried into effect in consequence of the innumerable revolutions in the Republic. In 1849, during the Californian gold fever, an American company started a ferry across the lake for the transport of passengers to San Francisco, but this was abandoned when the Panama railway was opened. In latter days a new scheme has been mooted. An American company has examined the territory and come to the conclusion that a canal may be constructed here at far less cost than at Panama. It is proposed to dredge the San Juan river, and then to cut through the Rivas Isthmus, where the highest point is only 26 feet above the level of the sea. This canal was, however, the speaker stated, to be built for the account of the United States, and closed to all vessels of other nations. The proposal had not yet obtained the sanction of the Congress.—The last to address the meeting was Dr. Stolpe, who gave the outlines of the impending cruise round the world of the Swedish frigate *Vanadis*, in which he was to participate as ethno-

graphical scientist. Through the Strait of Magellan the route would be to Valparaiso, Callao, the Marquesas and Sandwich Islands. The speaker's intention was to collect all ethnographical objects obtainable and effect geographical researches. He hoped on the way through the Pacific to be able to visit Malden Island, with its remarkable ruins. The frigate would proceed to Yokohama by way of the Marshall Islands, the eastern Carolines, and the Marianes. In Yokohama the stay would last a month, which Dr. Stolpe would employ in an excursion by land to Kobé and the remarkable old capital Kioto via Nagasaki. The *Vanadis* would proceed to Shanghai, Hong Kong, and Manila, and thence home, calling at the ports of India. In conclusion the speaker thanked the Society for its generous donation of 100*l.* towards the object in view, which he said could only be realised by further contributions from the public, as there were no funds at the disposal of the Government for such a purpose.—The meeting concluded with the President wishing Dr. Stolpe *bon voyage* on behalf of the Society.

Italian Geographical Society.—November 19th, 1883: The DUCA DI SERMONETA, President, in the Chair.—A crowded audience met in the large hall of the Society to hear Count Pietro Antonelli's account of his recent journey from Assab to Shoa. There were present many foreigners resident in Rome, besides numerous distinguished Roman citizens, including the Ministers of Foreign Affairs, of Agriculture and Commerce, and of Justice. On the platform was exhibited the ethnological collection brought from Shoa by Count Pietro Antonelli. A large wall-map represented the tract of country in north-east Africa from Zeila-Assab along the high plateaux of Abyssinia to Shoa, on which was traced the routes followed by Signor Antonelli and other Italian travellers. The Count was accompanied to the platform by the Galla youth *Nakariè* and the Abyssinian *Dagni*. In introducing the traveller to the meeting the President pointed out the great importance of the exploration he had conducted. Signor Antonelli had followed in his journey a line of country entirely new and had enriched science by many new facts in the topography, orography, and hydrography of the region. The line of country between the river Hawash and the Bay of Assab had been opened up by his exploration, leading as a practical result to the establishment of a direct commercial route between Shoa and Assab, which might be regarded as an essential condition of the future prosperity of the Italian colony.—Count Antonelli then addressed the meeting. He began by describing the peculiar difficulties of a journey across the Haussa, and the long and tedious negotiations required to secure the success of the enterprise. He then narrated his arrival in Hadelé-Gubd, the residence of Mohammed Anfari, Sultan of Haussa; his first reception and various interviews with the Sultan, whose goodwill he obtained, and the continuation of his journey to Shoa. He then gave an account of the condition in which he found the station of Let-Marefia and the steps taken to re-organise it. His return journey to Assab was by the same route through Haussa. He brought with him from Shoa the collections and manuscripts left by the late Marquis Antinori. He concluded his discourse by presenting to the meeting the two natives who were the faithful servants and companions of the deceased Marquis, and by expressing the hope that the friendly relations established by him would be cultivated by the Italians and turned to the profit of the country.

NEW BOOKS.

(By E. C. RYE, *Librarian B.G.S.*)

EUROPE.

Adelmann, Alfred [Graf].—Am ligurischen Meere. Die Naturpracht der Riviera di Ponente. Stuttgart (Richter & Kappler): 1883, 12mo., pp. viii. and 263, photograph. (*Dulau*: price 4s.)

Letters on Genoa, San Remo, Mentone, and other parts of the Western Riviera.

Aubert, C. F.—Le Litoral de la France de Dunkerque au Mont Saint-Michel. Paris (V. Palme): 1883, small fo., pp. xii. and 478 [no index], illustrations. (*Dulau*: price 17s.)

A profusely illustrated popular account of the northern coast of France. Some of the plates and smaller cuts (by H. Scott), are of topographical interest and well executed.

Tissot, Victor.—La Russie et les Russes. Kiew et Moscou. Impressions de Voyage. Paris (Plon): 1884 [1883], small 4to., pp. 423 [no index], illustrations. (*Dulau*: price 20s.)

Personal narrative, full of illustrations of various kinds (a few good and apparently original), and of purely popular interest.

ASIA.

Bock, Carl.—Temples and Elephants: the narrative of a Journey of Exploration through Upper Siam and Lao. London (Sampson Low, Marston, Searle & Rivington): 1884 [1883], 8vo., pp. xiv. and 438, map, coloured plates, and illustrations. Price 21s.

Although Mr. Bock does not refer to the subject in his book, it was rather an anthropological than a geographical object that led to the "exploration" referred to in his title, the chief result of which was the exhibition in London of a human nondescript called "Krao." The journey which he undertook led him from Bangkok up the Me-nam to its Me-ping head-waters beyond the Siamese and Laotian boundary, and in a north-easterly direction across the water-parting to the Me-kok feeder of the Me-kong, his furthest point being Kiang-I-sen in the Shan States on the latter river. This route took him through country of which but a small portion has been traversed by Europeans: he refers to Captain Macleod as his only predecessor (in 1837), who was however as to a very small part of the journey anticipated by Dr. Richardson. Mr. Bock on his way visited Raheng in Northern Siam (the Yaheing of Richardson and Macleod), following the Me-wang feeder of the Me-ping northwards to Lakon or Lakhon (Richardson's Lagong), then striking north-west to Lampoon (Labong), and Cheng-mai or Kiang-Mai (Zimmé). At Zimmé he left the Me-ping and struck N.N.E. to Muang Pau (or Prau), finally reaching the Me-kok at Tatong. On his return he struck the upper Me-ping to the west of Muang-Prau and below Zimmé he followed that river to Raheng.

The author regrets that he can give but meagre information on many points on which he will probably be expected to afford many details after a stay of fourteen months in this little known region, and he is careful to say that at the special request of the Siamese Government he has refrained from any political allusions. His narrative is therefore purely personal, but is naturally interesting, and would possibly have been still more so if his experiences during his anthropological researches had been given in full.

In an appendix he gives notes on the customs of the royal family of Siam, on the geography, climate, and population of the country, and on the Siamese mode of reckoning time.

The map (scale 1 : 3,500,000) shows the author's route.

Piassetsky, P.—Voyage à travers la Mongolie et la Chine. Traduit du Russe avec l'autorisation de l'Auteur par Aug. Kuscinski. Paris (Hachette): 1883, 4to., pp. 563 [no index], map and illustrations. (*Dulau*: price 12s. 6d.)

Dr. Piassetsky accompanied the Russian scientific and commercial expedition to China in 1874–75 under Col. Sosnofsky, and his account here given in a collected form with illustrations from his sketches has already appeared (in great part) in the *Tour du Monde* for 1882 (vol. xlv.). The route of the expedition was nearly due south from Kiachta viâ Urga, to Sair Ussu, and thence in a north-easterly direction across the Shamo Desert by Narun and Toli to Kalgan and Peking. The return was made by sea to Shanghai, and then past Nanking up the Yang-tse-kiang to Hankow; the Han river was then ascended to its head-waters, and the expedition struck north-west to Sin-chow on the Hwei affluent of the Hoang Ho. From Sin-chow the north-west route was continued to Lan-chow, and the Great Wall followed to Su-chow, the desert being again crossed by Hami and Barkul to the Zaisan frontier post, and the journey completed by Semipalatinsk and Omsk.

The chief object of this expedition was to explore a new trade route between Nanking and the Semipalatinsk frontier, and its supposed success was reported at the time in the 'Proceedings,' vol. xxi., at p. 448 of which is also recorded the subsequent refusal of the Chinese Government to allow the admission of Russian merchants by the road discovered to be practicable.

AFRICA.

James, F. L.—The Wild Tribes of the Soudan. An account of travel and sport chiefly in the Basé country, being personal experiences and adventures during three winters spent in the Soudan. London (John Murray): 1883, sq. 8vo., pp. xix. and 273, maps and illustrations. Price 21s.

The author, who had already made an expedition in the Bogos country and subsequently travelled up the Nile and Atbara as far as the Settite, started in December 1881 with his two brothers and Messrs. Aylmer, Colvin, and Lort Phillips, for a shooting excursion in the eastern Soudan, the chief point aimed at being the somewhat vague country of the Basé or Bazén, south-east of Kassala. Landing at Suakim, the party reached Kassala in 24 days, and worked up the Gash or Mareb river after game, striking also south to the Settite, and returning to the coast at Massowa. They were successful in finding large game (of which various interesting notices are given), but lost one of their attendants from dysentery and another from wounds received during an attack by wandering Dembellas. Various villages of the Basé people were visited; they are described as being mostly on hill-sides among granite boulders, giving rise to the story that the Basé lived in holes in the ground. Although of very evil reputation, and extremely primitive, these people were not found to be savage, but cowardly and easily conciliated; and the author gives many interesting particulars of them and their habits.

Much incidental matter of geographical value is scattered throughout the volume, which is most profusely and admirably illustrated with full-page plates, nearly all of which are of topographical or ethnological subjects. A special and original map of the Basé country is given (about 24 miles to the inch), with a general map of Abyssinia and another of Egypt and part of the Soudan.

AMERICA.

Vicuña Mackenna, B.—Juan Fernandez. Historia verdadera de la Isla de Robinson Crusoe. Santiago de Chile (Rafael Jover): 1883, 8vo., pp. 834 [no index]. Price 5 pesos = 18s. 9d.

This historical monograph of the island immortalised by Defoe contains chapters (1) on the discovery of Juan Fernández, (2) on Juan Fernández himself, (3) on the origin of the imposture by which the discovery of New Zealand and Australia was attributed to him, with other conjectural matter, (4) his work as a colonist and exciter of immigration, (5) the island in the 16th to

17th centuries, (6) on the names of Robin and Robinson in connection with the island, (7), on the different opinions as regards Defoe's work being based on Alexander Selkirk's adventures, (8) Selkirk's connection with the island, (9, 10 & 11) the doings of the Adventurers, Lord Anson, and Juan and Ulloa, on Juan Fernandez, the last chapter containing some geographically descriptive material; (12 & 13) the flora and fauna of the island, (14, 15 & 16) on its value as a strategic point or penal settlement, (17) the various great navigators who visited it, (18) its sea-lion and whale fisheries, (19 to 38) on different historical, political, and domestic events connected with the island from the 18th century to the present time, and (39) general conclusions as to its future use for sanatorial and other purposes.

Zarembo, C. W.—*The Merchants' and Tourists' Guide to Mexico.* Chicago (The Althrop Publishing House): 1883, 8vo., pp. 182, maps.

An unpretentious work, intended chiefly for commercial use, but containing probably more general information on the actual condition of the Republic than any other available book. After a general and geographical sketch and some historical data, the various States are discussed in detail, both as to physical and economical conditions. A general map showing railroads and steam-ship connections is given, with separate sketch maps of the different railroads.

AUSTRALASIA.

Monner Sans, R.—*El Reino de Hawaii. Apuntes Geográficos, Históricos, y Estadísticos.* Barcelona (Juan Llordachs): 1883, cr. 8vo., pp. 151, plan and portrait.

A slight sketch of the geography, history, and statistics of the Sandwich Islands, with a plan of Honolulu.

GENERAL.

Bordier, [Dr.] A.—*La Géographie Médicale.* Paris (Reinwald): 1884, post 8vo., pp. xxiv. & 662, maps. (*Dulau*: price 7s. 6d.)

A discussion of the influences of temperature, light, altitude, soil, fauna and flora, &c., in causing disease in man, with notices of the geographical distribution of the diseases themselves. Purely medical in aim.

[**Dutch Colonies.**—*Catalogus der Afdeeling Nederlandsche Koloniën van de Internationale Koloniale en Uitvoerhandel Tentoonstelling (van 1 Mei tot ult^o. October 1883) te Amsterdam.* Groep I., pp. i.-iv., 1-156; Groep II., pp. 1-388; Groep III., pp. 1-275 and 1-11. Leiden (E. J. Brill): 1883, 3 vols., 8vo., maps and plates.

[Also in French, as] *Catalogue de la Section des Colonies Néerlandaises à l'Exposition Internationale Coloniale et d'Exportation générale tenue du 1 Mai au 31 Octobre 1883 à Amsterdam.* Groupe I., pp. i.-iv., 1-156; Groupe II., pp. 1-368; Groupe III., pp. 1-276 and 1-10. Leyde (E. J. Brill): 1883, 3 vols., 8vo., maps and plates.

Professor P. J. Veth, of Leyden, is the editor of this extensive bilingual catalogue (the printing and paper of which leave nothing to be desired), and of which a smaller French edition has also been published. After a general statistical account of the Netherlands Indies from 1872 to 1881, an introductory sketch of the extent and importance of the Dutch Colonies is given, with references to the treaties under which some of them were exchanged or ceded. In round numbers, the Dutch possessions in the Indian Archipelago are set down as covering an area of 32,800 geographical square miles, including the Netherlands portion of New Guinea, the pretensions to which are only defined as being included in the Residency of Ternate, and limited by the 141st meridian: the West Indian possessions are set down as 2200 square miles, making 35,000 in all, and placing Holland as the second colonial power in the world. In the descriptive part of the catalogue the introductory observations on the geogra-

pical subjects (books, atlas, maps, &c.) are by C. M. Kan and the editor, and contain many bibliographical references, the exhibits themselves being usefully given in detail. The subjects of meteorological and terrestrial magnetism are in like manner treated by Buys Ballot; those on pictorial representations of local and geographical importance by the editor; on geology and mineralogy by R. D. M. Verbeek (with a coloured geological sketch map of the Dutch East Indies); on botany, by W. F. R. Suringar; on the fauna, by F. A. Jentink; and on anthropology, by F. A. C. Dumoutier. The preceding subjects form Group 1 descriptive of natural objects.

Group 2 is devoted to the indigenous colonial population, and contains exhibits and introductory observations on statistics by Dr. W. B. Bergsma and F. M. Jaeger; domestic and social life by M. T. H. Perelaer; means of existence—hunting and fishing, by Van Musschenbroek; cattle raising, by J. Lameris sericulture and useful insect products by H. J. Veth; agriculture and horticulture by K. W. Van Gorkom; forest products, mining, and general industries by Van Musschenbroek; commerce and navigation, by Bergsma and Jaeger; arts and sciences, by Dr. L. Serrurier; religion and religious customs, by the editor; and forms of government and state institutions, by P. A. van der Lith.

The 3rd Group describes the relations of Europeans with native races, containing as in the former groups prefatory treatises on the establishment and extension of European power by voyages, conquests, and treaties, by C. M. Kan; colonial systems, by P. A. van der Lith; naval and military forces, by T. M. N. Perelaer; public works, by C. L. F. Post; postal and telegraphic matters by N. L. Janssen van Raay; commerce and navigation, by Bergsma and Jaeger, D. Maarschalk, G. R. Niemann, and the editor; agriculture and industry by Van Gorkom, Bergsma, Jaeger, Van Musschenbroek, R. Everwijn, and C. L. F. Post; domestic and social life of European residents, by C. B. H. von Rosenberg and P. Heering; education, by P. A. van der Lith and Dr. T. C. L. Wijmalen; scientific exploration of the Archipelago, by the editor, C. L. F. Post, and H. Prange.

The maps are of the East Indian Archipelago, Java, Dutch Guiana, and the Curaçao group, all mere outlines.

In Dr. Kan's discussion of treaties, &c. (iii., p. 15), the following passage occurs, and may be of interest at the present time:—

“Aux Moluques et dans la Nouvelle-Guinée rien n'a été modifié depuis l'époque de la Compagnie [i.e. la Compagnie générale des Indes Orientales], et ce n'est que les décrets du 24 Août 1828 et du 30 Juillet 1848 ont défini et fixé les droits assez vagues que la Compagnie pouvait faire valoir sur les îles des Papous et sur une partie de la N. Guinée, en vertu de sa suzeraineté sur Tidore. On fixa alors au 141° méridien à l'orient de Greenwich la frontière orientale du territoire néerlandais, quoique jusqu'ici il n'ait pas été question d'assujettir les farouches Papous à un gouvernement régulier.”

[**French Colonies.**—Ministère de la Marine et des Colonies. *Notices Statistiques sur les Colonies Françaises.* Paris (Berger-Levrault & Cie.): 1883, 8vo., pp. 291.

This work, also intended for the information of those interested in French dependencies represented at the Amsterdam Exhibition, contains topographical, meteorological, geological, and other particulars of Martinique, Guadeloupe, Réunion, Ste. Marie-de-Madagascar, Senegal, the Gaboon, French Guiana, Saint Pierre and Miquelon, Mayotte, Nossi-bé, Tahiti, New Caledonia, French Cochin China, and the French establishments in Hindostan (Pondicherry, Karikal, Yanam, Mahé, and Chandernagore, with their respective dependencies, and stations at Mazulipatam, Calicut, Surat, Cossimbazar, Jougdia, Dacca, Balasore, and Patna).

[**Spanish Colonies.**—Exposición Colonial de Amsterdam en 1883. *Catálogo correspondiente á las Provincias Ultramarinas de España, publicado por la Comisión Central Española.* Madrid (Fernandez): 1883, 8vo., pp. 382.

Contains a geographical and statistical sketch of Spain, Cuba, Porto-Rico, the Philippines, and Fernando Po, not on so extensive a scale as the work on the Dutch Colonies above noticed, but containing much useful information in a handy form.

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O C E A N

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**THE INTERIOR
OF**

SOUTH AFRICA

From Lat 15° to 30° S.

Explored and Surveyed by

ANDREW ARTHUR ANDERSON, C.E.

Scale of English Miles

50

0

100

1 Inch = 57½ Miles

30

ch 34

36

Edw. Weller, Lith. Red Iron Square.



PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

Recent Explorations in the Southern Alps of New Zealand.

By the Rev. W. S. GREEN.

(Read at the Evening Meeting, January 7th, 1884.)

Maps and Section, p. 112.

THE physical geography of New Zealand has been so ably described by Dr. Haast in the Journal of this Society,* and also by Dr. Hector in the numerous reports of the New Zealand Geological Survey, and by Professor Hutton and others, that I must take for granted that its chief physical features are well known.

On turning our thoughts to New Zealand alpine exploration, we meet with a long list of names of men who have devoted their attention to its advancement, and who have added their quota to the mass of knowledge now at our disposal; men whose memories are duly perpetuated in the names of mountains, ranges, passes, and rivers. To follow the whole history of alpine exploration in New Zealand would be quite beyond the limits of my paper. To mention a few of those who have shared in the work is necessary. In the year 1858 the Austrian frigate *Novara* bore to the shores of New Zealand Doctor Ferdinand von Hochstetter, and as his assistant Doctor Julius Haast, now Von Haast. Hochstetter devoted most of his attention to the North Island, and only visited the northern portions of the South Island, where he exhumed an immense quantity of moa bones. But when Hochstetter departed in the *Novara*, Dr. Haast remained behind and was appointed geologist to the province of Canterbury and set to work at once to explore the great alpine range which has been called by Captain Cook the Southern Alps. On March 14th, 1861, Dr. Haast, with his companion Dr. Sinclair, reached the Forbes glacier at the head of the river Rangitata; this was probably the first time that human foot had ever trod a New Zealand glacier. The mountains, however, exacted a terrible toll from the explorers, for only ten days later, Dr. Sinclair was swept away to his death by the wild

* Journal B. G. S., vols. xxxvii. and xl.

glacier torrent. Time will not permit me to go into all the details of the explorations which followed, nor to tell of all the men, including Doctor Hector, the present head of the New Zealand Survey, who took a share in them. I must confine my attention to the exploration of that portion of which Mount Cook is the centre.

In 1862 Doctor Von Haast, accompanied by Mr. Arthur Dobson, again started for the Southern Alps, and on this occasion he devoted his attention to the glacier sources of the Waitaki, first reaching the sources of the Tekapo branch, in the Classen and Godley glaciers, where majestically Mount Tyndall dominates the scene. They also explored the Huxley and Faraday glaciers and returned to Lake Tekapo. "Having finished the work here," he says, "we started again on March 26th, in order to reach the river which flows into Lake Pukaki, and which would doubtless bring us to Mount Cook. . . . We then reached alluvial beds, with numerous small boggy creeks between them, and camped in the afternoon in the bed of Irishman Creek, where it issues from the ranges. Continuing our journey next morning, we ascended after two hours' march a ridge . . . from which we obtained a most extensive view. . . . Towards the west, the wild serrated snow-covered ranges on the western bank of the Tasman river, gradually rising higher and higher towards the north, were visible from the shores of Lake Pukaki to the magnificent Sefton Peak of the Moorhouse range. The view towards the Central Southern Alps became more extensive with every step, and soon Mount Cook, rising with its sharp tent-like ridge, high above all the surrounding peaks, appeared before us, and was hailed with great delight."

They then descended to the valley of the Tasman, and he goes on to say, "The valley, more than two miles broad, continued its straight course for about 25 miles, but ten miles above our position the terminal face of a gigantic glacier filled it from side to side. For more than 15 miles the eye could follow the course of the enormous ice-stream up to the vast snow-fields, and above them all, the bold and majestic form of Mount Cook stood out conspicuously. This was still more striking as this glorious mountain rises abruptly in the foreground for more than 10,000 feet above the broad valley." After fording the Tasman and then the torrent coming from the Hooker glacier, they camped at the foot of the great glacier above referred to, and to which Dr. Haast gave the name of Tasman, the first discoverer of New Zealand. Their first attempt to get on to the surface of the glacier was not very successful.

"After crossing a small stream," Von Haast says, "we arrived at such an impenetrable thicket of 'Wild Irishman' and 'Spaniards,' that after more than an hour's battling with the terrific vegetation to gain access to the glacier, we had at last to give up the attempt with our clothes torn and hands and faces covered with blood." They were afterwards more successful by a different route, and ascending the glacier for

several miles, gained a view of the next fine peak beyond Mount Cook, which they called *Mount Tasman*, and, to the broken glacier descending from between these peaks, they gave Hochstetter's name. The Hochstetter ice-fall is one of the grandest objects in the Southern Alps.

Before returning to camp they visited the mouth of a lateral valley and saw its glacier, which Dr. Haast has named the *Murchison glacier*, after the late President of this Society. Bad weather prevented them from making any further explorations on the Great Tasman glacier, but they visited the *Mueller* and *Hooker* glaciers in the next valley, and when the weather cleared they made a most interesting expedition up the great southern spur of Mount Cook. On gaining an elevation of 7500 feet on the summit of the southern spur, they found further advance along it precluded by a deep and inaccessible ravine, which had been formed by the denudation of a stratum of clay-slates from between two others of dioritic sandstone. "The view from this point," says Von Haast, "is admirable in the extreme, the bold, tent-like form of Mount Cook proper occupied the foreground, surrounded by many peaks of every conceivable shape."

After a few days' collecting near their camp they descended the valley, and so ended the first exploration of this most interesting region.

Von Haast told me that when he returned to civilisation and told the colonists that he had been on ice hundreds of feet thick they were more than sceptical. Numerous excursions to see the icy wonders of the Southern Alps followed as a matter of course, and the Great Tasman glacier became one of the recognised sights of New Zealand. Most of these excursionists contented themselves with a distant view, and those who did desire a nearer acquaintance were satisfied with the *Mueller* and *Hooker* glaciers, which are the most accessible of all the ice-streams.

In 1869 Von Haast again visited the *Tasman glacier*,* and Mr. Sealy also did much to make the world familiar with the Southern Alps. Mr. Sealy ascended the Great Tasman glacier further than it had yet been explored: I believe he reached the bend where Von Lendenfeld bivouacked, and taking with him a cumbersome photographic apparatus (it was before the invention of the dry plate process), he brought back a splendid series of negatives 7 by 8 inches in size.

All the other great glacier systems were visited by Mr. Sealy, and his photographs form one of the most interesting series of Alpine views that have ever been taken. When photographing on the *Godley glacier* (in 1871) he ascended to the summit of the watershed and looked down upon the west coast, having thus discovered the glacier pass called by his name, and having been the first to reach the dividing ridge within the limits of the snowy range.

Dr. Von Haast's opinion of Mount Cook, which may be read in his report of it in Von Hochstetter's fine work, was that it was quite inac-

* 'New Zealand Geological Explorations,' 1870-71.

cessible, and this idea, endorsed by the opinion of many who were familiar with its precipitous arêtes, added a new interest to the peak from a mountaineering point of view.

Several years ago I thought of going to New Zealand to have a look at Mount Cook, but it was not until in the autumn of 1881 that I was able to make final arrangements to do so. Knowing that the difficulties would be considerable, I engaged Emil Boss, an experienced mountaineer, and Ulrich Kaufmann, a professional guide, both of Grindelwald, to accompany me. After many vexatious delays we reached New Zealand in February 1882.

We met with a hospitable reception in the colony, and with the aid of Mr. Sealy's photographs Dr. Von Haast explained to me the general features of Mount Cook. I think there is an idea abroad in the world that Swiss guides and members of the Alpine Club are not subject to the laws of gravitation as are ordinary mortals, and that all that is necessary is to show them a so-called inaccessible precipice and up they go! No doubt there is much truth in the idea, provided a fair share of time is granted. However this may be, now that we had come to New Zealand, Von Haast showed us, on a photograph, the southern arête of the mountain, which somewhat resembles the eastern arête of the Eiger, and he said, "There is the way, and you will find no difficulty whatever."

I shall not delay you with any further preliminary details, suffice it to say that in due time we reached the terminal face of the Great Tasman glacier, 2300 feet above the sea, and pitching our camp, sent the packhorses away. We had with us sufficient provisions to last a month, provided that we kept up a supply of the game which was in abundance around us. In that month I hoped to ascend Mount Cook and to explore the Great Tasman glacier to its very source and to connect it by observation with the glacier system beyond. A long day's excursion up the glacier enabled us to see the nature of our enterprise, and impressed us with the unpleasant fact that our present camp was too far from our work and must be moved up the glacier. As the lower portion of the glacier was covered with great moraine accumulations, immense piles of angular boulders alternating with deep crevasses, the difficulty of accomplishing this move was quickly realised. However, it had to be done, and after a day spent in arranging our packs we started up the glacier. The entire load to be carried weighed 230 lbs., which we divided into five packs. The distance to be ascended was only six miles, but it took four days of hard work, and as we were stopped for two days by a very severe storm of wind, rain, and finally a fall of snow, a week was thus lost. The spot selected for our fifth and final camp was in the angle formed by the junction of the first tributary glacier with the main stream. This fine tributary glacier I named the Ball glacier, after John Ball, F.R.S., and first President of the

Alpine Club. This, our highest camp, was 8000 feet below the summit of the mountain.

Following the advice we had received from Dr. Von Haast, we made our first attempt to ascend Mount Cook by the ridge on the south side of the Ball glacier. By it we gained the main southern arête of Mount Cook at a point over 4000 feet below the summit, but found the ridge impracticable, owing to its consisting of abrupt notches and jagged teeth which were flanked by precipices. Two of my most successful photographs were taken this day, one looking down upon the Great Tasman glacier and another looking up the main arête.

Two days after this attempt, we tried to gain the northern arête of the mountain by ascending to about 8000 feet on the great pile of rocks between the Ball and Hochstetter glaciers, since called by Von Lendenfeld, the Hochstetter ridge. This day of seventeen hours involved the hardest climbing on our whole expedition, and resulted again in failure.

Once more, on March 1st, we left our camp near the Ball glacier, and ascended the ridge to the north of the Hochstetter glacier, which I have called the Haast ridge. Near the top of these rocks, at a height of about 7000 feet above the sea, we bivouacked for the night. Next morning at daybreak we struck the head of the next glacier to the northward, which I have named the Freshfield glacier, after the explorer of Elburz and Kasbek, and from its névé we reached the top of the Haast ridge and passing over it, found ourselves on the upper névé of the Hochstetter glacier, above its great ice-fall. An hour's smart walking took us across this snow-field, from which we had a most glorious view of Mount Cook and Mount Tasman, shining like frosted silver in the brightness of the morning sunshine; then reaching the glacier descending from between the ribs of Mount Cook, which I have called the Linda glacier, we followed it upwards for five hours to its source at the foot of the final peak. We met with many crevasses in the glacier, but were fortunate in finding numerous bridges of snow. From the head of this glacier to the summit of Mount Cook, which we gained at twenty minutes past six o'clock in the evening, was a very severe piece of step-cutting. The sun set about half an hour later, so we were but a short way down when night overtook us. We were compelled to halt on a ledge of rocks until morning, and at 5.30 A.M. we resumed our descent, reaching our bivouac at 1 P.M., where we rested for nearly an hour, and arrived at our camp soon after dark. Our provisions now being at an end, we were unable to make any further exploration of the glacier, and as I could not afford the time which it would have taken to fetch up another supply, we had to return after a day's rest to our lower camp and so get back to civilisation.

From the position where we bivouacked on the Haast ridge, I was able to study more of the general structure of the range than had yet been seen, and by observations taken from there and by a series of angles

taken from the centre of the Great Tasman glacier, I constructed my map, which was published in the 'Proceedings of the Royal Irish Academy.' Most of the tributary glaciers were put down fairly accurately. But I only named those which I had special need to speak of in my ascent.

Of Dr. Von Lendenfeld's expedition in March 1883, I shall now give a brief sketch. He started for the Great Tasman glacier accompanied by his young wife, who had already given evidence of her powers as a mountaineer in the Swiss Alps, and three colonists whom he engaged to act as porters. Camping, in the first instance, at the foot of the Great Tasman glacier, they worked up the glacier and pitched their fifth camp where our fifth camp had been. They then ascended to our highest bivouac on the Haast Ridge, but were unable to conquer the bergschrunds above it or to reach the Great Plateau. Von Lendenfeld thinks that there was less snow on the mountain than when I was there, and that its ascent was consequently more difficult. This was very likely the case, but I also believe that the attempt was made too close to the Hochstetter glacier, instead of by the Freshfield glacier. However, he stayed up there two days and made trigonometrical observations, and he took some fine photographs.

A few days later, they bivouacked at the foot of the Malte Brun Peak, and from there ascended to the summit of the Hochstetter Dome, at the head of the Great Tasman glacier. This was a most arduous expedition of twenty-seven consecutive hours' walking; but they were rewarded by seeing the sun sink in glory into the western ocean, and they descended in bright moonlight. The great interest of this expedition lay in the fact that Von Lendenfeld was able to map out the direction taken by the watershed of the island to the northward of the ridge, where the Great Tasman glacier begins its course. On the previously existing maps, the Classen glacier was put down as the one descending from this ridge, and so taking the drainage towards the Waitaiki on the eastern coast, the dividing axis passing along from Mount Beaumont through the Hector range to Mount Tyndall. Von Lendenfeld now places the watershed to the eastward, and has well named the great glacier which he discovered beyond the Hochstetter Dome, the Whymper glacier. The Whymper glacier descends towards the west coast and is the source of the Wataroa. The topography of the Hector range being therefore slightly upset, it would be well if some expedition were started to put it straight. As we were unfortunately caught by bad weather when on the upper crest of Mount Cook, we were only able to get one glimpse of the west coast, and I only made a hasty sketch of the peaks to the northward of the Tasman system. Dr. Robt. Von Lendenfeld has given names to all these glaciers and peaks on the excellent map which has been the outcome of his explorations, and which is in many points more accurate than mine.

Of the differences between his map and mine, it is unnecessary that I should speak in detail. Two points only I shall touch upon. (1) He makes the Great Tasman glacier narrower than I represented it to be, and he throws Mount Cook farther back from it, thus making the length of the tributary glaciers from Mount Cook greater. In this I believe he is quite correct; he had with him a theodolite, and I had not, and when I came to connect my angles I found a difficulty in the case of Mount Cook, which I met by increasing the width of the glacier instead of allowing it to stand and throwing Mount Cook farther back from it.

(2) The ridge called after Dr. Haast is represented by Von Lendenfeld as being connected with Mount Cook, and dividing the Hochstetter glacier from the Linda glacier, which glacier he makes continuous with a glacier which I had left unnamed, but have since called the Freshfield glacier. The Haast Ridge is really a spur descending from a peak to the north of Mount Tasman, and divides the Hochstetter glacier, and its tributary the Linda glacier, altogether from the Freshfield glacier, which takes its rise on the eastern slope of the ridge.

The western slopes of the Southern Alps are difficult of access, owing to the fact that there is no regular means of communication along the coast south of Hokitika, and the rivers descending from the mountains are so numerous and the forest so dense, that land travelling is difficult. Some portions of the coast have been minutely examined by the members of the Geological Survey. Dr. Hector thoroughly explored the Arawata river to the glaciers of Mount Aspiring; Von Haast the river and pass which have been called by his name. The Haast Pass is the lowest pass through the Southern Alps. Haast also visited the lowest termination of the Francis Joseph glacier, which descends to within 705 feet of the sea-level, and he mapped out several others which bring down the ice from the western precipices of Mount Cook and the neighbouring peaks.

In the year 1876 Mr. S. Herbert Cox and Mr. McKay, of the Geological Survey, again visited these western glaciers, and after reaching the lower termination of the Fox glacier, which they found was only 670 feet above the sea-level, they ascended the western spurs near Mount Cook to a height of 5000 feet. Their geological observations were most interesting, and this brings one naturally to the consideration of the geological structure of the whole of this magnificent chain of mountains.

To the west of the Southern Alps, and parallel with their axis north and south, there appears a long upheaved ridge of granitoid rocks, the newer formations dipping from it east and west. This granite, the outcrop of which comes further inland and occupies a wide area in South-west Otago, may be looked upon as the foundation of the whole New Zealand series. Neglecting the deposits on the western slopes of this granite ridge, we meet with, on its eastern slope, a great metamorphic formation, the upper strata of which consist of quartzites, and on top of this a great thickness of slates and sandstones, with interstratified

leds of ash, breccias, &c., called by Mr. Cox the Matai formation. This great formation forms the chief part of the highlands of Canterbury, and where it can be traced for about 70 miles to the eastward. In rocks which have been referred to the cretaceous age we meet with the first important unconformability to these older rocks, and these are again covered with tertiary formations down to the glacier deposits.

According to Mr. Cox and other authorities, the greater portion of the Alpine peaks to the north of Mount Cook consists of rocks of the Matai series, and that these rocks form the summit of Mount Cook has been concluded from the examination of the rocks forming the moraines of the eastern and western glaciers in the vicinity of Mount Cook.

All the existing diagrams agree in representing the section through Mount Cook as similar to the accompanying section taken from Mr. Cox's report. I am hardly in a position to question the accuracy of this diagram, not having had experience of the West coast formations; but my belief is that the peak of Mount Cook consists of rocks of the metamorphic formation, and that the slates and sandstones of the Matai series end on the lower eastern spurs. My reasons for coming to this conclusion are that on our three ascents of the lower spurs we met with hard slates and more or less friable reddish and yellowish sandstones; but on reaching the main peak of Mount Cook we found it composed of quartzite. The specimen I brought home was the very topmost rock just appearing below the cap of ice which forms the summit.

That the rocks of the main peak should not be recognised in the Tasman glacier moraine may easily be understood when it is seen that by far the larger portion of rocks composing these moraines fell from the exposed precipices of *the spurs*, while the higher rocks are more protected by glaciers. The rocks of the summit of Mount Cook dip to the westward at an angle of about 30° , but this may be only a local flexure, as the general view of the strata gives an easterly dip. If I am correct in my statement that the summit of Mount Cook consists of rocks of the metamorphic formation, the fact of Matai slates and sandstones being found on the western glaciers must be accounted for by the supposition that these rocks strike through the watershed a little to the north of Mount Cook, possibly near the peak called by Von Lendenfeld the Haast Peak. The gold-diggings of the west coast are in the deposits produced by the washing down of the rocks of the Southern Alps, and possibly a rich quartz reef may yet be struck amongst the snows. Passing from these older geological questions, the tertiary formations of New Zealand abound in interest. Nowhere can the phenomena of a great glacier epoch be studied to greater advantage, ancient moraines and lake terraces being numerous. The three lakes, Tekapo, Pukaki, and Ohau, to the east of the highest range, have evidently been formed by dams of old glacier deposits, and the Murchison Valley presents us with an illustration of how such lakes may be formed; for the east lateral moraine of

the Great Tasman glacier has so nearly stopped up its opening that a good landslip from the mountain side is all that is necessary to completely dam back its drainage.

The only portion of the Southern Island which may now be looked upon as unexplored is that narrow belt of mountain and forest land lying between Lakes Manipori and Te Anau, and the west coast.

This would be an interesting field for further explorations, as though many attempts have been made to pioneer a route from Milford Sound to the inhabited district to the eastward, this route yet remains to be discovered. To the naturalist this region is particularly interesting. New Zealand possesses, as is well known, a most remarkable bird-fauna. The fossil remains of the various species of *Dinornis* are to be seen in most museums. The bones of a large rail (*Notornis*) were often found with the bones of the dinornis, and both birds were supposed to be extinct. However, in 1850 a specimen of the notornis was captured at Dusky Sound, and may be seen figured in Buller's fine work on New Zealand birds, and since then two more specimens have been secured. These three specimens are all that the world possesses of this rare and remarkable bird.

Dr. Otto Finsch, who visited New Zealand in 1881 for the purpose of observing its birds, heard two men describing to Dr. Hector what they believed to be the moa, as having been tracked by them on the snow. Dr. Finsch makes no comment on the story, neither do I. There is still, however, a chance, though a slender one, that the exploration of the south-western parts of New Zealand may render some remarkable results. I visited both Milford Sound and George Sound, and the general aspect of the district consists, first, of a belt of forest extending upwards on the precipitous mountain sides to a height of some 2000 feet; then, where it is possible for anything to grow, a region of coarse grass supervenes, above which rise the snow-seamed crags of the Sound ranges. Wherever they attain an elevation of 5000 feet they are capped with perpetual snow, and in some cases true glaciers fill the ravines, though none of the peaks are much above 6000 feet. The traveller who explores this region must be ready to face the unpleasantness of constant wettings. He must be provided with axe and billhook or cutlass to hack his way through the vegetation, and if he wishes to study its avifauna, he must be accompanied by a dog.

From a picturesque point of view the New Zealand alpine scenery is very grand; perhaps the Great Tasman glacier is a little too big for the peaks which surround it. Any scene on it would hardly compare with those on the Mer de Glace below the Tacul, but it might fairly enter into competition with the view looking up the G6rner glacier, or that on the great Aletsch glacier in the Oberland. Von Lendenfeld thinks that I overrated the scenery; perhaps I did, for I so thoroughly enjoyed all that I saw that I may have forgotten to be critical. However, his

criticism that there was not anything to compare with the Eiger, as seen from Grindelwald, is hardly to the point. Neither he nor I were in a position to see views of that description. The eastern side of the Southern Alps is the less precipitous and compares with the Aletsch glacier side of the Oberland. It is on the west coast, where the great precipices of the mountains shoot aloft for 10,000 feet, that the Eigers and Wetterhörner of Australasia will be found; and when we consider that the zone of glaciers on the western slopes has a depth of no less than 11,000 feet, and that the peaks rise out of dense forests and groves of arborescent ferns, we surely have conditions which must place the scenery of the Southern Alps in a foremost place amongst the loveliest landscapes of the earth.

In his introductory remarks the PRESIDENT said that during the period, exceeding three years, that he had had the honour of being President of the Society, no paper had been read on the subject of New Zealand: Mr. Green's address would therefore come before them with all the freshness of novelty. Some years ago Sir George Bowen, one of the most distinguished members of the Society, then Governor of New Zealand, invited the Alpine Club to send one of their members to explore the mountain regions of that country, and offered certain advantages and assistance to those who would undertake the task. Several years elapsed before anybody accepted the offer. At length Mr. Green did so, and although he was exposed to various obstacles which diminished the amount of time at his disposal, he succeeded in accomplishing a very considerable work, and ascended the highest mountain in the island, Mount Cook (12,350 feet), exploring a glacier larger than any in the Alps. Mr. Green was an active and enterprising member of the Alpine Club, which had furnished not only men of great physical daring and adventure, but also men of very considerable scientific attainments. It was to that club that was due the enterprise of men like Whymper and Ball, who, having explored pretty nearly every height in the Alps, had turned their attention to the Andes and the Atlas, and the late lamented Mr. Hinchliffe, whose published travels so many had read with interest. These men possessed not only the daring spirit which turned "what some deem danger to delight," but also a power of accurate description from which geography had greatly benefited.

After the paper,

Professor BONNEY said it was almost unnecessary for him to point out that the expedition up Mount Cook, which Mr. Green had passed over so lightly, was one of no common danger and daring. It appeared that he had to run risks which were not very frequently undergone in the Alps, and the conclusion that he (Professor Bonney) drew from reading Mr. Green's book, was that New Zealand was not altogether to be recommended as a place for mountaineers. The weather of the Alps was not good, but the weather of the New Zealand mountains appeared to be infinitely worse, and it seemed to him that there was a serious addition to the dangers from the excessive precipitation which must take place upon the higher parts of the mountains. Mr. Green had spoken of the avalanches not being silent during all that night which he passed on the side of Mount Cook. No one could be surprised at that, when it was remembered that the rainfall on the western coast was something like 113 inches. That evidently must mean a very considerable snow precipitation on the higher mountains, and additional danger in the ascents. With regard to the geology of New Zealand, on looking at the admirable wall-map then before him, which in many respects reminded him of the Scandinavian

Peninsula, he was struck by the two parallel lines of depression, which seemed to run on either side of the great mountain chain, the one indicated by the great series of lakes (he did not believe in the glacial erosion of lakes) which ran through Canterbury Province down to the Te Anau Lake; the other indicated first of all by the proximity of the sea to the western flanks of the mountains, and then by the extraordinary congeries of sounds or inlets, which were most frequent in the neighbourhood of Resolution Island. It seemed to him that these two parallel lines of depression ran together near Resolution Island. He had not had the opportunity of examining any of the specimens which Mr. Green had brought home, and therefore could scarcely venture to speak of the geology of the district; but assuming that the word "metamorphic" was used in its strict sense, he should suspect the actual form of the mountain range to be a faulted anticlinal, and that the granite was probably not true granite but one of those granitoid rocks which appeared to be the foundation stones of the world in every place where the geology had been thoroughly worked out. To this would probably follow the metamorphic series at a considerably subsequent period; and next a line of unconformity, after which would be the slates and sandstones and the rest of the Matai series, the age of which he believed was known. It would therefore follow that there probably had been earlier periods of land in that district, and very likely on the surface of the metamorphic series an old line of denudation would be found. That however was only speculation, because he had not as yet seen a single specimen from the country.

Mr. DOUGLAS FRESHFIELD said that as a member of the Alpine Club he must thank Lord Aberdare for the allusion he had made to some of its old members in introducing the subject of to-night's lecture. That Club is now a prosperous and yearly increasing body, and in correspondence on the Continent with foreign clubs of a similar nature, which number their members by thousands, and issue numerous and important maps and publications. Having thus spread over Europe, and explored most European mountains, it has naturally sought to extend its sphere of action to more remote regions. Both the Club and Mr. Green were, he thought, to be congratulated on the results of the first expedition undertaken by one of its members and Swiss guides to the Antipodes. He trusted that this missionary of mountaineering might prove to have opened the way to a thorough examination of the magnificent range named by Captain Cook the Southern Alps, and to have added to the lives of Australasians a new and health-giving pursuit. Results interesting in different ways to science could not fail to follow from a complete exploration of the New Zealand Alps. The Alpine Club, he knew, had been accused of neglecting science. Its members have been supposed to adopt as their motto the lines of the Poet Laureate—

" We love the glories of the world,
But laws of nature are our scorn."

And this is so far true, that some climbers have broken with complete success certain so-called laws of nature which prove to be but guesses of the laboratory. But he thought Mr. Green had said enough to show that a climber may hold science in respect and know how to observe. On the various aspects of the Southern Alps Mr. Green had brought before the Society, there must be many members present more competent to enlarge than he was. He had been struck by the narrowness of the zone along which the elevating forces have worked, and by the interruptions of their energy, indicated by such a gap as Haast's Pass, only 1000 feet above the sea-level. Then as to the extension of the western glaciers to within 700 feet of the waves. This shows that there must be large névé basins on the western side of the watershed, and a great snowfall to fill them. The steepness of the lower slopes may also contribute, for ice, once past the limit where waste begins, will get down lower if it

falls on a rapid than on a gentle slope, since the latter involves a longer journey, and therefore a longer exposure to waste before the lower level is reached. The higher snow-level on the western side might be accounted for by the rapid action of warm winds on exposed slopes. But he must pass on from Mr. Green's immediate subject; for he had to ask the attention of the meeting for a communication linked with Mr. Green's, not only in being a record of mountain travel, but also in being the continuation of the adventures of his Swiss companions. Those brave fellows, Boss, the landlord of the *Bär* at Grindelwald, and Kaufmann, had been for the last eight months travelling in the Himalayas with a young Englishman, Mr. W. W. Graham. As they had already learnt from the 'Proceedings,' they first visited the Kumaon district near Nynce Tal, where they met, owing to various causes, with only partial success, succeeding, however, in surpassing the highest point previously attained, the late Mr. Johnson's highest, 22,300, by 200 feet. Thence they proceeded to the Kinchinjunga group. He would now read Mr. Graham's letter, written to the editor of the *Alpine Journal*, from Tumlong, in the heart of Sikkim, without further preface:—

MR. W. W. GRAHAM'S ASCENTS IN THE HIMALAYAS.

TUMLONG, SIKKIM, *November 11th, 1883.*

"The simple truth is that all the Himalayas are much more difficult than the average Alpine peaks. For instance, in Kumaon, out of eighteen peaks exceeding 20,000 feet, I have no hesitation in pronouncing ten impossible. These ten peaks stand up as black as night, no snow resting on any of their sides. Well, I was rather disgusted at our failure on Nanda Devi, which I still believe to be possible, and so we all came up in September to try our luck in Sikkim. The weather was miserable, rain and snow every day, and it was only at the end of the month that we got a chance for anything. We then had fair success, climbing four peaks, all pretty high. The first two are unnamed; one, the most western of the range, is 19,300 or 19,400. The next, south of Kinchin, is about 20,000 feet, but the measurement is not quite certain. The third, Gubour, is in the Pundim range, and is 21,300 feet, whilst last, but not least, came Kabru itself, 24,015. This last is, I think, by far the highest ascent yet recorded. It was not what I should call really difficult, but very dangerous, as it can only be climbed after a fall of new snow. The last 2000 feet are pure ice, and of course, unless there be a coating of snow on, which only lasts a few days in this heat, no man could cut steps up in a day. Gubour was by far the most difficult ascent, but quite safe, though I got a touch of sunstroke on the way up. There is one thing I have not been quite able to understand. In none of these ascents has any one of the three felt the slightest inconvenience from rarefied air. Whether the reduced pressure on the body balances the extra lung-work I do not know, but a very loud and perceptible beating of the heart is the only effect noticeable.

"Now, what will interest you more is the question, what can be done in the future? As regards Kinchinjunga, I do not call it impossible, but improbable in the highest degree. The peak runs east and west like a wall, the two arêtes being the most frightful imaginable. From the south nothing but a fly could make the ascent, as it overhangs in two or three places. From the north it is one continuous slope of rock and ice at a mean angle of 50°, and more than 15,000 feet of rise. I see no possibility of sleeping there, and such an ascent would demand at least two days' very hard work. Gunnoo, 25,300 feet, is, I think, possible from the east, but there is an enormous glacier, at least 20 miles long, to be traversed before reaching the arête, and even when there, it will be very difficult. From west and south the peak is obviously impossible. Pundim (22,000 feet) we examined very carefully, and owing to overhanging glaciers could see no possible route. The same applies to Nursingh (19,100).

This exhausts the peaks in the Sikkim group, and shows, I think, the quality of the range. It is my deliberate opinion that out of, I suppose, nearly 100 peaks that I have seen, *not one* do I think possible from the south.

"We are now on our way to the peaks north-west of Bhutan, Chumularhi, Donkia, and others, between 23,000 and 24,000 feet. By the way, I believe that Mount Everest will have to take a lower rank. From the western peak we climbed, west of Kang La, we had a glorious view, and two peaks north-west of Everest are, we were all agreed, considerably higher.* Pity on the miserable policy that allows such a glorious country to be absolutely closed to Europeans.

"The climate here is considered very unhealthy, and we lost several coolies from fever, but we ourselves have enjoyed wonderful health. I have secured a few photographs which, though not good, owing to the great damp, still show something of the peaks. The greatest drawback is the weather, which gives no season at all, but only short spells.

Nov. 14th.

"I had no opportunity of sending this off before, so will add a few lines. The winter set in with heavy snow, driving us back just as we had reached the foot of D 3, a very fine peak. I have thus had a full year's season in the range, and can speak with a certain amount of experience. What with the endless trouble with coolies, the difficulty not only of reaching the peaks, but of keeping up your supplies when there, and the extreme unhealthiness of the country, I do not think that Sikkim forms an inviting field for the climber. What is worse is that there is no season at all. February, March, April are not only too cold but too wet for the higher peaks. May, besides fearful storms, is the avalanche month, and is also so unhealthy in the deep valleys and gorges through which the route lies, that I doubt if any coolies could be induced to go. In June the monsoon sets in and rages till the end of September, all climbing being out of the question during this period. From October onwards the weather is fine but cold, and, as a rule, the snow begins about the 10th or 15th. Thus there is rarely more than a fortnight during which one can be said to have decent weather.

"Of Kumaon which, I think, offers a much finer field (although the peaks are lower), I can only give my own experience during June, July, and half August, and that was wet and dense mist almost every day. Being considerably north, the snows melt later and begin earlier than here, but I believe that September is, as a rule, fine and warm. Moreover, there is a fair quantity of game, which is not the case in Sikkim.

"The coolies are very inferior, however, being Hindoos and of poor physique, whilst here they are powerful men. Buddhists will eat anything, and I really believe that, could you trust them in the slightest, some might be trained into very fair guides. Certainly no two men alone will climb these peaks; two guides are absolutely necessary. Hoping that this information, though scanty, may be of some service,

W. W. GRAHAM.

"P.S.—I have just heard that Mr. W. Roberts, one of the most enterprising surveyors in the Survey Department, has climbed Donkia. He has not yet returned from his survey, but natives coming in have brought the news. The peak is 23,180 feet, and of the most formidable appearance.

"P.P.S.—I also learn from Mr. Ryall, one of the heads of the Survey Office, tha

* The peaks are said by Mr. Graham, in a second letter, to be situated on the watershed between the basin of the Arun river and Tibet, and about 50 miles farther than Mount Everest from his standpoint.

owing to taking the coefficient of refraction 1-10th instead of 1-20th, the peaks are probably much higher than their present calculated height, i. e. he thinks Mount Everest is 29,500 feet, and so on. This, however, is at present uncertain."

Mr. Freshfield in conclusion said, two points suggested themselves for comment in this; the alleged discovery of mountains higher than Devadunga, or as it has been renamed by surveyors, Mount Everest, and the fact that three men reached 24,000 feet without suffering from the rarefied atmosphere. As to the former, the first feeling would probably be—his at least had been—incredulity. But on reflection and examination he found that the peaks seen north-west of Everest by Mr. Graham and his guides from their eyrie on the western spur of Kinchinjunga had probably never been seen by Europeans before—certainly not measured. There was therefore no antecedent improbability in their report, and he could confidently say, from a fairly large experience, that from high elevations mountains show themselves in their true relative proportions and that the common impression of three trained mountaineers on such a point was much more likely to be right than wrong, particularly when the mountain that looked the loftier was also the more distant. And he had had that day an opportunity of consulting a member of the Council, General Thuillier, formerly at the head of the Indian Survey Department, who had informed him that he had always considered it not only possible but probable that peaks higher than Everest would be found exactly in the district where Mr. Graham thinks he has seen them. As to the rarity of the air, a very distinguished Frenchman, M. Paul Bert, some few years ago informed us that at 6000 metres man would become incapable of exertion and, a little higher, incapable of breathing. He got this result by experiments on himself in an artificial atmosphere. Such fancy experiments must yield to real ones. He (Mr. Freshfield) had always felt convinced that philosophers had overlooked the extent to which training and habit can extend in this direction the capacity of individuals. Mountain sickness has in this many analogies to sea-sickness, and a study of sea-sickness which left out sailors would hardly be satisfactory. And considering how much more gradually the rarity increases between 20,000 and 30,000 feet than it does at inferior levels, he had every confidence that the highest mountain in the world will (if nature has not forgotten a ladder to it) be some day trodden by human feet.

The PRESIDENT in proposing a vote of thanks to Mr. Green for his interesting paper, said that no one could have listened to the account of his exploration without a glow of patriotic satisfaction. Although New Zealand was discovered by a distinguished Dutch navigator, Tasman, it was also indissolubly connected with the fame of Captain Cook, and had been for many years an English possession. Grateful as they ought to be to men like Von Haast and Lendenfeld, they would have felt a pang of humiliation if the highest point of the island had been first reached by any one but an Englishman. The feat had been accomplished by Mr. Green, who had shown himself competent to describe scientifically the geological features and character of the country.

A Boat Journey round Stanley Pool.

By the Rev. T. J. COMBER, F.R.G.S.

ENCLOSED I send you a sketch-map which I have made on returning from a boating trip round Stanley Pool. We may hope soon to see this lake-like expanse of the Congo properly surveyed, but at present very little is known about its real extent and character, and the present sketch may therefore be found useful.

In Mr. Stanley's map, published in his book, 'Through the Dark Continent,' the Pool is given as a sudden broadening out of the river, from two to seven miles wide and about nine miles long, after which it is represented as suddenly contracting where it rushes down through a two mile channel over the Ntamo Cataracts. But Mr. Stanley had not then (nor has he since) been round the piece of water to which his name has been given. The little trip I have made round it has been the first circumnavigation, though not a complete and thorough one. The natives on the shores of the Pool are not by any means unanimously in favour of the presence of white men, and we did not feel it advisable, in this preliminary tour of a missionary boat, to hug the shore, and thread the narrow channels inside the sandy and grassy islands which line it. In the present inimical disposition of the natives an attack would have been very likely, and although we might be ready to defend ourselves, we did not wish to have to do so.

The result of our rough survey gives Stanley Pool a length of 23 miles, and a breadth of equal amount; it includes an area of about 350 square miles instead of Stanley's 55 or thereabouts.

The position of Kintamo (at which are the European settlements of Leopoldville) is, according to Mr. Stanley, long. 15° 44' 30" E., lat. 4° 13' 20" S. From this point bearings have been taken by prismatic compass of the following places: Mfwa, Mfwa Point, Mpila, Mpiete Point, the upper entrance, right bank, the east and west points of the large island, Mbangu, Nshasha, &c.

On the 18th ult. Mr. Bensley (my colleague) and myself, accompanied by Dr. Sims, of the Livingstone Inland Mission, left here in our steel sectional boat (tender to our new steamer *Peace*) with the intention of circumnavigating the Pool as far as possible. As it happened, on the day of starting, there arrived at Mfwa (Brazzaville) four Europeans of M. de Brazza's staff, and not being sure of the reception they had met with, and the state of the people's feelings, we simply sailed by the town of Mfwa and steered for the prominent hill of Mpiete, skirting along the low islands. To reach this place took us a full day, and we slept on an island near by. Behind the point of Mpiete, a fine wooded spur about 350 feet high, we reached the Dover Cliffs; and found them not to consist of chalk, as Stanley thought when he looked at



A. Low sandy Islands with tall grass, Borassus Palms occasionally Bamboo & Papyrus.

STANLEY POOL
M. Comber's Route.....→

- x Station of the African International Assocⁿ
- " " Baptist Missⁿ Soc^y
- " " Livingstone Inland Mission.

them from a distance, nor pipeclay as he has thought since, but *sand*; the whitest silver sand, varied occasionally by an admixture of brown sand, and here and there by black masses of forest, which by contrast add to the beauty of the cliffs. Dover Cliffs are about 200 feet high, and are cut up in a most fantastic way by the floods of the rainy season. The rains above, and the river deep and fairly strong at the foot, eating away under the cliff, have evidently caused some fearful avalanches of this white sand. Riven and torn into strange shapes, the sand rears itself in lofty columns and pinnacles, has its castles with their buttressed walls and towers, and presents a magnificent sight.

Not thinking of possible danger we approached the foot of the cliffs, and got on shore, but immediately sank knee deep into the treacherous yielding sand, which was very loose and sloppy. Finding the footing thus unsafe, and seeing the towering detached columns of sand, almost direct over our heads, we thought it best to content ourselves with merely taking specimens of the sand, and to go on our way.

In the afternoon we got abreast of the entrance of the Pool, which is about $2\frac{1}{2}$ miles across, and flanked by grand wooded hills with occasionally green slopes bare of trees, to the height of from 400 to 500 feet. Sailing across below the three small islands of the mouth, we came down quickly with the stream past the village of Kimpoko, and slept on an island opposite the large town of Nkunga. Crossing over the following morning to the islands which line the southern shore, we entered into one of the inner channels, and winding among the grassy islets we quickly passed the towns of Ndolo and Nahasha, and arrived at the station by 2 p.m. on the third day.

The current is fairly strong in the Pool, averaging about 3 knots. In going up we of course kept close to the banks, keeping in the strong water in returning. In turning the corner at Nshasha, the islands opposite which are rocky, the water rushes along as if through a sluice, being broken here and there by rocks. Navigation here of course requires care. A little below Nshasha is a point off which sometimes runs a very strong current, and which is called Kalina Point from a sad tragedy which occurred last December. An Austrian officer, M. Kalina, attached to Mr. Stanley's party, was drowned here by the capsizing of his canoe in ascending the river. The boat was overloaded, and the unfortunate officer was heavily accoutred, with thick shooting boots, and was imprudently sitting on the top of his boxes instead of low down in the canoe. On reaching this point the current capsized the canoe, and all the occupants were swept and whirled along into the middle of the river. M. Kalina soon sank; some five or six of the people were seen by us struggling in the middle of the Kintamo Rapids, but they disappeared before they reached the cataracts; three men, however, managed to get close in shore in Kintamo Bay, and were saved. Two other Europeans of Mr. Stanley's party lost their lives in a similar way

close by the Ibari Nkutu or Kwa river. These were Lieutenant Janssen and Abbé Guyot of the Algerian Mission. Only yesterday, a canoe with five Houssas of Mr. Stanley went over and was engulfed by the cataract, the occupants not understanding the force of the current. Even in Kintamo Bay the current is strong and one has to be careful.

The Pool is full of islands, chiefly of sand overgrown with tall grass, Borassus palms, and occasionally a species of bamboo resembling, but not growing so thick as, the Indian species. On the islands of the southern bend we found papyrus, which I had not seen since leaving the neighbourhood of Manyanga. Lying along the centre of the Pool is a great island about 17 miles long, covered with thick forest, and uninhabited save by elephants, buffaloes, and other game. Plenty of channels are found between the islands, some of them very broad, as the map will show. Those to the north-west of the island are uncertain, and there is danger of constantly running upon sandbanks. Close to the large island, however, the channel is probably deep and good. The best course is to steer along the south-east shore of the large island.

Game is abundant, especially hippopotami and birds. During our three days' journey we saw several hundred hippopotami, generally in herds of from ten to twenty. At first they did not take the trouble to sink down, but a shot fired at them made them more wary, and they would rarely permit a second shot unless fired immediately, while they were confused. None of them ventured to attack our boat, although it was such a strange object in the more unfrequented parts of the Pool. An enormous crocodile, however, with head out of water, made a savage rush at our boat from a distance of 50 yards; at 15 yards a Martini bullet stopped him and he disappeared. For a crocodile to attack a boat is so strange, that at first we thought it was a log of wood fastened to some net, and past which the current was rushing; as it approached nearer we thought it must be a hippopotamus (so big and broad was its head), but it proved to be a crocodile.

Wild ducks abound in small flocks of three to ten. Solitary, tall, soldierly birds (a species of adjutant), looking of exaggerated size in the refraction of early morning, stalked about the sandbanks, always alone. We have at the present time one of these enormous birds at our station, who walks about swallowing anything that has the taste of fish or flesh. Even a dead monkey did not come amiss to him the other day, but went down his enormous gullet *whole*, only the tail causing inconvenience as it hung outside his bill. Pelicans are frequent in their V shaped flocks of twenty or thirty. Scissor-bills, with coral-like beaks and feet, are found in flocks of one or two hundred.

Hills varying from 50 to 500 feet, and generally forest-clad, surround, with few intervals, the whole of Stanley Pool. Especially picturesque and grand are those which flank the upper entrance. The hill at Kintamo, where are the European settlements, is over 200 feet in

height. On its slope, at a height of about 50 feet from the river, Mr. Stanley has cut an imposing terrace on which the African International Association houses are built. The Livingstone Inland Mission has its buildings at about the same height from the water, but nearer the native town of Kintamo. This station of the Livingstone Inland Mission is stated merely to be a steamer depôt. Our station (Congo Mission, Baptist Missionary Society) is built on the top of a hill and commands a magnificent view of the Pool and surrounding country. Between Leopoldville and Lema to the south and Mbangù to the east the country is almost a dead flat, being about 20 feet only above the river. At Mfwa (Brazzaville) and towards Mpila there is a stretch of table-land (said to be very swampy) about 100 feet high, backed by hills upwards of 300 feet high.

One of the things that most struck us in going round the Pool was the paucity of towns and people. After passing Mfwa and Mpila we saw but one or two canoes until in our return we drew near to Nshasha. An abandoned farm on the hill called Mpiete; a few houses showing among some trees just past the Dover Cliffs; a town or two (said to be small) near the entrance on the south bank; Nkunga, Mbangù, and the towns of the Nshasha district, seem almost to complete the population of the banks of Stanley Pool. Nkunga and Mbangù are said to be large towns. Lema too, a little way inland and south of Nshasha, has the reputation of being very populous, and a great ivory mart. Nshasha has several large towns, with the people of which we have long been on visiting terms, and where Mr. Stanley has an outstation. Kintamo (at our feet) has a population of about 1500 people. Mfwa, opposite "Brazzaville," is a cluster of four or five small towns.

The new steamer built for the use of the Congo Mission of our society (the *Peace*) has been conveyed in sections from the coast to our station, and is now almost all here. Next month her reconstruction will probably commence. It formed about 800 loads complete, which have been brought up by natives; to such an extent has native carriage developed, that upwards of 300 loads have been brought from Manyanga during the last month. This largely does away with the necessity of imported carriers, such as Krooboys and Zanzibaris. We are hoping soon to make a much more extended journey in our little steel boat. Mr. Stanley's last reported station is at the confluence of the Ikelemba, and he is probably now in the country of the Bamangala.

Arthington, Stanley Pool, October 6th, 1883.

Dr. Fischer's Journey in the Masai Country.

At the meeting of the Hamburg Geographical Society, held on December 6th, 1883, Dr. G. A. Fischer appeared before the Society, at whose instance and expense he had explored the territory of the Masai in East Africa, hitherto untrodden by the foot of the white man, and gave an account of his journey. The following is an abridged report of his paper, translated from the *Hamburgischer Correspondent* of December 11th, a copy of which Dr. Fischer has kindly sent to us:—

Dr. Fischer began by giving a brief review of the earlier journeys made in the region of the snow-covered mountains of East Africa, the existence of which had been for a long time doubted by the greatest authorities. While the earlier travellers followed a more northerly direction, Dr. Fischer elected to start from the district of Pangani, which is situated a little to the north of Zanzibar, and he followed practically the course of the river of the same name. Pangani is the chief place from which caravans start for the Masai country, while Mombasa, which lies farther north, serves as a starting-point for the territories of U-kamba and Kikuyu, especially since the time some years ago, when a caravan which had started from there was completely annihilated by the Masai near Lake Naivasha. It was therefore natural to suppose that in Pangani were to be obtained porters, at once the most experienced and qualified for a journey into the Masai country. Of the Zanzibar carriers, who are generally preferred by Europeans on account of their greater trustworthiness and honesty, only a few offered themselves, and these, taking into account the fact that the Masai land is one of the most ill-famed in East Africa, demanded such high wages, that the difference in enlisting these had to be considered. For the further reason also these Zanzibar carriers were not to be recommended, at least not in great number, viz. because they were not familiar with the habits of the Masai, nor accustomed to the mode of life to which porters here are constrained. Dr. Fischer therefore engaged his porters at Pangani. The party soon settled down together, although composed of the most diverse elements—slaves, freedmen, free negroes from the Wa-digo, Wa-segua, Wa-ngu, and Wa-shensi tribes. Thus 120 men were collected, but this number was not sufficient, especially as desertions had to be taken into account. And so, since the resources placed at the traveller's disposal for scientific purposes did not admit of a greater number of men being engaged (each porter receiving from 30 to 32 dollars), Dr. Fischer resolved to advance goods out of his means to ivory traders who engaged to accompany him and follow his directions, and in exchange for the goods advanced to hand over on their return a fixed quantity of ivory. In this way a caravan numbering 230 men was formed, which was sufficient for all eventualities.

About the end of December 1882, Dr. Fischer quitted the coast, but was compelled to spend a month in the country of Maurui, which is situated a day's journey up the river, before the whole caravan was compactly arranged and ready for the march. The inhabitants of this district, the Wa-luvu, are closely related to the Wa-segua, and inhabit only a tract of country along the banks, and more particularly the islands of the Pangani river. On these islands they are secure against the attacks of the Masai, who extend their plundering expeditions as far as the coast and very often pay a visit to the Wa-luvu, who, besides being agriculturists, are cattle-breeders. Thus, following the course of the Pangani river, the coast regions which are more luxuriant as regards vegetation, were left behind, and the march was continued through a steppe land more or less wooded, with its acacias, mimosas, euphorbias, and aloes. The region lying between the Paré chain of mountains and the river Pangani is uninhabited. On the slopes of the former dwell the Wa-paré, who are agriculturists, and the caravan was compelled to visit them for the purpose of obtaining vegetable food. Common salt and ferruginous sand were found here. After crossing over to the right bank of the Pangani, the country of Arusha, inhabited by the Wa-kuavi, was reached. The district is watered by a number of little rivulets which, coming from the snow-covered Kilimanjaro, feed the Pangani river. The Wa-kuavi, a pastoral and nomadic race like the Masai, formerly possessed the greatest part of the land, now inhabited only by the Masai, but were gradually driven back by the latter, until at last, in a great battle which took place six years ago, they were completely overthrown, and fled away to the Samburu Lake. They are now only found in a few places of the Masai territory, where they have settled and pursue agriculture; hence they are met with in the two Arushas, on the Meru Mountain, and in a district known as Nguruman.

The caravan had to halt a few days in Arusha, in order to arrange some articles for exchange with the Masai. The goods which are necessary for a journey into the country of the Masai are as follows:—First and foremost, iron wire; then brass and copper wire of varying thicknesses; next beads, and more particularly little white ones, but in addition some red and dark blue; then cowrie shells and cotton stuff; the latter, however, are not used for the purposes of clothing but are employed by the young men to adorn themselves in war; finally, files, small bells, hatchets, and particularly certain small iron chains, which do not come from Europe but are made in the province of Chaga, at the foot of Kilimanjaro.

The journey was then continued from Arusha to Komboko, which lies in the extreme west of Chaga, and is the last point where corn can be obtained. Here the traveller had a passing glimpse of the peak of the lofty mountain Kilimanjaro, which was covered with thick snow. The word, it seems, does not mean either "mountain" or "greatness," but signifies

Njaro Mountain, by which, among the inhabitants of the coast, an evil spirit is meant. In the territory of the Masai it is known only by the name of "Oldoinjo Ebor," i. e. "white mountain;" while Kenia, the other snow-capped mountain, of which the traveller did not get a view, is named "Doenyo Ngeri" or "spotted mountain." The inhabitants of Ohaga call it more simply "Mangi," with which name they invest their chief also.

After each porter had received a supply of corn for eight days—he is not able to carry more, for he has besides a heavy load of eighty to ninety pounds weight, consisting of iron wire or beads, arms, powder, lead, water-bottle, and cooking-pot—the march into the Masai country proper was commenced. The caravan proceeded but slowly and it was necessary to keep together, because the Masai stab or strike down any straggling carriers. As soon as the place of encampment was reached a stockade was at once constructed, consisting of acacias and mimosas, which are armed with thorns, in order to be in some degree a security against night attacks.

In the district known as "Ngare na erobi" (i. e. "cold water") numerous Masai encampments were met with, and as a result the camp of the caravan was so crammed with persons that it was impossible to move, and the tent was in danger of being pulled down. The white man was regarded first of all with awe, and some warriors who were afraid to touch him with their hands, took their clubs and felt him on the head and hair. The din and hubbub were terrific, especially when a thievish Masai ran off with some article; nothing was safe, even the thermometers hanging before the tent proved too much for their thievish propensities, and they stole them for earrings. The tribute demanded here was, as everywhere in the Masai country, immense. The next encampment was in the Ngare Nyaki territory, which is situated north-west of Kilimanjaro, and a yellowish-red insipid water which brought on giddiness and drowsiness, was found there. It was here that a bloody combat took place with the natives, which was occasioned by some young Masai warriors who, while out seeking wood, attacked the porters of the caravan. The latter, however, were able to make use of their weapons in time, and shot down two of their assailants. Thereupon, in consequence of their cries for help, a general tumult was caused in the camp, such as is common with Mahommedans, and a woman then in the camp was wounded, while an older Masai, who was standing within the intrenchment, was accidentally killed. The Masai themselves, in the course of later negotiations, were reasonable enough to acknowledge these deaths as unintentional.

After this event, the caravan remained for a day and a half in uncertainty as to the course the Masai would adopt. At last, about sunset, a deputation arrived, and stated that they desired peace, and were prepared to accept the customary propitiation. Two loads of iron wire and

some beads were lost in this way, but the parties separated in peace. Extensive plains, in which isolated mountains rose rugged and forbidding, partly connected by chains of hills, were then traversed. Further on a hilly country which rises to a height of 4922 feet (1500 metres) had to be climbed, in order to reach, by bearing to the north-west through successive arid and scantily-wooded plains, a tract of country known as Nguruman. Here dwell the Wa-kuavi, who cultivate negro-corn (sorghum), called *nguruma* by the Masai, and on account of this corn a stoppage was made here for a few days. Among these peaceable people it was once again possible to move more freely. The Wa-kuavi settled here, like those in Arusha, preserve certain fixed relations of dependence on the Masai.

As the corn was not yet ripe in this district, some thirty porters were despatched to the opposite slopes of the mountain range, on the east side of which the district of Nguruman is situated, and which stretches from north-east to south-west through a great part of the Masai country. On the western side dwell an agricultural people, who are descended from the Wa-seguyu tribe settled on the coast near Tanga, and are said to have been driven many years ago into this Masai country in consequence of a famine.

The Masai people are divided into two classes, viz. soldiers and non-soldiers. Only the latter are allowed to marry. After the young men on entry into manhood have been circumcised, they belong to the soldier class, and indeed continue to do so until they have captured enough cattle to be able to form a household. The warrior goes unclothed, except a small goat-skin which hangs down from his left shoulder; older men have a similar but larger skin; while the women are covered by a long mantle made of soft tanned ox-hide, which leaves the breast free. While the women and married men shave the head, the most diverse and ingenious modes of arranging the hair exist among the warriors: now small curls placed in a circle round the head, now little horns standing up in front, and again a pigtail falling over the back. The warrior carries, as weapons, the long spear, besides a short sword and a club carved from the horn of the rhinoceros. Earrings and ornaments of various kinds adorn him, and he decks himself for the fight in a particular way, distinguished by an ornament of an ostrich feather, which has the appearance of a garland. Articles of attire made from the skin of the black-and-white monkey of Central Africa (*Colobus guereza*), and worn on the head or legs, are great favourites, and in districts where this monkey is not found, from 60 to 80 dollars' worth of ivory may be obtained for such a skin. The older men are armed with a smaller spear, and generally with a bow and arrows also.

The chief ornament of the women consists in iron wire, which they wind round the upper and lower parts of the arm and the lower part of the thigh in a spiral form, so that they can only move about in a clumsy

fashion: notwithstanding this, however, they are at work all day, and are often compelled to traverse long distances to fetch water. Besides this, pearl ornaments of various kinds are worn round the neck. The food of the Masai consists exclusively of meat and milk; for the warriors cow's milk, while goat's milk is drunk by the women. It is considered a great offence to partake of milk (which is never allowed to be boiled) and meat at the same time, so that for ten days the Masai lives exclusively on milk, and then ten days solely on meat. To such an extent is this aversion to bringing these two things into contact entertained, that before a change is made from the one kind of food to the other, a Masai takes an emetic. In times when milk is scarce it appears that the warriors open a vein in the neck of an ox, and then immediately suck out the blood: when the animal begins to show signs of weakness, the vein is stopped again.

The Masai regards the burying of his dead as a profanation of the earth, and so he simply lays them under a tree to fall a prey to the birds and hyenas. Among the former it is more especially the marabout stork which devours the corpses.

The country of Nguruman is watered by a stream which rises in the Sambu Mountains and contains water throughout the whole year; from it the natives have made canals for watering their fields. Further north other streams purl down from the above-mentioned range, which all empty themselves into the small river Waso Nyiro ("grey river"), which in its turn coming from the forests on the east of Victoria Nyanza, discharges its waters a little to the south of Nguruman into the Soda Lake. (This lake will be referred to further on.) From Nguruman, which is situated about 2100 feet (640 metres) above the level of the sea, the land rises very considerably. In a few days an elevation of 5086 feet (1550 metres) was reached in the Mosiro district, and from there in several marches the caravan arrived at Lake Naivasha, which is about 6500 feet (2000 metres) above the sea-level. This lake is about half as large again as Lake Zurich, and has no outlet. It is fed by two small rivers which rise in the mountains situated to the north of the lake; its waters are pleasant to the taste, and abound in hippopotami, but no crocodiles. Magnificent pasture-lands with very few trees surround the lake. Between the wooded mountains of Kikuju and the extensive forests of tall trees which are situated near Nyanza, very little rain falls, and the climate in the rainy season is temperate.

On the north of the lake an encampment was made, from which the ivory traders despatched smaller parties to the Wanderobo, who dwell a day's journey further to the north-west, and are of a similar descent to the Masai. They occupy more or less the position of slaves, and devote themselves exclusively to the chase, especially to elephant-hunting. They live scattered among the Masai, more particularly in

districts abounding in elephants. Besides these Wanderobo, a great number of young Masai warriors were found in this region and on the way to the Lake of M-baringo. These men, not content with extorting for themselves an enormous tribute, ill-treated the porters of Dr. Fischer's expedition in such a manner—among other things they branded them on the forehead with red-hot spears—that they refused to proceed further. Moreover, the goods were now so diminished, thirty loads of iron wire having up to that time been disposed of, chiefly in paying tribute, that nothing more would have remained if these bands had had to be appeased. A party of some thirty men were despatched to the borders of Kikuyu, a day's journey distant, in order to purchase corn from the Wanderobo who dwell there and have repeated commercial transactions with the inhabitants of Kikuyu, and on their rejoining the caravan, the expedition commenced the return journey, along the eastern shores of the lake.

The route soon led through a mass of mountains, through which ran a deep ravine. Here on one of the mountain sides a hot spring was found, the basin of which was 30 inches in diameter. In this a reddish-brown water was bubbling, which caused a column of steam to rise and this was visible at some distance. The more or less warm soil in the vicinity of the spring was partly loosened and allowed warm water to trickle through in different spots. In other parts of the ravine also smaller columns of vapour were to be seen in different places on the mountain slopes. Soon after leaving this interesting district, the route led in the direction of Nguruman; from the latter country, however, a different course from that taken on the outward journey was followed. The caravan proceeded in a south-westerly direction to the volcano Doenyo Ngai ("God's Mountain"). The first interesting district reached was the Soda Swamp, which, commencing at a distance of a day's journey from Nguruman, stretches along the mountain range to the volcano for a distance of about 50 English miles. The shallow water of the swamp, which was inhabited by numerous flamingoes and pelicans, showed in different places a temperature of 55° Centigrade, and flows from the foot of the mountain range in a great number of small springs which contain soda and are more or less warm. In the vicinity of the volcano, where the country again rises above 300 feet, the ground was extraordinarily dry, almost treeless, and the grass very parched. The mountain range is here sloping and much rent; huge blocks of stone lie on the plains, which have probably been hurled down there by volcanic agency. The traveller himself saw some smoke issuing from the volcano; he heard from a Mahomedan that in December 1880, when the latter was encamped with a caravan on the south-west of the volcano, a violent earthquake took place accompanied by a discharge of burning masses from the crater of the volcano. In Zanzibar also a slight shock was observed during this very month.

Still continuing in a south-westerly direction, the caravan arrived at the plain of Ngaruka, to which the ground slopes abruptly and which is shut in by mountains. This is a very hot district and dangerous hurricanes often arise there, especially during the dry season. Adjoining the hilly country, which lies to the south, and through which the caravan marched at a height of 4900 feet (1500 metres) while the plain of Ngaruka is only 2400 feet (730 metres) above the sea-level, is the cold highland of Nauja, on which lies the Masai district of Kisongo, where the chief magician of the tribe generally resides. The so-called magicians (*leibou*) possess some influence. Their duty is to ward off dangers from the land, to cause rain, and to fix upon a favourable time for plundering expeditions. Before the young men go out to war, they go to the chief magician for his blessing, and he for his trouble comes in for a share of the cattle captured. The stay of the caravan at Kisongo was only brief, since the Mbatian—as the chief magician is called—was not in residence there, and because the Masai, who, in consequence of the fact that a man in the caravan who had wounded himself by some powder in the hand and face, was obliged to be carried, believed that he was suffering from the small-pox, with which they were acquainted through the Mahomedans, gave the foreigners to understand that they must leave the country as soon as possible. A longer stay of ten days was accordingly made near Mount Meru, not far distant, on the southern slopes of which Wa-kuavi dwell.

One day some thin streaks of snow were visible on the mountain, but they vanished immediately the sun shone out. The Wa-kuavi settled here were formerly dependent on the Masai, like the rest of their scattered tribe, but of late years they have strengthened themselves to such a degree that no Masai dare touch their territory. That they have been able to do this is chiefly due to the fact that they use fire-arms partly, which they obtain from caravans in exchange for slaves. These are mostly captured in the course of the plundering expeditions which are undertaken against the inhabitants of the Paré Mountains.

During the sojourn of the caravan at Mount Meru, the intercourse with the natives assumed such a friendly form, that the Wa-kuavi expressed the desire that Europeans might be left behind to live among them. Dr. Fischer at the close of his report touched briefly on the question how these countries, now become known to Europeans, are situated as regards possible future colonisation. He believes that these territories, situated south of Kilimanjaro and between this and Mount Meru, viz. Chaga Land and the two Arushas, are well adapted for European settlement. In this climate, which is not too hot, these districts are watered by a network of small streams always containing water, and he is of opinion that an important trade could be developed with the Masai. Timber-trees grow on the slopes of the mountains in abundance, and have already been partly used by the natives for

various purposes. The country is also suitable for cattle-breeding, since the tsetse fly is not met with here. The transport of goods to the coast, which is accomplished in ten days, can be done almost entirely on asses, and Masai asses are stronger and more capable of fatigue than those from Unyamwesi. Dr. Fischer's caravan had forty of them, and they acquitted themselves well with loads of from 150 to 180 lbs.

In conclusion, Dr. Fischer exhibited some photographs, chiefly landscapes, and also the twenty new species of birds which he had obtained in the Masai country. The greater part of his collections were expected to arrive about the end of the month by sailing ship. All the collections, among which the ethnographical is said to be especially copious, were to be publicly exhibited in Hamburg in January 1884, and were intended afterwards to be placed in the museums of the city.

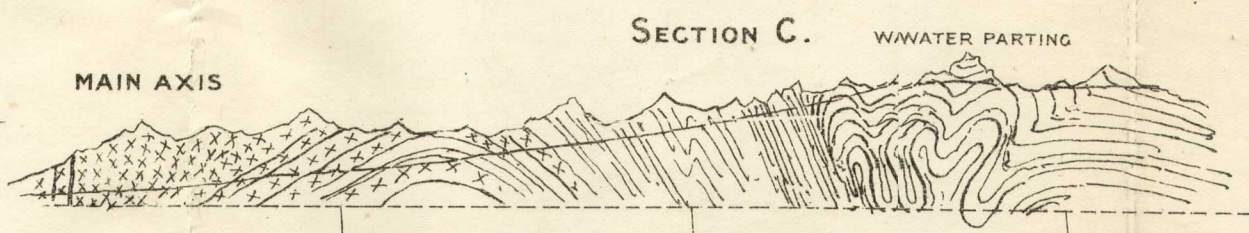
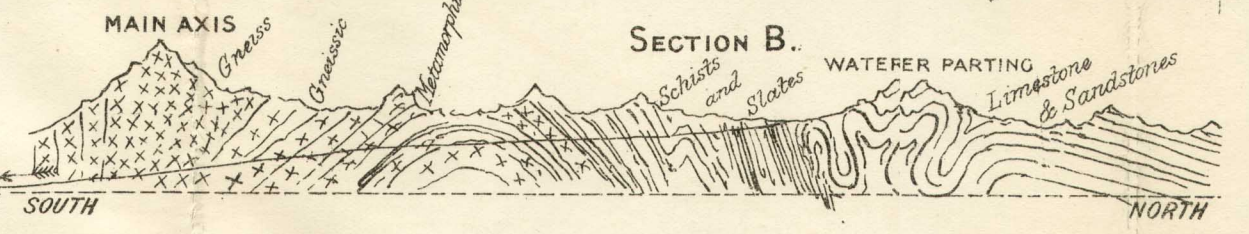
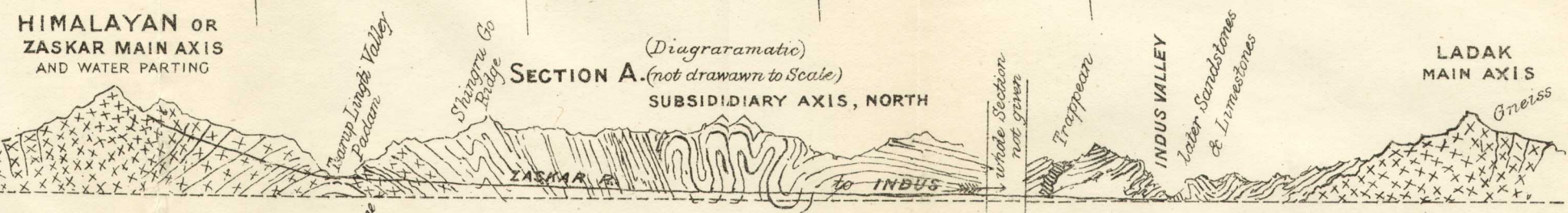
The Mountain Systems of the Himalaya and neighbouring Ranges of India.

By Lieut.-Col. H. H. GODWIN-AUSTEN, F.R.S., &c.

Map and Sections, p. 112.

THE map and sections now submitted were prepared with a view of illustrating a portion of my address to the Geographical Section of the British Association, at Southport, last autumn. The address has been already published in the 'Proceedings';* but, without a map on a scale sufficiently large and with the mountain features accurately defined, it was hardly possible to give a clear idea of the different lines of elevation. This map has been reduced by photography from one compiled in the Surveyor-General's Office, Calcutta, which gives the topographical detail of all the known areas with great clearness. The sections have been reduced from the original on the scale of four miles to the inch, compiled from the North-west Himalaya and Kashmir Survey maps and memoirs of the Geological Survey of India, and my own journals. These will, I trust, enable the reader to follow the different ranges throughout their whole extent, and compare the relationship they hold to each other. Wherever the country is unknown, such as in that great breadth of Nipal territory between Gurhwal and Sikkim, the lines being conjectural are dotted. The only clue to the continuity of the axis line 4 N, far to the eastward, viz. the Baralasa to the Niti Pass line of subsidiary elevation, is derived from the following facts: 1. The persistence of similar physical features in the north-west Himalaya succeeding each other and being continuous respectively for so many miles on the strike of the main mass. 2. Sir Joseph Hooker's observations north of Sikkim, after he had crossed the extensive granite and gneiss of the main range

* Proceedings R. G. S., 1883, p. 610.

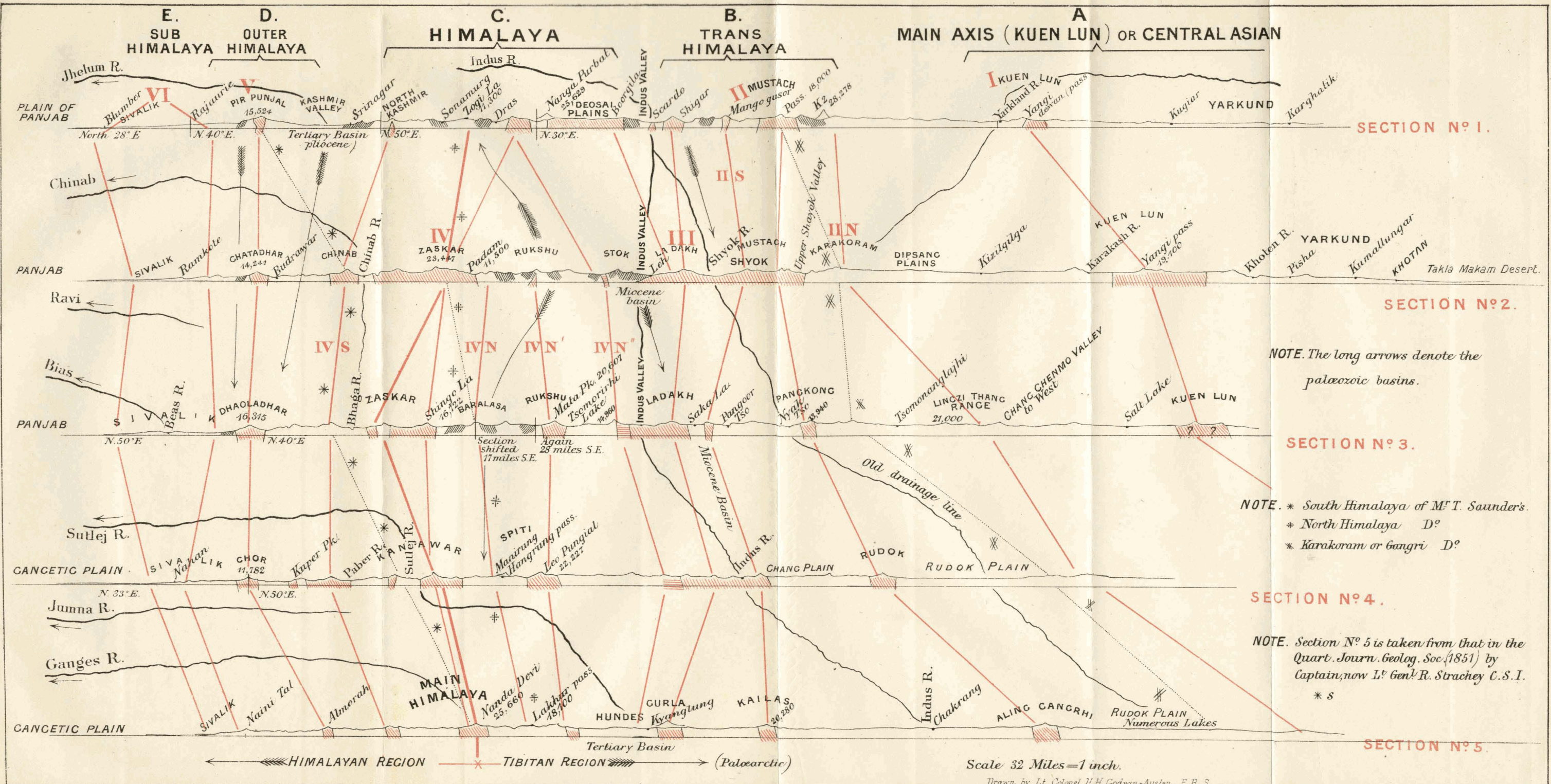


**THE MOUNTAIN SYSTEM
OF THE
HIMALAYA
and neighbouring Ranges of
INDIA.**

An attempt to make the Orography more accordant with the Geological structure, and thus lead to the introduction and use of a common nomenclature in Geography and Geology. To illustrate the address to the Geographical Section of the British Association at Southampton, 1883, by Lt.-Col. H. H. GODWIN-AUSTEN, F.R.S., F.R.G.S.
Reduced from the Railway Map of India, 1st January, 1882, published under the direction of Lt.-Col. J. T. WALKER, C.B., R.E., F.R.S., Surveyor General of India.

Scale 1 inch = 64 Miles or 1:409,600





NOTE. The long arrows denote the palaeozoic basins.

NOTE. * South Himalaya of M^r T. Saunder's.
 * North Himalaya D?
 * Karakoram or Gangri D?

NOTE. Section No 5 is taken from that in the Quart. Journ. Geolog. Soc. (1851) by Captain, now Lt Gen^l R. Strachey C.S.I.
 * S

FIVE SECTIONS ACROSS THE HIMALAYA.

he came, he says, on rocks of quite a different and newer aspect, nummulites even are mentioned; therefore he, apparently, had got upon the southern edge of deposits similar to those found in Ladak. If this should prove to be the case, i. e. like the section at the Baralasa Pass in Rupshu, then neither the water-parting at the head of the Sikkim Valley, nor that of similar valleys on the west in Nipal, could be accepted as a distinct main axis, or range, and separable, as such, from the line of high peaks, Kinchinjunga, &c.

Again, considering the sections of this great range from a broad point of view, there is also the fact of the old palæozoic basins conforming, on the whole, to these lines of elevation. Take that of Skardo for instance. There we find the carboniferous crushed up against the gneiss of the great Deosai Plateau at the Burji La, and repeated on the other side of the valley near Shigar, continuous respectively to the north-west in the Turmik Valley and the Nushik La at the head of the Kéro glacier, the pass leading into Hunza-Nagar, where I last observed these limestones. On the south-east the same formation is continuous over the Tusserpo and Thullé passes, to the junction of the Húshe river with the Saltoro, beyond which I was unable to trace it, as it was on the margin of the season's survey allotted to me by Captain Montgomerie. Yet further, this extensive basin, of 100 miles on its longest axis, probably extending far to the north-west through Yasin, I take to be represented by the limestones of the Pangkong Lake at its north-western end and the stratified series of the south shore on the east and west direction of that lake before reaching Ote. The carboniferous and superincumbent series of Pal at the other and eastern end, Tso Nyak, lying as it does on the north of the Marsémik gneissose axis which strikes the lake at Silung, belong to, and are connected with, the similar formations of the Changchenmo Valley, and these last, on the far north-west, correspond to the limestones and sandstones to the north-east of the Nobundi Sobundi glacier, near the Mustakh Pass.

Pages might be written on the connection of the Zaskar basin with that of Gurès, but it would be entering too much into details, far better handled in 'The Geology of Chumba and Kashmir Territory,' by Mr. R. Lydekker, a record of many arduous field seasons, most ably done, and of vast interest to all geologists and to those who know the country.

It is, while engaged on the consideration of these mountains, that we can form some idea, though it be a very misty one, of the distribution of the land in palæozoic and mesozoic times. Thus the Deosai and the Ladak ranges, and the Zaskar would appear to have been raised at a very early period, and around them the carboniferous was deposited. Conglomerates in these early formations point to not far distant land. The existing parallelism of the ranges had not yet been defined, and these deposits, now so contorted and elevated, covered a far wider field horizontally, as did also the land they skirted. Later, in early tertiary

times, the present parallelism of the ranges had been developed; and south of the Ladak gneiss, a nummulitic sea ran, as a gulf, up the Indus valley, with probably the more open ocean to the eastward. The areas or basins, now filled with these sedimentary rocks, I have roughly defined in the sections by long arrows between their bounding ranges of gneiss and altered slates, in order to elucidate the cause and effect of the gradual development of this great elevated surface.

The main ranges are shown in broader lines of colour than those which are subsidiary; thus I have indicated by a broad line in the Ladak country the gneiss of the lofty range south of Padam (4. The Zaskar); here the main water-parting, and in my opinion an old axis line, and the main one of the Himalaya (*vide* Section A). The older slates, carboniferous and triassic limestones of the mountains to the north are, clearly, crushed up against it, producing the line of mountains (IV. N) which, further east, become often the line of the water-parting between the rivers that flow direct to the plains and the tributaries of the Indus, owing to the greater denudation of the gneissic rocks (Sections B and C). But it must not be accepted that because this has now become the main water-parting, therefore it is the main axis line, in the sense of a mountain chain; it is a part of it, the result of it, and must not be separated, even supposing that the highest isolated peaks of the range were situated on it. It is impossible to expect an exposure of a primitive rock such as granite or gneiss to be always homogeneous, or to possess the same degree of hardness along its strike, for miles, and this is only one element in the argument, for original extent of elevation is another. In nature we find the truth of this; the bosses or tors of Dartmoor are good examples in this country, and so are the high isolated masses like the Kollong rock in the Khasi Hills.

Thus, along the line (No. IV.) or the Himalayan axis, we frequently find the harder masses, of course on a gigantic scale, represented by the spurs connected with IV. N; these forming north and south lines of water-parting between great lateral valleys, with points on these spurs higher than anything else around them. So it follows that on one and the same line of elevation, we may have, and do find, sections like A, B, C, where Section B represents, diagrammatically, say at the Baralasa Pass, what I describe above. It is a very frequent feature, and one which has led to much discussion, as to which is the main range of the Himalaya. In Section C we suppose the primitive rocks to be softer than the stratified; so that, in the lapse of time since original elevation, the former have given way before the latter and the water-parting is on the subsidiary range. It is easy to understand that the elevation of this portion (IV. N) of the Himalaya is the result of the crushing forces between the two great main axis lines, No. III. and IV., adjacent to and between which the stratified rocks were originally deposited, and therefore it cannot be considered of so much importance, from a physical point of

view, as the two last-mentioned elevations. In the Padam, Section A, the stratified rocks are the most denuded, and the Himalayan water-parting is found on the axis of the deeper seated and metamorphic rocks.

In the Ladak range further north, No. III. (indicated in Section A), we have another example of an original line of elevation; for on the south are the early tertiary formations resting against it, forming a long narrow basin of these rocks, the southern boundary of which is not so clearly defined, being lost in the extreme crushing the beds have undergone, as is well seen on the road from the Indus to the Tsomorirhi Lake, producing, parallel to that river, the subsidiary line of elevation 4 N". These examples are sufficient, I trust, to show the weight I attach respectively to the broad and narrow red lines upon the map; the sub-Himalayan elevation being typical of that of the whole mass. By way of further illustration let us suppose that we are dealing with an elevation of stratified rocks alone, in the south-east of England (a much less disturbed or contorted area than the Himalayas), then, the centre of the Weald would represent a main axis lying on the strike of the oldest formations, whilst the run of the North and South Downs would represent the subsidiary axis lines, which although so much higher, and so much more conspicuous, are in fact lying on spurs connecting them with the central water-parting: this is the true orographical view of the area.

It is not, however, so easy to reconcile the many ideas on orography with geological reasoning, or to keep, at the same time, the features of the one subservient to the boundaries and foundations of the other; and this must be some excuse for entering into details so familiar to many. I desire only that this outline of main features should be useful; it is based mainly on physical structure noted in the field, not on a mere reference to the features as displayed on some maps, where, as is frequently the case, faulty compilation gives undue relief and importance to some ranges over others, an importance which, when compared with nature, they do not possess, thus engendering false conceptions of the whole. I leave it to future travellers and those who know the country to work out this subject yet further and with greater exactness, and after a closer examination of the country than I was ever able to give to it; and I leave it especially to those who may have the good fortune to visit the middle and eastern portions of the Himalayas and that great *terra incognita* beyond.

I have also indicated on the map by a fine dotted line the south and north Himalayan ranges of Mr. Trelawny Saunders and his Karakoram Gangri, which, on the whole, correspond respectively with the southern, central, and northern main ranges of Mr. Clements Markham. Starting from the west, the southern is shown as commencing near Dir in Chitral, and at Mozufferabad as joining the Kajrag, and thence following the Pir Panjal south of Kashmir, so far commencing from Mozufferabad: this is a portion of my "outer Himalaya." The direction of the

Zuzufzai Hills is, I think, much nearer its western extension. At the eastern end of the Pir Panjal, Mr. Saunders takes his range some distance back to the mountains skirting the Chandrabagha or Chinab, thus ignoring the true extension and high gneissic ridge of Chatadhar and Dhaoladhar which separates the mountain country of Kishtwar, Budrawar, and Chumba from the sub-Himalaya and the plains. His range is thence continued, easterly, on or close to my main Himalayan range. His northern range lies, also, in places, on this latter; commencing at the Nanga Purbet to the northern water-parting of Kashmir, it follows this exactly up to the high range south of Padam, the true Himalayan axis. East of Padam, again, the winding water-parting defines this range to the Manasarawar Lake, and further to the eastward it is carried parallel to the Sangpo, much further to the north. Mr. Saunders' Karakoram range eastward of the Mustakh conforms to the water-parting north of the Indus up to Rudok, where it is made to cross on to the Aling Gangrhi or my trans-Indus extension; it is then carried south to unite with the high range north of the Manasarawar Lake, and is there continued east as a range north of, and parallel with the Sangpo. It is unnecessary to define it further, for the topography does not exist from which we can lay down such lines; the same may be said of the Kuen Lun extension east of long. 80°.

GEOGRAPHICAL NOTES.

Morrison's Expedition into the Interior of New Guinea.—An exploring party, equipped by the *Melbourne Age*, under the command of Mr. George Ernest Morrison, started from Port Moresby soon after the return of the *Melbourne Argus Expedition** last autumn. Its object appears to have been similar, namely, to cross the island to the north-eastern coast, and it seems to have followed the same or nearly the same route as far as the foot of the Central Range, and to have been compelled, like its predecessor, to bend thence to the eastward in search of a place low enough to cross. Horses were taken, and plenty of pasture found up to the main watershed. At the foot of the range, however, when on the point of success, Morrison was attacked and severely wounded by the natives, who for many days had become increasingly menacing, and the party had to make a hurried return towards Port Moresby. In his telegram to the *Age* from Cooktown, Queensland, sent immediately on his arrival, November 20th, Morrison says he had reached a point more than 100 miles distant from Port Moresby, and was attacked whilst crossing a spur of the main range. His party was a very small one—two white men besides himself, only one of whom, Lyons, could be relied on, and apparently only two native porters.

* Proceedings R. G. S., January number, *ante*, p. 37.

New Expedition to Mount Kilimanjaro.—Mr. H. H. Johnston has accepted the mission to explore Mount Kilimanjaro, promoted by the Council of the British Association, and towards the expenses of which they renewed last year their grant of 500*l.* The main object of the expedition is to obtain as complete a knowledge as possible of the fauna and flora of the mountain, the few specimens obtained in zoology by the Von der Decken Expedition, and in botany by Mr. Charles New, having shown that its productions are of the highest scientific interest in relation to unsolved problems of geographical distribution. The Royal Society have contributed a grant of equal amount to that of the British Association. Mr. Johnston will leave for East Africa in March.

The Congo.—Mr. E. Delmar Morgan, who was associated with Sir Frederic Goldsmid on his recent mission to the Congo, returned to England on the 22nd of January. He remained on the river after Sir Frederic left, and made a journey to Stanley Pool.

The German East African Expedition.—The German African Society have received news from their East African Expedition, in letters from Dr. Böhm, at Karema, on May 18, 1883, and M. P. Reichard, at Mpala, on July 12, 1883. The intended trip to Lake Moero (*vide* 'Proceedings,' 1883, p. 551) could not be put in execution, because Dr. Böhm had been severely wounded in a fight against the aborigines of Katakwa (25 miles north-east of Karema), on the 24th of March last. The expedition against this village was undertaken by Lieutenant Storms, now in command of the Belgian station at Karema, in order to punish the inhabitants, who had been plundering and murdering the couriers sent by him to the coast. Dr. Böhm was restored to health in the middle of June. In the meanwhile Mr. Reichard at first assisted Lieutenant Storms in selecting a suitable locality for a new Belgian station on the western shore of Lake Tanganyika. This station was founded early in May at Mpala's village, at the mouth of the river Lufuku. Afterwards M. Reichard returned for some weeks to Karema: he then brought his caravan over to Kapapa (Kapampa of Thomson), and starting from there on the 5th of June, he made an interesting tour through the hitherto unexplored mountains of Marungu, reaching the new station of Mpala on the 21st of June. The details of this route, which he surveyed by compass and aneroid, will be transmitted to Berlin by the next courier. Dr. Böhm crossed the lake from Karema after his entire restoration to health, and joined his companion at Mpala on the 9th of July.

Scientific Results of the Pogge-Wissmann Expedition.—The astronomical positions determined by Lieutenant Wissmann having been calculated and determined at the Royal Berlin Observatory, the first three sheets of the route map of this important expedition, compiled by Dr. R. Kiepert, will be published in the next number of the 'Mittheil-

ungen der Afrikanischen Gesellschaft,' probably in February next. In the same number Wissmann's barometric altitudes will appear, having been calculated by Professor Zöppritz of Königsberg.—Though Wissmann was limited to aneroid observations (his Fortin barometer was broken at Malange before the real exploration commenced), his altitudes will be of great value, because his aneroid, when compared with the barometer of the meteorological station at Loanda, and with that of Mr. Griffith at Plymouth Rock, Lake Tanganyika, proved to be constant.—The journals of Lieutenant Wissmann, who, as we announced in the November number,* has been engaged to conduct a new expedition in the basin of the Congo, will not be published until Dr. Pogge returns, who is the leader of the expedition, and who is awaited with impatience; the last news that reached Berlin was from Mukenge, September 27, 1882, which announced his intended departure for the coast in May 1883.

Letter from King Mtesa.—Sir John Kirk has sent to Colonel J. A. Grant a letter, in original, which he received in September last from King Mtesa. The following translation of the unique document—from the Arabic—kindly made by Dr. Rieu, of the British Museum, we here present to our readers, to whom it will be interesting as a communication from a monarch whose name is so intimately associated with all the great geographical explorations of our time in Equatorial Africa:—“In the name of God, the Merciful, the Compassionate. To His Excellency the most noble, respected, honoured, and illustrious friend, dearest to us, Kirkir (Sir John Kirk), the English Consul, may God the Most High keep him in safety. Peace on you, and God's mercy and His favours and the purest and noblest of His blessings. These lines are sent to you from the port of Afric to the port of Zanzibar. News from this place are good, and the agitations at rest. There is no more intelligence that we may convey to you, but [our wishes for] your welfare, the rejoicing of your heart, and the lasting of your life. Further we inform your noble person that the pen of Divine decrees has passed upon us. Our mother Al-Namsuri has departed from us. We said as the patient say: We are of God, and to God we return. This is the way of this world and the path to the next. We liked to let your Excellency know, so that you may be informed. Our request to you is that you may not deprive your friend of information touching your noble state, and also any wish of which you may give a hint. Convey our greetings to all persons present in your noble place, and Salám. Dated the first of Rajab 1299 (19 May 1882).—Written by his order by Mas'ood Resalmin Ben Sueilim with his own hand.”—(King Mtesa's seal, partly obliterated, appears to contain the words Sultan of Wuganda, with the date 12.8, the third figure illegible.) The above is a literal translation of the Arabic original.—CH. RISS, British Museum, 8 Jan. 1884.

* 'Proceedings,' 1883, p. 650.

Mr. Juan Maria Schuver.—It is to be feared that this gentleman, one of the most energetic of our younger African travellers, has been a victim of the recent commotions in the Egyptian Soudan. He is reported to have been killed by the Dinkas whilst on his way in July last, by land, from Khartum to Lupton Bey's station on the Bahr Ghazal. Mr. Schuver was a pupil for some time of our Mr. Coles before starting on his last expedition, and showed great aptitude in the arts of surveying and mapping, so that valuable results were expected from the journey which he intended to make through Central Africa from north to south. In 1882 he penetrated into the Galla country, south-west of Abyssinia, reaching the Jaboos river, and sent home two maps of the country, which were published in Perthes' 'Geographische Mittheilungen.' But this was only intended as a preliminary excursion. He descended to Khartum for a fresh start, some months prior to the fatal journey towards the Ghazal. Mr. Schuver's father was Dutch, his mother a Spanish lady. Previous to his African undertaking he had served with the royal arms during the Carlist insurrection, and was decorated for service in the field. He afterwards fought on the Turkish side during the Russo-Turkish war, and was taken prisoner whilst attempting to carry despatches out of Plevna, contriving subsequently to escape. After this he lived for some time among the Kurds in the vicinity of Lake Van, coming to England in 1880, and proceeding to Egypt in 1881.

Lieutenant Greely.—A vigorous effort is about to be made to relieve the party of officers and men of the United States Signal Service, under Lieutenant Greely, who are now passing their third winter at Lady Franklin Bay, in Smith Sound. A plan of operations has been decided upon by a Government commission in Washington, and relief parties will be despatched early in the ensuing season. The following correspondence on this subject has passed between our Council and General Hazen:—

"1, Savile Row, W., December 20th, 1883. Dear Sir,—I am requested by my colleagues of the Council of the Royal Geographical Society to express to you our great anxiety at the continued absence of news of Lieutenant Greely and his party, so long secluded at Lady Franklin Bay, and at the failure of the attempt last summer to afford them relief. The Council believe that it may be possible for those in this country who sympathise with the gallant band and their work, to further any measures for their relief that may be thought necessary or practicable, and would therefore be glad to receive information on the best authority, namely, that of the chief of the branch of service to which most of the members of Lieutenant Greely's expedition belong, with regard to the steps it is intended to take in the United States with this object. I am accordingly commissioned by my colleagues to ask you to be so good as to favour us with such information as you may be able to furnish.—I am, &c., ABERDARE, President R.G.S."

“ War Department, Office of the Chief Signal Officer, Washington City, Jan. 5th, 1884. The Right Hon. Lord Aberdare, F.R.S., &c., Pres. Royal Geographical Society. My Lord,—I am in receipt of your letter of Dec. 20th, 1883, asking, in behalf of the Council of the Royal Geographical Society, information regarding the steps now in progress for the relief of Lieutenant Greely’s party, and in reply beg leave to say that the President has referred the whole subject to a joint board composed of officers of the Army and Navy, whose report has not yet been made public. I can say, however, that the Government of the United States will, at such time as to take advantage of the first opening of the season, put on foot a thoroughly equipped expedition that will proceed to Smith Sound, prepared to make such efficient efforts for the relief of the party as to leave little doubt of its complete success. I am grateful for the kindly sympathy expressed in the letter under reply, and for the offer which you extend on behalf of the Council to further any measures for Lieutenant Greely’s relief that may be thought necessary or practicable.—Your obedient servant, W. B. HAZEN, Brig. and Bvt. Major-General, Chief Signal Officer U.S.A.”

Expedition through the Shan Country.—Mr. Holt S. Hallett, c.e., returned to Burmah last autumn and planned a journey of exploration through the Shan States to Ssumao. Dr. Cushing, the eminent Shan scholar, who has been engaged at Rangoon in translating the Bible into the Shan language, has consented to accompany him. The official engineer at Maulmein, with the consent of the Chief Engineer of British Burmah, will accompany Mr. Hallett as far as the frontier and afford him what assistance he can. The party will proceed from Maulmein viâ Zimmé, and is expected to be absent about sixteen months.

French Exploration.—The French Government have inscribed on the Budget of next year the sum of 100,000 francs for grants in aid of geographical exploration, under the title of “ Colonial Missions.”

CORRESPONDENCE.

Livingstone’s Lake Lincoln.

22, BURLINGTON ROAD, IPSWICH,
Jan. 1, 1884.

SIR,—Having for some years taken a great interest in African exploration, I venture to address you on a point of much interest connected with it, viz. the identification of the “ Lake Lincoln ” reported by Dr. Livingstone, which has hitherto been looked for in the little known district west of Nyangwe, and north of Cameron’s route.

It has always surprised me that travellers seeking to identify this lake should continue to connect it with vague rumours of lakes in the above-named district, or not finding it here, assert, like Lieut. Wissmann, that it does not exist, although a lake (Kassali of Cameron) has actually been discovered answering to Livingstone’s

accounts in many more points than any other could, even if found in the place expected. The greatest objection to the view of the identity of the two lakes seems to be that Lake Kassali is not drained by the river Lomami, as Lake Lincoln was said by Livingstone to be; but it is noticeable that in his earliest accounts (which are also the most definite) and when he gives the name "Lincoln" to the lake, he makes no mention of this river, and does not appear to have heard its name; while those accounts agree entirely with what is now known of Lake Kassali. In 'Last Journals,' vol. ii. p. 49, we find that he was told by traders of "a lake N.N.W. of the copper-mines, and twelve days distant"; that "it is called Chibungo, and is said to be large. Seven days west of Katalifa flows another Lualaba, the dividing line between Rua and Lunda or Londa; it is very large, and as the Lufira flows into Chibungo, it is probable that the Lualaba West and the Lufira form the lake." These rivers are also given as the influents of the lake when he gives it the name of "Lincoln" ('Last Journals,' vol. ii. p. 65). Now this is exactly the position and these the influents of Lake Kassali; and before the discovery of the latter, Mr. Ravenstein (in the map given with the 'Geographical Magazine' for January 1875) drew Lake Lincoln and its main influent almost exactly as Lake Kassali and its main influent are drawn now.

Later on indeed Livingstone considered the Lomami as the effluent of his lake. He speaks of wishing to go "to Lomamé, then buy a canoe and go up Lake Lincoln to Katanga" (vol. ii. p. 130), and says that "Young's Lualaba flows through Lake Lincoln, otherwise named Chibungo, and Lomamé, and that too into Webb's Lualaba" (vol. ii. p. 170). It is not difficult to see how this mistake (as it probably was) originated. The traders who knew the Lomami west of Nyangwe told him that it "came from a lake" (e. g. vol. ii. p. 187), and he naturally concluded that this was Chibungo. Now it is true that the Lomami where the traders knew it comes from the direction of Lake Kassali, though not from it; according to Cameron's delineation of the river they might have ascended it in the same direction to within sixty miles of the lake, and it was a natural mistake to believe that it did come from it. Besides in the two passages quoted last, Livingstone still speaks of it in connection with the West Lualaba and Katanga, which shows that he had not altered his former views of its position and main influent.

As to name, that of Livingstone, "Chibungo," has never been heard by any other traveller. But it seems that Lake Kassali is called also Kinkonza or Kikonja, from a chief of that name living near it; and it does not seem impossible that this may have become, in the pronunciation of the half-castes who gave the information, "Chibungo."

On the whole, therefore, the arguments appear greatly to preponderate over the differences, and even if more serious objections to this view exist, it would be interesting to hear them stated, as the accounts of travellers do not contain a satisfactory discussion of the subject.

Yours faithfully,

EDWARD HEAWOOD.

The Assistant Secretary R.G.S.

REPORT OF THE EVENING MEETINGS, SESSION 1883-4.

Fourth Meeting, 7th January, 1884.—The Right Hon. LORD ABERDARE,
President, in the Chair.

ELECTIONS.—*Frederic Bonney, Esq.; Captain Henry Philip Dawson, B.A.; Daniel Fowler Howorth, Esq.; Herbert Ingleby, Esq.; William Lonsdale, Esq.; Ivan Arthur Morris, Esq.; Lieutenant James H. F. G. Nixon, B.N.R.; George Petrie, Esq.; Joseph Grafton Ross, Esq.; Harry Sylvester Samuel, Esq.; G. J. Scott, Esq.; George Skelton Streeter, Esq.*

The paper of the evening was as follows:—

“Recent Explorations in the Southern Alps of New Zealand.” By the Rev. W. S. Green. See *ante*, p. 57.

In the course of the discussion which followed the reading of the paper, Mr. Douglas Freshfield read letters from Mr. W. W. Graham, dated from Tumlong in Sikkim, November 11th and 14th, giving an account of his ascents in the Himalaya. Mr. Graham is accompanied by the two Swiss guides, Emil Boss and Ulrich Kaufmann, who had previously made the ascent of Mount Cook with the Rev. W. S. Green (*ante*, p. 68).

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—Second General Meeting of the year, held December 21st, 1883: M. FERDINAND DE LESSEPS, President of the Society, in the Chair.—In opening the meeting the Chairman, before calling upon M. Maunoir to read his annual report, delivered one of his customary short addresses on the Panama and Suez Canals. He stated that the works in connection with the piercing of the Isthmus of Panama were making rapid progress, and that the sanitary condition of the dockyards and works left nothing to be desired (a statement previously made by him at the last meeting). Then, passing on to the Suez Canal question, he said that the shareholders were the sport of speculation. No one had a right to construct a second canal, and that, supposing this right were possessed it would not be possible to cut another canal in any other place than that chosen, as being most favourable for the construction of the original canal. Starting from the Mediterranean it would be impossible to go to the right hand, because there were situated the cultivated lands of Egypt, and by cutting a canal the peculiar system of irrigation, which was the secret of the country's wealth, would be destroyed. Neither could a canal be cut to the left of the present one, because of the sand-hills there. He had submitted a scheme, embodying certain proposals and conditions to the English Government, and was awaiting a reply. If the Government sends no reply, or shuffles the question, “very well,” says M. de Lesseps, “the question shall stand as if no proposals for agreement had been made, and we will accomplish our business alone.” M. de Lesseps was of opinion that it would be sufficient to enlarge the present canal. In a few days the engineers who form the council of the company, would be called together to give their opinions as to the best means of carrying out this.—M. Maunoir, General Secretary, then read his report on the operations of the Society, and the progress of the science of geography during the year 1883. With reference to the Society itself, M. Maunoir stated that the Central Commission was at that moment busily engaged in devising fresh outlets for the activity of a larger number of the members of this Society by creating sections;

thus the individual operations and particular researches of the various members would be centralised. In the second part of his report, which was occupied with a general review of the progress of geography during the Session then about to close, M. Maunoir stated that an attempt was being made in Algiers to carry out a project similar to that tried by England in India. It would be remembered that the English, since the approaches to Tibet and the lofty summits of Central Asia were practically inaccessible to them, had sent into these regions Hindoo schoolmasters, "pundits," whom they had trained for the various operations of surveying. The Geographical Service of the Army were about to make a similar trial with the Arabs and Kabyls, so as to utilise the native aptitude for geography, for the purpose of effecting surveys in the countries bordering on Algiers and Tunis, into which it was difficult for Europeans to penetrate. The regular map of Algiers and the surveys executed in the south of the three provinces of this colony would be studied by future native pioneers, who, trained by the most able military topographers, would prove valuable auxiliaries to travellers. The Continent of Asia, which this year has not been the scene of any important travels, furnished the Secretary with an opportunity to recall the names of a number of English travellers, and to make some interesting extracts from the memoirs inserted in the 'Proceedings.'—In these General Meetings of the Society there is scarcely room for any communications, except the Report of the General Secretary. On the present occasion, however, there was a long and highly interesting paper by M. Alphonse Milne-Edwards, of the Institute, professor at the Jardin des Plantes, who was present to give an account of the results of the scientific campaign, directed by him last summer in the Atlantic Ocean, on board the Government ship *Le Talieman*. This voyage must be considered as a continuation of the three expeditions made by *La Travailleur*, another Government vessel. *Le Talieman* is a screw steamship belonging to the class known as "éclaireurs d'escadre," a very fast vessel, which, having been fitted up with a view to the special operations it was destined to accomplish, possessed considerable advantages over the ship formerly placed at the disposal of the French savants and naturalists. The vessel was supplied with all the apparatus necessary for making researches in the depths of the ocean. Instead of hempen ropes to raise the dredges, the ship was provided with a cable made of steel wire, capable of lifting a weight of nearly 4½ tons (4500 kilogrammes). A splendid service of electric light, supplied by four powerful steam engines, greatly assisted the dredgings and soundings. Thanks to these resources, it was possible to sweep the ocean with great nets at depths of more than 2500 fathoms, and to secure abundant booty. The mission was charged to study the coast of Africa as far as Senegal, to explore the approaches of the Cape Verd Islands, the Canaries and Azores, and lastly, to visit the Sargasso Sea. Operations were commenced on the 1st of June, 1883. In the depths which stretch away to the west of Morocco and Senegal, 120 dredgings were made at depths varying from 500 to 1500 fathoms, which brought to the surface a mass of fish of new species, the quantity of which, said Mr. Milne-Edwards, surpasses the imagination. At times the nets were raised laden with such riches that the whole day and more was occupied in classifying them. Some of the marine animals, fished up from these great depths, presented strange forms, many were blind; often their colours were of surprising variety, considering the fact that light never penetrates to their deep abodes. From the Cape Verd Isles the naturalists, after having stopped a short time at Santiago and St. Vincent, proceeded to visit the little desert island of Branco, the approach to which is of a most difficult nature. On the island they found a peculiar species of lizard about 2 feet in length (60 centimetres). The geological formation of the island, its fauna and flora were made the subjects of special study. Between the Cape Verd

Islands the ocean is of immense depth and animal life abounds there to an astonishing extent. In this neighbourhood, at a depth of 300 fathoms, with a single cast of the net a capture of 1000 fishes and nearly 2000 shrimps of different kinds was made. On the 30th of July the *Talisman* directed her course northwards to the Sargasso Sea. The algæ found there do not form, as might have been supposed, those enormous masses which have been compared to floating prairies, and at which the companions of Christopher Columbus were terrified and almost refused to advance. The weeds float in masses of greater or less extent, and, following the direction of the winds and currents, they serve as receptacles for quite a population, consisting of molluscs, crabs, shrimps, &c., which has formed the surface coating of the Sargasso Sea, and the colours of which harmonise so well with the algæ that it is not possible to observe distinction between them. A singular little fish is met with there, which makes its home by twisting together, by means of viscous filaments, balls of gulfweed, to which it confides its eggs. The bottom of the Sargasso Sea is of a volcanic nature, and there exists there a great submarine volcanic chain running parallel with the African coast, the only points not submerged being the Cape Verd Islands, Madeira, the Canaries, and the Azores. The existence of this range was proved by the pumice and volcanic stones which each dredging brought to the surface. Starting from the Cape Verd Isles the bed of the Sargasso Sea hollows regularly until the 25th parallel is reached, and there it attains a depth of 20,561 feet (6267 metres); it then gradually rises as far as the Azores, and under the 35th parallel the depth is only 10,417 feet (3175 metres). These figures do not agree in any way with those found in recent maps published in Germany. The *Talisman* made a short stay at the Azores, and the scientific mission was able to compare there the phenomena still in activity on several summits, with those which it had studied on the peak of Teneriffe. According to M. Milne-Edwards the analogy between the rocks, gaseous products, and sulphur deposits of the two island groups is very striking. A rich vegetation covers the recent streams of lava, and real craters vomit forth torrents of boiling water into the midst of thick woods and crops of maize. The return to France was accomplished during calm weather, which allowed of dredgings being made in enormous depths, from 2000 to 2500 fathoms. The naturalists discovered there the presence of a number of animals, some of which were of great size and belong to zoological groups of a very high order. At the bottom of the ocean the expedition found not only pumice stones, but also stones polished and striated by glaciers. M. Milne-Edwards supposes that these stones were transported there by the floating ice, which in the quaternary period advanced even into these latitudes, and being melted in this part of the Atlantic, allowed the stones, detached from the bed of glaciers, to fall to the bottom. The *Talisman* returned to Rochfort with immense collections, of which there will be an exhibition in a few days in the halls of the Natural History Museum at Paris.

— January 4th, 1884: M. ANT. D'ABBADIE (of the Institute) in the Chair.— Among the various maps presented to the meeting was one of Antananarivo and its environs (Madagascar). This map, scale 1 : 100,000, has been prepared by Father Roblet, of the Society of Jesus, who has resided in Madagascar for a great number of years. The author has accurately surveyed the smallest villages, even those which do not number more than five or six huts. The map was presented by M. Tournafond, editor of *L'Exploration*, and it will probably be reproduced in this geographical work. M. Ch. Bayle, the publisher of a French Colonial Atlas at present in course of publication, presented to the Society the three first sheets of the same, which are as follows: (1) The Red River and Tong King; (2) The Congo, Ogowé, and Gaboon Rivers; (3) Madagascar. This Atlas of the French Colonies will comprise 25 maps, together with 90 plans of towns, bays, &c. The same publisher is about to publish

"The Victor Turquant Atlas," which has been prepared according to a new method of projection called "en fuseaux." Proofs of this atlas were also presented to the Society.—The General Secretary announced the formation of a Society, having for its title "L'Alliance Française." Its object is the propagation of the French language in the colonies and abroad. One of the honorary Presidents is M. Ferd. de Lesseps, President of the Society. In the Committee of Organisation the name of M. Paul Bert figures by the side of that of Cardinal Lavignerie, Archbishop of Algiers, that is to say, men of all shades of opinion without any party distinctions are represented on the committee. The Association is of opinion that in the colonies and countries under the protectorate of France the best means of winning over the natives, of facilitating social relations and commercial intercourse with them, in short, of extending beyond the seas by means of peaceable annexations the French race, which increases too slowly in Europe, is to make the French language known and loved.—General Faidherbe, late Governor of Senegal, communicated the letter which he had just addressed to his colleagues in the Senate, asking them to include again in the Budget the sums necessary for the continuation of the Upper Senegal Railway; these amounts having recently been refused by the Chamber of Deputies. The General said that the projects which France is undertaking in Upper Senegal had been treated as "insane." But was it insane to seek out fresh markets for the national commerce? Was not France compelled to struggle elsewhere with foreign competition, with such nations as the English, the Germans, the Dutch, and the Americans, each possessing the natural aptitude for commerce? But on the Niger France was alone in possession of an immense field of exploration. She held the only gate, as it were, and had no fear there of difficulties with other nations which often arise in other places.—It was announced that M. Thouar, the young traveller, who started some time ago to discover the remains of the Crevaux Mission, had arrived at Asuncion on the 18th November last, and that it was his intention to set sail for France in a few days. M. Thouar is, it appears, very well satisfied with the results of his journey, which he believes will be the means of opening up a way of communication connecting Bolivia with Paraguay, and affording means for the introduction or exportation of the produce of the two countries, the annual value of which is said to be not less than four millions sterling. According to M. Thouar these countries contain immense riches.—A letter, dated 24th of September, 1883, from Corumba, from M. Milhôme, who has been pursuing the same object as M. Thouar, viz. the discovery of the remains of the Crevaux Expedition, having been communicated already to the papers by the Council of the Society, nothing further was added on the subject except an announcement to the effect that a complete collection of arms, utensils, instruments, and clothing of the Tobas Indians (the murderers of the French Mission) was in course of transmission from M. Milhôme. These articles will undoubtedly form material for an exhibition to the Geographical Society.—Captain Bernard communicated a short account of a long excursion which he had accomplished during the closing months of 1883 in the province of Algeria. He has traversed Kabylia by way of Fort National and the Pass of Tirourda; he then directed his course to Aumale and from there to Bou-Saadat and Laghouat. He next returned on Djelfa, and finally reached Algiers viâ Boghar. The journey was accomplished by daily marches of from 20 to 30 miles, and the total distance traversed was more than 300 leagues. Regarding this journey from a purely geographical point of view, the captain made a survey of his route between Bou-Saadat and Laghouat, and he is now busy preparing a fair copy of this map. In addition to this he has determined the altitudes of the principal points along his route between Bou-Saadat and Laghouat.—A communication was received from M. Mizon, naval lieutenant, who had just returned from the

coasts of Western Africa, upon the journey he had made. He quitted Franceville on August 19th, 1883, after having handed over to M. de Brazza the command of the stations of which he had been in charge. Being perfectly free from that time in his movements, it was his desire to return to Europe by proceeding directly from Franceville to the coast along a route between those of the Ogowé and Kuilu. He hoped by this means to come out into the vicinity of the lagoons of the country of Yumba (Mayumba). His object was to make himself acquainted with the configuration of the country, and to discover the real line which separates the basins of the Ogowé and Nyanga from that of the Kuilu-Niari; also to study the commerce of these countries, to define on the south the limits of the spreading wave of migrations coming from the north, and finally, to try and discover a practicable route, starting from the coast and leading towards the orographical knot whence the Passa and the Alima flow.—M. Desgodins, brother of the Abbé, addressed to the Society the sheets of meteorological observations made by Monseigneur Felix Biet at Ta-tsen-lu (China).—M. Michel Venukoff announced the publication in Russia of the second volume of the important work on Turkomania, by General Grodekoff, Governor of Tashkend, and that two other volumes would appear in 1884. Also that the third volume of the ethnographical researches of M. Potanine in Mongolia had been published; M. Potanine being then *en route* for China. M. Venukoff stated that the explorations in Pamir by MM. Pontiat, Ivanoff, and Bendersky would be the subject of a report then in course of preparation. The correspondent hoped to be able to communicate very shortly to the Society a translation of this interesting report, pending which he presented a manuscript map of the district of Pamir, which was exhibited in the hall. M. Venukoff further announced that the Russian Commission, charged to explore the ancient bed of the Oxus, had just completed its operations. The re-establishment of the stream of water along the whole stretch of the ancient bed from Khiva to the Caspian Sea was possible, but, as it would be necessary to cut a canal 124 miles (200 kilometres) long, and to divert the water from certain lakes, the enterprise might be considered as never likely to be carried out.—An account was then given by M. René Roy of the excursion which he made last summer on the confines of Swedish Lapland. He pointed out that the country is not so desert or uncultivated as might have been supposed, and cannot understand why the Swedes go to find in the United States districts to annex, while they have them at their very doors.—In conclusion, M. Pedro S. Lamas, editor of the *South American Review*, made a communication on the economic situation of the Argentine Republic, and more particularly upon the census of the population made in 1881 in the province of Buenos Ayres. He compared the figures of the present statistics with those of the census of 1876. He concluded by observing that "Latin America" needed without doubt the labour, capital, and experience of Europe, but that on its side Europe might be able to find beyond the seas, by means of emigration and commercial and industrial activity, the solution of some of its social and economic problems.

Khedivial Society of Geography, Cairo.—Nov. 26th, 1883: Dr. F. BONOLA, Secretary, read a communication on Kordofan, founded on the work and publications of the former Egyptian Staff and particularly on the following works: Prout's 'Province of Kordofan' and Colston's 'Northern and Central Kordofan,' and commencing with an historical sketch of the earlier travels and explorations from the time of Ruppel. In conclusion he commented on the map, prepared by Prout in 1876 and published by the Society, drawing attention to the sources of information used by the author, which insured the comparative accuracy of his work.—Vidal Bey, Secretary of the Institute, read a very minute and important paper on the life and works of His Eminence Linant Pasha de Bellefonds, whose works on and in the

interests of Egypt mark an important epoch in the recent history of the country.—Abbate Pasha pronounced a funeral discourse on Gaillardet Bey, a member of the Central Commission, whose works on the geology and botany of Syria met at the time of their issue with a favourable reception.

— December 21st, 1883: In the General Meeting held on this date, a report by **ABBATE PASHA** on the preceding triennial period having been read, Abbate Pasha and Rogers Bey were nominated Vice-Presidents for the ensuing term, and eleven members—Figari (Italian), Blum (Austrian), Zimmermann (French), Baravelli (Italian), Gastenel (French), Moktar (Native), Franz (German), Vidal and Larmée (French), Cheffik Bey and Ismail Bey (Native)—were nominated on the Central Commission.—Ismail Pasha having resigned the Presidency, His Highness the Khedive had appointed in his place H. E. Mahmoud Pasha, known as an astronomer and as the author of the map of Egypt and ‘Studies on Ancient Alexandria.’ Dr. F. Bonola remains Secretary-General.

NEW BOOKS.

(By **E. C. RYE**, *Librarian R.G.S.*)

EUROPE.

Müller-Beeck, F. G.—Eine Reise durch Portugal. Hamburg (L. Friederichsen and Co.): 1883, 8vo., pp. 84, map. (*Dulau*: price 3s.)

A sketch of the physical geography and general features of Portugal observed during the author's tour in 1878, in which he paid special attention to geology and mineral productions. A list of positions and elevations is added from Pery's ‘Geographia e Estatistica Geral de Portugal’; and the coloured geological map is based on Vogel's map in Stieler's atlas and Ribeiro and Delgado's geological map of 1876.

ASIA.

Bell, H. C. P.—The Maldive Islands: an Account of the Physical Features, Climate, History, Inhabitants, Productions, and Trade. Colombo (Frank Luker, Acting Government Printer, Ceylon): 1883, fo., pp. iv. and 133, maps and table.

Mr. Bell, of the Ceylon Civil Service, here attempts, as he says, “to do some justice to a people little known and less regarded”; his memoir has fortunately been ordered to be printed by His Excellency the Governor, and is nominally a sessional paper of 1881, advantage having been taken of an unavoidable delay to bring the subject matter up to date. The Report is (after some brief introductory observations) divided into eight sections, respectively discussing the physical features, climate as affecting health, political division, history, inhabitants, products and manufactures, trade and commerce, and money, weights and measures of the islands, with two appendices on the political status of their Sultan and the treatment of wrecks. The first three and the fifth of these subjects are avowedly written up from trustworthy published accounts; but the fourth and the last two sections are believed to contain a considerable amount of entirely new matter.

The sketch of the physical structure of this group of atolls (more than twenty clusters of which exist, though the number is conventionally reckoned as thirteen) is summarised from the ‘Sailing Directory,’ Horsburgh, Owen, and Moresby, but some interesting explanatory notes by various writers are added. The existence of fresh water, perfectly fit for drinking, in the inhabited parts of this collection of almost submerged madreporic reefs and islands is proved by the quoted analysis of a competent official. The unhealthiness of the climate is attributed to the slight changes of temperature and the malaria induced by the

number of lagoons and marshes, and the ubiquitous jungle-growth which excludes sea-breezes. A curious sun-blindness is noted among the prevalent native complaints.

Málé, or Sultan's Island, at the south entrance of the North Málé Atol, is the capital of the Máldive group. It is oval in shape, low-lying, like the rest, and about one mile long by three-quarters of a mile broad, with no soundings on the south, but a sandy bottom at from 25 to 28 fathoms round its inner side. An unbroken reef, just awash, renders its south side inaccessible; but the rest of its circumference has a lagoon or harbour formed by an artificial bank of coral three or four feet above water, and six to eight feet in width, roughly renewed from time to time, which serves as an effective breakwater against the monsoon storms. As the depth of the water inside is from 6 to 14 feet, this harbour gives excellent shelter to the trading and fishing-boats of the natives. The only entrance, about 30 feet wide, is on the north. An old fort (of which a plan is given) probably erected by the Portuguese in the sixteenth century, can be traced, even a few pieces of unserviceable ordnance, choked with coral, still remaining. The Sultan's palace is a large upper-roomed house in an inclosure of about a quarter of a mile in extent; the town is somewhat regularly laid out with broad streets, intersecting at right angles, and shaded by a variety of fruit trees; it contains two chief and several minor mosques, a minaret, a public office, a mint, and a house set apart for visitors and shipwrecked persons. Only one stone and brick built private house exists. There are from 2000 to 3000 inhabitants, many of whom are traders, though the most common employments are fishing, gathering coco-nuts, and collecting cowries. The whole population of the inhabited islands (which probably exceed 200 in number) is assumed now to be at least 30,000.

The botany and zoology of the islands seem as yet practically unknown, but will probably be found, though abundant in individuals, not to comprise many new forms. The chief manufactures are coir, mats, and cloth.

The general map of the group is from Imray's 'Islands in the Indian Ocean'; another one shows their relation to the Hindostan peninsula.

Gill [the late Captain] William.—The River of Golden Sand: being the Narrative of a Journey through China and Eastern Tibet to Burmah. Condensed by Edward Colborne Baber, Chinese Secretary to H.M.'s Legation at Peking. Edited, with a Memoir and Introductory Essay by Colonel Henry Yule, C.B., R.E. London (John Murray): 1883, post 8vo., pp. [141] and 332, maps, plates, and woodcuts. Price 7s. 6d.

A very excellent abridgment of the original edition in two large octavo volumes (noticed in vol. ii. of our 'Proceedings,' N.S.), the Introductory Essay prefixed to which has been modified and brought to date by Col. Yule, who has added a valuable memoir of the lamented author, based on a sketch (also by Col. Yule) in the privately circulated *Royal Engineers' Journal*. The introduction, which is accompanied by a sketch map of the complex system of great rivers on the Tibeto-Chinese frontier (scale 176 miles to the inch), will serve as a lucid summary of the existing state of our knowledge of this difficult and most interesting region.

The illustrations, in addition to the few that appeared in the original edition, are derived mainly from drawings made under Captain Gill's supervision from his own rough sketches; some also are added from Kreitner's narrative of Count Széchenyi's Tibetan expedition. Two portraits of the deceased author are given.

Lortet [Le Dr.].—La Syrie d'aujourd'hui. Voyages dans la Phénicie, le Liban, et la Judée, 1875–1880. Paris (Hachette): 1884, 4to., pp. 675 [no index], maps, illustrations. Price 2l. 10s.

This profusely and finely illustrated work (it contains 361 engravings) is collected from the *Tour du Monde* of the same publishers, in vols. xxxix. to xliv. (1880–1882) of which it originally appeared. Dr. Lortet left Marseilles in March 1875, and reached Alexandretta by Messina, Syra, Smyrna, Rhodes, and Mersina. Thence he worked southwards to Latakia, Tripoli, Beirut, Jaffa, Port Said, and

Alexandria, making numerous long excursions in Palestine and the Lebanon, his furthest eastern point being Lake Kibliyah in El Merj east of Damascus, and his most southern Bir-es-Seba (he also worked along the western shore of the Dead Sea as far south as Masada).

His attention was not, as is often the case, exclusively devoted to archaeological objects or the identification or illustration of scriptural localities. Those necessarily predominate, but he has not omitted to notice the great physical features of the region, natural history objects, the habits of the people, or incidents of daily life; so that his work has a general value, materially augmented by the fidelity and excellence of the illustrations, many of which are from photographs.

The finely executed largest map (scale 1 : 500,000, or 8 miles to the inch) comprises country east of the Anti-Lebanon, the Jordan, and the Dead Sea, and is based upon the best English, German, and French authorities.

Marvin, Charles.—The Petroleum of the future. Baku: the Petrolia of Europe. A[n] Historical Sketch, showing the immense and inexhaustible character of the petroleum deposits of the Caspian region, from the earliest times. London (R. Anderson & Co.): [1883] 8vo., pp. 36, map. Price 1s.

The author, late special correspondent of the *Morning Post* newspaper in the Caspian region, claims to have made a special study of the petroleum fields of Baku, various well-known published accounts of which compose his present publication. The map, "drawn by Charles Marvin," comprises from the eastern shore of the Caspian to the western of the Euxine, on the scale of 111 miles to the inch, and is of course quite valueless for any special purpose, the author not being apparently acquainted with Goolishambarow's excellent map of the Apscheron peninsula (with appended statistics) showing petroleum wells, oil refineries, &c., published at St. Petersburg by Schmitzdorf in 1882.

Phillipps-Wolley, Clive.—Savage Svänetia. London (Bentley): 1883, 2 vols. post 8vo., pp. ix. and 272, and 250 [no index], illustrations. Price 21s.

The author, who travelled for sport, gives a brightly written description of the present condition of the Radscha and Suanetia or Swannety (the upper valleys of the Rion and Ingur, Central Caucasus; vaguely given in the sketch map on the cover of the book as covering parts of Mingrelia and Imeritia). His route was from Kutais to the source of the Rion, Suanetia being reached by the route first followed by Mr. Freshfield through the upper glens of the Tskenis-Tskali (locally called Lapdr, apparently). Some of the illustrations are misplaced, and some are duplicates of those in former works.

Rein, [Prof.] J. J.—Japan: Travels and Researches undertaken at the cost of the Prussian Government. London (Hodder & Stoughton): 1884, roy. 8vo., pp. xi. and 543, maps and illustrations. Price 11. 5s.

This work is based upon a residence of nearly two years in Japan, and extensive journeys through the islands of Hondo, Shikoku, Kiushiu, and Amakusa, in the years 1874 and 1875, with the object of studying the trade and special industries of Japan, under a commission of the Prussian Ministry of Commerce. These subjects are to be discussed in another volume; and the present one is a translation (practically a revision) of the German edition of the geographical and general section, published at Leipzig by Engelmann in 1880, and noticed in our 'Proceedings' for 1881, p. 60. The work is likely to remain a standard authority.

Schliemann, [Dr.] Henry.—Troja: Results of the latest Researches and Discoveries on the Site of Homer's Troy, and in the heroic tumuli and other sites, made in the year 1882; and a narrative of a journey in the Troad in 1881. Preface by Professor A. H. Sayce. London (John Murray): 1884, large 8vo., pp. xl. and 434, maps, plans, and 139 woodcuts. Price 21. 2s.

The present volume may be considered as the supplement and completion of the author's 'Ilios,' the conclusions of which are to some extent modified and corrected. Every ancient site in the Troad has now been explored; Bounarbashi on

the Bali Dagh is proved to have no claims to represent the site of a prehistoric city, and besides Hissarlik there are in the Trojan plain only two other sites of prehistoric age, viz. the mounds of Hanaï and Besika. It is considered to be definitely proved that if Troy existed it could only have been at Hissarlik, the inhabitants of the first two prehistoric cities of which place must, from the evidence unearthed, have differed in race from those of the other two acknowledged prehistoric sites. But on crossing to Europe, the so-called tumulus of Protesilaus was found to have been raised on the site of a remotely ancient city, affording remains precisely the same as those of the lowest Hissarlik strata, and pointing to the conclusion that the builders of the first city at the latter place must have come across the Hellespont and have been of Thracian descent. The second prehistoric city, and probably also the first, is now considered not to have been confined to the hill of Hissarlik, which was merely a citadel; and it is now on fresh evidence believed that the burnt city was not the third (as formerly supposed) but the second, the distinct periods in the history of which can be traced. Among the objects discovered in the ruins of this second city, identified as Iliion, there are none showing traces of Phœnician or Assyrian origin, but many exhibiting the influence of modified archaic Babylonian art, assumed to have been introduced by the so-called Hittite tribes. The fall of this second city is therefore not likely to have been later than the twelfth century before the Christian era, when the Phœnicians had planted flourishing colonies in Thera and Melos; and 1183 B.C., the date given by Eratosthenes, is considered to agree wonderfully well with the modern archæological indications.

The present volume is brought out with all the minuteness of detail and excellence of illustration that characterised its predecessors. The map represents the whole Troad with author's routes, and a revision of Graves and Spratt's survey of the Plain of Troy and the surrounding country on a larger scale ($1\frac{1}{2}$ miles to the inch); the plans are of the Acropolis of the second city, and the Homeric Troy and later Ilium.

The last appendix contains meteorological observations at Hissarlik, April-July 1882; the first one is a long and interesting account (pp. 303-347) of the author's general journeys in the Troad in 1881, which embodies various observations of a topographical and geographical nature.

Vámbery.—Arminius Vambéry: his life and adventures written by himself. London (T. Fisher Unwin): 1884, 8vo., pp. 370, portrait and illustrations [no index]. Price 16s.

Although the author's adventures and the geographical and political aspects of his celebrated journey in 1862-64 through Persia, across the Turkoman desert to Khiva, Bokhara, and Samarcand, have been familiar since the publication in the latter year by Murray of the 'Travels in Central Asia,' the present volume will be found interesting from the details of its strictly personal narrative. Apart from the earlier biographical account, and the concluding chapters which relate to the author's reception by this Society and the eminent geographers and politicians by whom he was welcomed, there is much information on minute topographical, linguistic, and ethnological points interwoven in the description of M. Vámbery's experiences, which are given in a manner likely to commend the volume to general readers.

The illustrations are not to be compared with Zwecker's drawings in the original work.

AFRICA.

Curt, Robert Needham.—A Sketch of the Modern Languages of Africa, accompanied by a Language-Map. London (Trübner & Co.): 1893, 2 vols., 8vo., pp. xvi. and 1-287, 288-566, portraits, map in covers. Price 25s.

The author, who disclaims any special knowledge of his subject, here brings together, from published and unpublished sources, all available matter bearing upon African languages, which he treats upon a geographical basis (ethnological arguments being avoided). A history of the progress of our knowledge in this

direction is given, with a discussion of the connected extinct, dead, alien, and mixed tongues. F. Müller's classification (Semitic, Hamitic, Nuba-Fulah, Negro, Bantu, and Hottentot-Bushman) is accepted as a basis; and the acknowledged sources of information and of materials supplied are such as to inspire confidence in the work as comprehensive to date. In treating of the different families, general remarks of geographical, ethnological, and historical character are made. The map, by Mr. E. G. Ravenstein (scale 1:8,000,000) shows the distribution of the different language-families on the African continent by conspicuous colour differences; the portraits are photographic reproductions of the likenesses of the most conspicuous modern African travellers, linguists, missionaries, &c.

Stuart, H. Villiers.—Egypt after the War, being the Narrative of a Tour of Inspection (undertaken last autumn) including experiences among the natives, with descriptions of their homes and habits. In which are embodied notices of the latest archæological discoveries, and a revised account of the funeral canopy of an Egyptian Queen, with interesting additions. London (John Murray): 1883, large 8vo., pp. xx. and 492 [no index], maps, plans, and illustrations. Price 1l. 11s. 6d.

The author gives details of his experiences among the fellahs of the Delta and Middle and Upper Egypt, where he travelled last winter with the object of obtaining information at first hand on local administration, agricultural points, and the political opinions of the natives. The dry results have already been published in a Blue Book, to which are added various particulars of the recent campaign and its consequences, with portions of the proposed second edition of the "Tent of an Egyptian Queen" and notices of the most recent archæological discoveries, together with some account of the author's own latest explorations.

Mr. Stuart gives amongst his numerous illustrations a plate of the insect which he imagines to be the sacred beetle of the ancient Egyptians, saying that naturalists differ as to its modern representative. There is, however, no difference of opinion existing or possible on this point; *Scarabæus sacer* and its habits are universally recognised, and the author's insect is the male of *Heliocopris isidis*, which he wrongly says carries "balls of wet Nile mud on his head to his mate to deposit her eggs in." These beetles burrow in animal excrement, carrying down a portion as a nidus for the egg; the *Scarabæus sacer* is the only species that actually rolls pellets (of excrement, not mud) from one place to another.

Wilmot, A.—Geography of South Africa for the use of Higher Classes in Schools. 3rd edition. Cape Town (J. C. Juta): 1883, 12mo., pp. 128, maps.

This little manual, which is apparently largely used in the Colony and adjoining States, gives in a small space much local information not easily obtainable in England. It has been carefully revised to date (August 1883). The map is clearly executed, and not overburdened with names.

AMERICA.

Bishop, William Henry.—Old Mexico and her lost Provinces. A Journey in Mexico, Southern California, and Arizona, by way of Cuba. London (Chatto & Windus): 1883, 8vo., pp. x. and 509 [no index], illustrations. Price 10s. 6d.

The first half of this excellently illustrated little volume is descriptive of Mexico of to-day, the remainder being occupied with the author's experiences in California and Arizona. Some small sized sketch maps are given in the text.

Doering [Dr.] Adolfo.—Informe Oficial de la Comision Científica agregada al Estado Mayor General de la Expedicion al Rio Negro (Patagonia) realizada en los meses de Abril, Mayo, y Junio de 1879, bajo las órdenes del General D. Julio A. Roca. Entrega III. Geología. Buenos Aires (Ostwald): 1882, 4to., pp. 299-530.

The library of the Society has just received, through the kind offices of the Córdoba National Academy of Sciences, the above-mentioned third part of the

descriptive account of the scientific results of General Roca's Expedition to the Rio Negro, of which the earlier portions are referred to in our 'Proceedings' for 1882, p. 445. A fourth part, containing the Palæontology, is to complete the work; in the present one, a physiographical sketch is given of the different systems under which the geological features are discussed.

Greenwood, Thomas.—A Tour in the States and Canada. Out and Home in Six Weeks. London (L. Upcott Gill): 1883, post 8vo., pp. 170, illustrations. Price 2s. 6d.

Solely of interest to tourists. Some details of the manufacturing centres are given.

Guzmán, David J.—Apuntamientos sobre la Topografía física de la República del Salvador, comprendiendo su Historia Natural, sus Producciones, Industria, Comercio y Inmigración, Climas, Estadística, &c. San Salvador (Tipografía de "El Cometa"): 1883, 8vo., pp. 525.

This work (for a copy of which the Society is indebted to H. M. Foreign Office, through Earl Granville) is divided into eight sections, as follows:—(1) General Geography, with a special reference to the earthquakes and volcanic eruptions, which play so important a part in alterations of topographical features here; (2) Hydrography, including notices of thermal and medicinal waters; (3) Geology, including palæontology; (4) Mineralogy, in which the economic importance of mining industries for the country is pointed out; (5) Botany, including agriculture and arboriculture; (6) Zoology, with a separate chapter on climate interpolated; (7) Acclimatisation and Immigration; (8) Ethnology, government, habits and customs, and religion. The want of an index materially detracts from the utility of this comprehensive work.

Knight, E. F.—The Cruise of the *Falcon*. A Voyage to South America in a 30-ton Yacht. London (Sampson Low & Co.): 1884, 2 vols. post 8vo., pp. 301 and 304 [no index], maps and illustrations. Price 1l. 4s.

The author, with three friends and a boy, sailed to Madeira, the Cape Verdes, Bahia, Rio, Montevideo, and Buenos Aires, making various excursions in the Argentine States, as far as Tucuman and Santiago del Estero, and then working up the Parana and Paraguay to Asuncion. On the return voyage, a landing was effected on Trinidad, some 700 miles east of the Brazilian coast, and pp. 200-243 of vol. ii. are devoted to a description of the author's experiences on that very little known and desert island, with illustrations of its rocky scenery, and of the Martin Vas islets, 26 miles off.

Trinidad was found a wild and uninviting spot, a precipitous mass of barren volcanic rock, with lofty inaccessible summits, the whole surface being studded with sharp needle-like peaks. Myriads of sea-fowl, fearless from ignorance of man, covered the island, the waters round which teemed with fish in incredible numbers. Repeated attempts to reach the land in a boat having been made in vain, the author and one companion succeeded in swimming ashore through the breakers, but all their endeavours to ascend the cliffs were frustrated by the rotten and crumbling nature of the basaltic columns of which they are composed, and which have apparently been burnt and shaken to pieces by volcanic action. No living vegetation was at first seen, but wherever there was room for the growth, dead leafless trunks of considerable size were closely strewn, destroyed, all at the same time, probably by some volcanic eruption within the memory of man. A night was spent on this desolate spot, which afforded plenty of food in the shape of swarms of land-crabs. Regaining their boat by swimming, another attempt was made to find a landing-place by coasting among the firds and rocky islets, and at last a practicable beach was found in South-West Bay, and an ascent of the mountains made by a ravine down which a stream of clear cold water ran. Passing beyond the belt of dead trees, at first only wiry long grass was seen, followed at a greater elevation by tree-ferns increasing in size with the height. At the summit of the ravine, the rocks disappeared, being replaced

by a dry powdery soil, into which the feet sank, and the nearest mountain dome was covered with rich and beautiful vegetation, the travellers walking through dense groves of tree-ferns, the soft ground beneath which appeared alive with millions of crawling land-crabs. Other life there was none, not even an insect being seen. Arrived at the summit, a magnificent view of the eastern side of the island was obtained: huge pyramidal cylinders of burnt rock towered around, based on gigantic slopes of ruddy coloured débris, continued to the sea by vivid green downs (covered with rope-like creepers) and white sand beaches, rendered wholly inaccessible by reefs and black rocky islets on which the sea broke furiously. A second night was spent among the rocks, under somewhat dangerous circumstances and difficulties from want of water, and in the next day's wanderings the windward shore of the island was reached, and found to be strewn with the accumulated wreckage of hundreds of years. After another night, a final and fruitless attempt was made to discover any trace of living trees similar to those found dead in such numbers, or of the pigs and goats reported by Delano to have existed there in plenty in 1808.

From Trinidad, the author returned to Bahia and then sailed along the Brazilian coast to Georgetown, reaching England by the Antilles and Azores.

Lefroy, R. A., Lieutenant [now General Sir J. H. Lefroy, C.B., K.C.M.G., F.R.S., &c.].—*Diary of a Magnetic Survey of a portion of the Dominion of Canada, chiefly in the North-western Territories, executed in the years 1842-1844.* London (Longmans, Green & Co.): 1883, large 8vo., pp. 192, maps and tables. Price 21s.

This volume contains the details of the observations recorded in Sabine's 'Contributions to Terrestrial Magnetism,' originally published in the 'Philosophical Transactions' for 1846 and 1872, and which are now given in their geographical connection, with many observations of latitude and longitude, and in a form more convenient for reference, with especial view to the renewed attention directed to the distribution and periodical changes of the earth's magnetism in the north Polar region. The general evidence is conclusive that on middle latitudes on the American continent the earth's magnetic force is now decreasing, and has been decreasing for about thirty-five years. The author calls attention to the marked influence of geological features on the course of the iso-magnetic lines.

AUSTRALASIA.

Brodribb, [Hon.] W. A.—*Recollections of an Australian Squatter, or Leaves from my Journal since 1835.* Sydney (John Woods & Co.): [1883], 8vo., pp. 237.

Apart from any historical interest as regards development of colonial industries, this little work contains brief notes on the author's explorations and journeys in Gippsland, the Australian Alps, &c., in the early days of settlement.

Green, [the Rev.] William Spotswood.—*The High Alps of New Zealand, or a Trip to the Glaciers of the Antipodes, with an ascent of Mount Cook.* London (Macmillan): 1883, post 8vo., pp. xiv. & 350 [no index], maps, sections, and frontispiece. Price 7s. 6d.

The main features of Mr. Green's journey to the Southern Alps have appeared in the 'Transactions of the Royal Irish Academy' and the *Alpine Journal*, as well as in the daily papers; the author has also read a paper on the same subject before a recent evening meeting of this Society; nevertheless the present volume will be acceptable not only to mountaineers, but to a large circle of general readers, who, apart from the interest of a narrative of dangerous personal adventure, cannot fail to appreciate the descriptions of unhackneyed scenes in the Antipodes.

The elevation of Mount Cook was found to be 12,317 feet from temperature observations, as against the trigonometrical height of 12,349 feet. For the benefit of Colonial explorers, Mr. Green gives in an appendix some practical hints on mountaineering work. ■

Hector, James.—Colonial Museum and Geological Survey Department. Handbook of New Zealand. Wellington (By authority : George Didsbury, Government Printer) : 1883, 8vo., 3rd edition, revised, pp. viii. and 147, maps and plates.

The admirable and exhaustive 1875 'Handbook of New Zealand,' by Sir Julius Vogel, being not only out of date but out of print, the director of the Geological Survey brought out the first edition of the one now under notice on the occasion of the Sydney Exhibition of 1879; a second edition was also prepared for the 1882 Melbourne Exhibition, and is presumably exhausted. Containing naturally much matter on economic subjects of chief interest to settlers, this handbook, as might be expected from its author, also includes the chief scientific aspects of the geography, geology, zoology, and botany of New Zealand, special attention being given to the indigenous forest trees and mineral waters.

The general map is on the scale of 40 miles to the inch, and bears condensed statistical results (including distances); the coloured geological map is smaller, with explanatory sections.

GENERAL.

Coppinger, R. W.—Cruise of the *Alert*. Four years in Patagonian, Polynesian, and Mascarene Waters (1878-82). London (W. Swan Sonnenschein & Co.) : 1883, 4to., pp. xiii. and 256, illustrations. Price 21s.

The original objects of the equipment of the old Arctic vessel the *Alert* (at first under Sir Geo. Nares, and subsequently under Captain J. Maclear), were a continuation of the survey of the Straits of Magellan, an investigation of the nature and position of certain doubtful reefs and islands in the South Pacific (mainly in connection with Fiji), and the survey of a portion of the northern and western coasts of Australia. The latter part of the work was, however, not carried into effect, as operations in connection with the Amirante group and soundings on the east coast of Africa were substituted for it. Dr. Coppinger was appointed medical officer to the expedition in consequence of his natural history tastes and experiences, it being the wish of the Hydrographer that the opportunity of making collections and observations in regions little known to science should not be thrown away. This wish is amply fulfilled by Dr. Coppinger's volume, which is full of scientific notes of geographical, topographical, ethnological, and botanical interest, bearing on the area of the *Alert's* operations; its accompanying excellent illustrations are mostly from photographs taken by Mr. Fredk. North during the cruise.

The work concludes with descriptions of the Seychelles, Amirante group, Alphonse and Providence Islands, with some smaller outlying islets.

Scribner, G. Hilton.—Where did Life begin? A brief enquiry as to the probable place of beginning and the natural courses of migration therefrom of the Flora and Fauna of the Earth. New York (Charles Scribner's Sons) : 1883, cr. 8vo., pp. 64.

The author thinks that vegetable and animal life first commenced at the poles, because, admitting that the earth was too hot originally to support either, they must from their flattening have more quickly radiated their primitive caloric, and subsequently received less from the sun than other parts of the world's surface; the poles therefore must necessarily first have arrived at the temperature at which it is possible for life to exist. The surface formation (especially the north and south trending of the great mountain ranges and rivers) is relied upon as promoting a southern migration; and the discovery in the Arctic regions of fossil organic remains exceeding present tropical developments is adduced as evidence of the existence of very favourable conditions of life in the north at a remote period.

The arguments are all based on the Arctic regions; the Antarctic being dismissed with a reference to the theory of alternation of submergence of the hemispheres in each period of 26,000 years by the eccentricity of the earth's orbit driving off the polar ice accumulations (which could not have been formed round warm poles). The existence in the southern hemisphere of the most primitive fauna and flora known, viz. of Australia, which is as close to the Equator on the south as Hindostan is to the north, is not alluded to.

Tangye, Richard—Reminiscences of Travel in Australia, America, and Egypt. London (Sampson Low & Co.): 1883, 8vo., pp. xiv. and 290, illustrations. Price 6s.

A record of recent experiences of travel in Victoria, Tasmania, New South Wales, the Pacific, Northern United States, and Egypt.

NEW MAPS.

(By J. COLES, *Map Curator R.G.S.*)

EUROPE.

Bayern.—Positionen-Karte vom Königreich—. Bearbeitet im topographischen Bureau des königlich bayerischen Generalstabes. Scale 1:25,000 or 2·9 inches to a geographical mile. No. 612, Ichenhausen. 643, Gessertshausen. 665, Illertissen. 666, Buch. 667, Krumbach. 689, Illereichen. 692, Pfaffenhausen. 693, Tussenhausen. 712, Fellheim. 713, Sontheim. 714, Mindelheim. 715, Mattsies. München. Price 1s. 3d. each sheet. (*Dulau.*)

Central-Europa, Neue Uebersichtskarte von—, resp. der oesterreichisch-ungarischen Monarchie. Scale 1:750,000 or 10·3 geographical miles to an inch. Herausgegeben vom k. k. militär-geograph. Institute, Wien. Price 2s. each sheet. (*Dulau.*)

The following sheets are just published:—

Explanation of signs, &c. C 1. Posen, Glogau, Schweidnitz, Oppeln, Kalisz. D. Königsburg, Guttstadt, Bielostok, Suwalki. D 1. Warschau, Lublin, Nowo-Georgiewsk. D 2. Krakau, Przemyśl, Jaroslau, Kaschau, Leutschau. D 3. Szegedin, Grosswardein, ó Arad, Erlau, Szolnok. E 1. Brest-Litowskij, Pinsk, Ostrog, Kolki. E 2. Tarnopol, Brody, Stryj, Ozerowitz. E 3. Klausenburg, Máramaros-Sziget, Tölgyes. F. Bobrujok, Czerikow, Str., Szklow. F 1. Kijew, Žitomir, Owruoz, Czernobyl, Mozyr, Loiew. F 2. Balta, Uman, Braclaw. F 3. Bielcy, Kisziniew, Jassi.

— Geologische Karte von—, nach den grösseren Materialien bearbeitet von H. Bach. Scale 1:2,630,000 or 36 geographical miles to an inch. Stuttgart, 1884, Schweizerbart. Price 8s. (*Dulau.*)

Deutschen Reiches, Karte des—. Herausgegeben von der kartogr. Abtheilung der Königl. Preuss. Landes-Aufnahme 1883. Scale 1:100,000 or 1·3 geographical miles to an inch. Sheets:—117, Güstrow. 267, Rathenow. 292, Brandenburg a. d. Havel. 384, Cassel. 554, Saarlouis. 555, St. Wendel. 584, Solgne. Price 1s. 6d. each. (*Dulau.*)

— Distanz- und Eisenbahn-Karte von R. A. Schulz. Zur Uebersicht aller Haupt-Routen in sämtlichen Staaten von Deutschland mit Einschluss der ganzen Oesterreich-Ungarischen Monarchie, Belgien, der Niederlande und der Schweiz, nebst Theilen von Frankreich, England, Italien, Russland und der Balkanländer. Scale 1:4,100,000 or 56·1 geographical miles to an inch. Wien, Verlag von Artaria & Co. Price 1s. (*Dulau.*)

This map gives the distances between all the principal cities and towns, in German miles, and the time in hours occupied by the sea routes. The scale is very small, but as the distances are given in figures it will be useful for reference where distances are concerned.

Elsass-Lothringen, Das Reichland—, nach seiner territorialen Gestaltung von 1648–1789. Scale 1:150,000 or 2·1 geographical miles to an inch. Von Dr. M. Kirchner. Strassburg, Trübner. 4 sheets. Price 8s. (*Dulau.*)

France.—Carte des voies navigables et des chemins de fer de la—, et carte speciale dressée au point de vue du port Saint-Louis-du-Rhône. Paris, Chaix. (*Dulau.*)

Italia.—Carta delle Circoscrizioni militari del Regno d'Italia, compilata dal Captn. P. Campiglio. Scale 1:1,111,111 or 15·2 geographical miles to an inch. Roma. 6 sheets. Price 6s. (*Dulau.*)

Mittel-Europa, Specialkarte von—, nach den neuesten und besten amtlichen Quellen bearbeitet von W. Liebenow. Scale 1:300,000 or 4·1 geographical miles to an inch. Hannover, Oppermann. Sheets:—43 Groningen, 44 Bremen, 45 Lüneburg, 46 Wittenberge, 56 Zwolle, 57 Minden, 58 Hannover, 59 Magdeburg. Price 1s. 6d. each. (*Dulau.*)

West-Russland, General- und Strassenkarte von—, und den angrenzenden Ländern bis Wien und Budapest. Bearbeitet von G. Freytag. Scale 1:1,500,000 or 20·4 geographical miles to an inch. Verlag und Eigenthum von Artaria & Co. Wien. Price 3s. (*Dulau.*)

This map shows the extension of railway communication in West Russia up to the present date, and the lines projected and under construction; all post, transport, and bye roads are given. The chief city of each province is distinguished by having one red line beneath it, and the city where the government offices are established by a double red line. A marginal table gives the name of each government, the number of its subdivisions, its area in square kilometres, its population, and the number of inhabitants to each square kilometre. This is indeed an instance of the large amount of useful statistical information which is often to be found in the marginal notes of maps published in Austria and Germany.

ORDNANCE SURVEY MAPS.

Publications issued from 1st to 31st October 1883.

1-inch—General Map:—

IRELAND: Sheet 123 (Hill-shaded), 1s.

6-inch—County Maps:—

ENGLAND: **Berkshire** (part of): Sheet 37 filled in with sheet 58 (Oxfordshire); 2s. 6d. **Buckinghamshire** (part of): sheet 39; 2s. 6d. **Cornwall** (part of): Quarter sheets, 12 N.E.; 14 N.W., 14 N.E.; 15 N.W., 15 N.E., 15 S.W., 15 S.E.; 22 S.W.; 23 S.E.; 28 N.W., 28 N.E., 28 S.E.; 29 N.W., 29 N.E.; 1s. each. **Derbyshire** (part of): Quarter sheet, 25 N.W. with Contours; 1s. **Devonshire** (part of): Quarter sheets, 73 N.W., 73 N.E., 73 S.W., 73 S.E.; 85 N.W.; 86 N.W., 86 N.E., 86 S.W., 86 S.E.; 96 N.E., 96 S.E.; 111 N.W., 111 N.E., 111 S.E.; 1s. each. **Gloucestershire** (part of): Quarter sheets, 10 S.E. with 53 S.E. (Worcestershire); 34 N.W., 34 N.E., 34 S.W.; 36 S.W.; 1s. each. **Oxfordshire** (part of): Sheet 58 filled in with sheet 37 (Berkshire); 2s. 6d. **Shropshire** (part of): Quarter sheets, 39 S.W. with 24 S.W. (Montgomeryshire); 65 S.W.; 69 N.W., 69 N.E., 69 S.E.; 70 N.W., 70 N.E.; 71 N.E.; 73 S.W.; 74 S.W.; 84 N.W.; 1s. each. **Suffolk** (part of): Quarter sheets, 18 N.W., 18 N.E., 18 S.W., 18 S.E.; 19 N.W., 19 N.E., 19 S.W., 19 S.E.; 28 N.W., 28 N.E., 28 S.W., 28 S.E.; 29 N.W., 29 N.E., 29 S.W.; 49 N.E., 49 S.W.; 50 N.E.; 60 N.E.; 68 N.W., 68 N.E.; 1s. each. **Wiltshire** (part of): sheet 49 filled in with sheet 15 (Hampshire); 2s. 6d.

IRELAND: **Longford** (revised): Sheets 19, 23; 2s. 6d. each. **Meath** (revised): Sheet 8; 2s.

25-inch—Parish Maps:—

ENGLAND: **Bedford**: Wrestlingworth, 6 sh. **Cornwall**: St. Beward, 21. **Derby**: Egginton, 10 and Ar. Bk. Osmaston, 4 and Ar. Bk. Smisby, 5 and Ar. Bk. St. Alkmund, 7 and Ar. Bk. St. Michael, 9 and Ar. Bk. St. Peter, 12 and Ar. Bk. St. Werburgh, 2 and Ar. Bk. **Norfolk**: Brandon Parva, 6 and Ar. Bk. Coston, 2 and Ar. Bk. Garveston, 5 and Ar. Bk. Great Ellingham, 9 and Ar. Bk. Hardingham, 8 and Ar. Bk. Mattishall Burgh, 4. Reymerston, 6 and Ar. Bk. Runhall, 5 and Ar. Bk. Southburgh, 6 and Ar. Bk. Thuxton, 3 and Ar. Bk. Welborne, 6 and Ar. Bk. Whinburgh, 4. Wilby, 6. **Shropshire**: Barrow, 12 and Ar. Bk. Chirbury, 22. Leebotwood, 4 and Ar. Bk. Madeley, 10 and Ar. Bk. **Suffolk**: Barnham 13, Barningham 5, Benhall 7, Hacheston 5, Rushmere 6, Stratford St. Andrew 4.

Town Plans—5 feet scale:—

IRELAND: Bandon, 7 sheets, 2s. each. Belfast (revised), 5 sheets, 2s. each.

Index Map:—County Index Map of Argyllshire and Buteshire. Scale 4 miles to 1 inch, 2s. 6d.

ASIA.**Indian Government Surveys:—**

India 1882. 128 miles to an inch. Skeleton edition. Corrections to February 1883.—**Indian Atlas**. Sheet 108 (parts of Vizagapatam, Ganjam, &c.). 4 miles to an inch. Additions to 1877.—**Bombay Presidency**:—Trigonometrical Branch, Survey of India. Sheet No. 76 of Guzerat. Parts of Gáikwár's Territory and of the Pálanpur and Thara States. 1 inch to a mile. Season 1881-82.—Deccan and Konkan Topographical Survey. Sheet No. 14 N.W. Districts Thana and Nasik. 2 inches to a mile. Seasons 1875-77 and 1879-80. Sheet 14 S.W. Districts Thana, Nasik, and Ahmednagar. 2 inches to a mile. Seasons 1875-77 and 1879-80. No. 22 N.W. and 22 S.W. Districts Poona and Thana. 2 inches to a mile. Seasons 1877-78 and 1879-80. No. 26 N.W. Districts Poona and Thana. 2 inches to a mile. Seasons 1876-77 and 78. No. 62. Districts Sholapur and Kaladgi, Nizam's Dominions and Kolhapur Agency. 1 inch to a mile. Seasons 1879-80-81. No. 75. Poona, Thana, and Kolaba Districts, and Habsau and Bhor States. 1 inch to a mile. Seasons 1879-81. No. 76. Districts Poona, Thana, and Kolaba. 1 inch to a mile. Season 1880-81. Nos. 76 N.W., 76 N.E., 76 S.W., and 76 S.E. Districts Thana, Poona, and Kolaba. 2 inches to a mile. Season 1880-81. No. 77. District Thana. 1 inch to a mile. Season 1880-81.—**Bengal Presidency**:—Skeleton Map of the Punjab and surrounding countries. 1874. With additions to 1883. 33 miles to an inch.—North-West Provinces Survey. Sheet No. 4 N.W., N.E., S.W., and S.E. Districts Saharanpur and Muzaffarnagar. 2 inches to a mile. Seasons 1878-79-80. No. 32. (East) District Moradabad. 1 inch to a mile. Seasons 1873-74 and 1876-77. No. 34. District Budaun. 1 inch to a mile. Season 1876-77. No. 124. District Banda. 1 inch to a mile. Season 1875-76.—Oudh Revenue Survey. 1 mile to an inch. Districts Fyzabad and Sultanpur. Season 1861-62.—District Raipur (Central Provinces). 4 miles to an inch. Seasons 1862-64 and 1866-72. (Taken from Sheets 91 and 92 of the Atlas of India).—District Rajshahee, Bengal. 4 miles to an inch. Taken from Sheets Nos. 119 and 120 of the Atlas of India).—North-East Frontier Topographical Survey. Sheet No. 1 (Part of South Sylhet). 2 inches to a mile. Seasons 1877-79.—Lower Provinces Survey. District Patna. Patna City. 10 inches to a mile. Season 1865-66.—Bankipore Civil Station. District Patna. Season 1864-65. 10 inches to a mile. 2 sheets.—**Madras Presidency**:—Mysore Topographical Survey. 1 inch to a mile. Sheets Nos. 10 and 11. Parts of Chitaldroog and Shimoga Districts. Season

1881-82. No. 14. Part of Chitaldroog District. Season 1881-82. No. 15. Parts of Chitaldroog and Tùm-kúr Districts. Season 1881-82. No. 19. Part of Shimoga District. Seasons 1880-81-82. No. 25. Part of Kadur District. Seasons 1879-82. No. 30. Parts of Hassan, Kadur, and Tùm-kúr Districts. Seasons 1880-81-82.—**Trans-Frontier Maps**:—(Reconnaissance) Eastern Naga Hills and Manipur with adjoining portions of Burmah. Surveyed during the years 1872 to 74 and 1881-82. 1 inch to 4 miles. 2 sheets.

AFRICA.

Bammako, Carte de l'Etat de—, exécutée par ordre de M. le Lieut.-Col. Borgnis-Desbordes, par Delanneau. Mars 1883. Scale 1:100,000 or 1·3 geographical miles to an inch. Paris. (*Dulau*.)

Congo, Le—, depuis l'Équateur jusqu'à l'Océan et la Vallée du Niadi-Kwilu. Scale 1:1,300,000 or 17·8 geographical miles to an inch. Institut National de Géographie, Bruxelles. Novembre 1883.

This map, which is published by the "Institut National de Géographie" of Brussels, exhibits the progress made in the exploration of the Congo district and the Niadi-Kwilu valley; this latter is for the most part new. There are also important alterations and additions to the previously published maps of the Congo district, notably the change which has been made in the positions of Stanley Pool and all places east of it, these have all been moved about one-degree in longitude farther west, and the entrance of the Edwin Arnold River is also moved to the west. The course of the Congo between Manyanga and Stanley Pool has, in consequence of the above corrections in longitude, been altered considerably, and the distance between these places reduced to about one half that given on Stanley's original map. Two large lakes, called severally Lake Mohumba and Lake Leopold II., are shown, but from a note, it appears that their positions in latitude and longitude are only approximate, the observations taken by Mr. Stanley not having yet been computed. Lake Mohumba is shown as being 32 geographical miles long and 8 miles broad, and Lake Leopold II. as 70 geographical miles long and varying from 6 to 30 miles broad. The positions of twenty-seven stations are given, the most advanced being "Équateur-Station," which is indeed nearly on the equator itself.

Egyptian Sûdan, Map of the—, Compiled and lithographed at the Intelligence Branch, War Office, under the direction of Major W. R. Fox, R.A., D.A.Q.M.G. December 1883. Scale 1:253,080 or 30·8 geographical miles to an inch.

This is a new edition of the map of the Egyptian Sûdan previously published by the Intelligence Branch of the Quartermaster-General's Department. The map has been improved by having the lakes coloured and the addition of two inset maps—one of Khartoum and environs, scale 1:40,000 or 1·8 inches to a geographical mile; the other of Egypt Proper, Nubia, and the Egyptian Sûdan, scale 1:6,336,000 or 86·8 geographical miles to an inch.

Egypt.—A Map of the Nile from the Equatorial Lakes to the Mediterranean, embracing the Egyptian Sûdan (Kordofan, Darfur, &c.), and Abyssinia. 1883. Scale 1:5,977,382 or 81·6 geographical miles to an inch. E. Stanford, London. Price in sheet, coloured, 4s.; mounted to fold in cloth case, 6s. 6d.

This map shows the approaches to Khartoum by the Red Sea routes, via Massowah, Kassala, &c., and via Suakin, Berber, &c., and by the Nile routes via Korosko, Abu Hammed, &c., and via Wady Halfa, Dongola, &c. It extends to Uganda and includes the great bend of the Congo.

The British possessions at Aden and Perim, at the entrance of the Red Sea, the French station at Obok in the bay of Tajurrah, and the Italian settlement at Assab Bay, are indicated; the explorations of recent travellers appear to be given with as much detail as the scale permits.

Suâkin and Berber, Sketch Map of Routes between——. Scale 1:760,000 or 10·4 geographical miles to an inch. From the route sketches and reports of Schweinfurth, Heuglin, Prout, De Cosson, Watson, and Stewart (1883). Compiled and lithographed in the Intelligence Branch, War Office, under the direction of Major W. R. Fox, B.A., D.A.Q.M.G. December 1883.

Tripolitania e Cirenaica, Carta Economica della——, dedicata a S.A.R. Il Duca di Genova. Pubblicata dalla Società di Esplorazione Commerciale in Africa sotto la direzione del Cap^o. M. Camperio secondo gli ultimi viaggi di G. Schweinfurth, Dott. Freund, Cap^o. Camperio, P. Mainoli e Comm. Haimann. 1883. Scale 1:3,500,000 or 47·6 geographical miles to an inch. Artaria di Ferd. Sacchi & Figli. Milano.

This map gives statistics with reference to the amount of land under cultivation, means of communication, products, ports, and population, the routes of many travellers are also laid down. There are three inset maps, two of which exhibit portions of the larger map (Marsa-Tobruck and Cirenaica) on an enlarged scale, while the third is a road map on a reduced scale. The map is very clear, and well executed.

AMERICA.

Argentina, Mapa Geográfico de la República——, compilado sobre la base de los datos mas recientes. Scale 1:6,000,000 or 82·1 geographical miles to an inch. Stillér & Laass, Buenos Aires, 1883.

: This map (which has been compiled by the Chief of the Argentine National Statistical Bureau, for the information of intending immigrants from Europe to the Argentine Republic) can be obtained on application to the Secretary of the Argentine Legation, or from any of the Consuls of the Republic. The map is drawn in a style which gives at a glance the chief physical features of the country, the land under cultivation and that used for pastoral purposes, the railways in operation, those under construction and projected. The agricultural colonies, telegraph lines, international and interprovincial boundaries. There are three inset maps, one showing the Agricultural Colony of Santa-Fé, another the proportion of territory belonging to the Argentine Republic, as compared with that claimed by other South American States; and a third giving a plan of the City of Buenos Aires. The utility of this map is very much increased by the full statistics which are printed (in English) on the back of it; these include extracts from the laws of immigration, enacted by the Argentine Republic, a general description of the country, its industries, wages paid, money, weights, and measures, and indeed information on every subject of importance to persons intending to emigrate to the Argentine Republic. The general map has isothermal lines laid down on it, so that the mean annual temperature of any place is known, the temperatures being given in Centigrade scale.

Colombia, F. v. Schenk's Reisen in——, Blatt III.: Routen von Manizales nach Cartago und Ibagué. Scale 1:450,000 or 6·2 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1883, Taf. 13. Justus Perthes, Gotha. (*Dulau*.)

Sinaloa in Mexiko, Der Staat——. Nach eigenen Aufnahmen und Rekognoscirungen von Friedrich G. Weidner, Topograph und Minen-Ingenieur. Scale 1:1,500,000 or 20·4 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1884, Tafel 1. Justus Perthes, Gotha. (*Dulau*.)

AUSTRALASIA.

Auckland (New Zealand), Provincial District of——. Sheet No. 3. Scale 1:250,000 or 3·4 geographical miles to an inch. Drawn by C. R. Pollen, Auckland. Photolithographed at the General Survey Office, Wellington, N.Z., August 1883.

Fiji Group, Map of part of the—, including the islands Viti Levu and Ovalau. Scale 1:190,000 or 2·7 geographical miles to an inch. Compiled and drawn by James Wyld, London. Price, in sheet 12s., in case 16s., on rollers 21s.

Tasmania, Map of—. Scale 1:316,800 or 4·8 geographical miles to an inch. Compiled and drawn from the most recent information by authority of the Hon. N. J. Brown, Minister of Lands and Works, under the superintendence of C. P. Sprent, Deputy Commissioner of Crown Lands, and Albert Reid, Chief Draughtsman. By Leventhorpe Hall. Hobart Town.

This is a new edition of the Map of Tasmania which was published in 1859. The corrections are both numerous and important; it is drawn in a much less finished style than the older map, and the lines of soundings which were then given, are now omitted. The map, indeed, has been entirely re-drawn and produced by a much cheaper process than that of 1859. Some of the most important corrections are as follows:—In the N.E. sheet, the old map shows a mountain of considerable size and elevation at the north-west extremity of Flinders Island, south of Mount Killiecrankie, this does not appear in the present edition, and is a marked instance of the omissions and corrections, which frequently occur. Again, in Dorset county, the names of Anderson's and Noland bays are given in the new map, and, indeed; the whole of the topography differs widely from that given in the older edition, many names of places, mountain ranges, and courses of rivers appear on this map for the first time or with important corrections. In the N.W. sheet, the courses of the Arthur and Hellyer rivers are altered, especially the latter, which, indeed, bears no resemblance to that formerly given, and (as in the N.E. sheet) the hill-shading in the new map indicates plains in places where mountains were previously shown. In the S.W. sheet, the topography and courses of rivers are extensively corrected; these alterations are very noticeable in the Gordon river, and the shape of Bathurst Harbour. The same remarks apply generally to the S.E. sheet. The impression given by this new map is, that the hills on the former edition were greatly exaggerated.

MISCELLANEOUS.

Cylinder Axis Sundial.—Mr. A. J. Loftus, in presenting one of these instruments to this Society, states that the principle on which it is constructed was suggested to his mind quite unexpectedly, on an occasion when (during a visit to the eastern shores of the Gulf of Siam), his watch having stopped, he was forced to seek for some other method of marking the time. The following is the description which Mr. Loftus gives of these instruments:—

“By the interception of a ray of light into a semi-darkened cylinder, the time of day may be found with great accuracy.

“The form of this dial is contra-distinct to those which cast shadows, and is based on the principle, that a ray of light travelling through space divides the earth into hemispheres in the direction of its polar axis.”

Mr. Loftus contends that this instrument can be used by any child who can tell the time by a clock, and very probably, in its most simple form, and when in proper position, this may be the case; but as the more finished instruments are mounted in very much the same manner as the transit theodolite, with certain modifications, it would be necessary before getting anything like correct apparent time, that the instrument should be placed not only exactly in the meridian, but also adjusted to the polar axis, in precisely the same manner as an equatorial telescope, without the advantage of being able to complete this adjustment by stars east and west; and as it is mounted on a tripod, with the evident intention of its being used as a portable instrument, these adjustments would have to be made every time it was moved.

It seems very doubtful whether the older method of finding apparent time by an altitude of a heavenly body would not be more simple, and certainly, to an

experienced hand more accurate and expeditious. The principle of indicating the hour on the dial by a ray of light is by no means new, it is indeed one of the oldest forms of sundial and that which is also commonly found in the public gardens of Continental cities.

Doubtless a sundial constructed on Mr. Loftus's plan, and which read with a vernier, would, in experienced hands, give closer results than the less finished instruments of the same class, but it would require a person very skilful in adjusting it to get anything like accurate time. Mr. Loftus mentions one of 4 feet diameter, made at Canton, belonging to the King of Siam, which gives apparent time within fifteen seconds, and another made by a scientific instrument maker in London, which on trial gave apparent time to 1.5 second; but the instrument presented to the Society, and which it is to be supposed is only intended to illustrate the principle of construction, could not certainly (even when in accurate adjustment) be trusted to show apparent time much within five minutes of truth.

ATLASES.

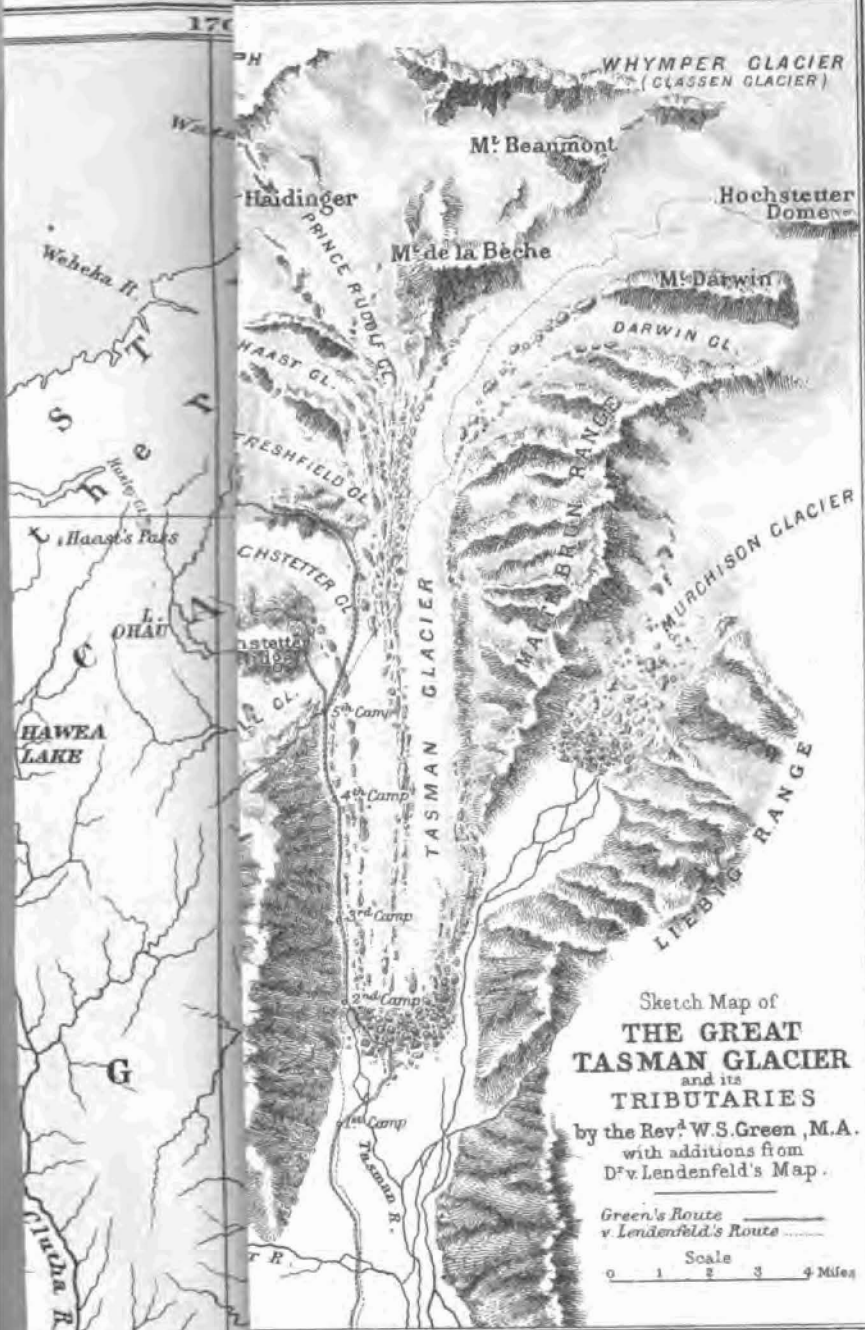
British Isles, New Large-scale Quarto Atlas of the—, from the New Ordnance and Special Surveys, with an Alphabetical Index to 50,000 Towns, Villages, &c. London, G. W. Bacon, 1884. Price, full coloured, in cloth, 1*l.* 15*s.*; half morocco, on guards, 2*l.* 10*s.*; in best morocco, 3*l.* 15*s.*

This Atlas, containing as it does a series of reductions from the Ordnance Survey, is a very valuable addition to the already published atlases of the United Kingdom; the more so as it is complete in itself, is on a larger scale than any similar atlas, and displays evident care in its production. The arrangement of the atlas is particularly good: it commences with an Historical, Geographical, and Geological description of the British Isles; this is followed by comparative tables of the populations of 1000 principal towns, and statistics as to their industries, then comes an alphabetical index of 50,000 villages and towns, with their populations from the census of 1881; this index is so arranged that no difficulty could be experienced in finding any place on the maps if due attention is paid to the "explanation," and if reference is made to the index maps which precede the county maps, a good feature in these latter being their uniform divisions into five-mile squares. At the end of the atlas a large plan of London on four double sheets is given, and twenty very good plans on useful scales of the principal towns of Great Britain, as well as maps of the environs of London, Liverpool, Manchester, Leeds, Glasgow, Edinburgh, Dublin, and Belfast. Special care seems to have been taken throughout the atlas in laying down railways accurately, and in this respect must be very useful; indeed, for the purposes of general reference the whole atlas is extremely well arranged.

Oesterreich-Ungarn, Physikalisch-Statistischer Hand-Atlas von—, in 24 Karten mit erläuterndem Text, unter Mitwirkung von Vincenz v. Haardt, Prof. Dr. Anton Kerner Ritter v. Marilaun, Franz Ritter v. Le Monnier, General-Major Carl Sonklar v. Innstätten, Prof. Dr. Franz Toula, herausgegeben von Dr. Josef Chavanne und ausgeführt in Edward Hölzel's Geographischem Institute.

IV. Lieferung, containing the following maps:—Nr. 13, Waldkarte; Nr. 16, Karte der Vertheilung der Confessionen; Nr. 20, Karte der Vertheilung der Orte. Price 7*s.* (*Dulau.*)

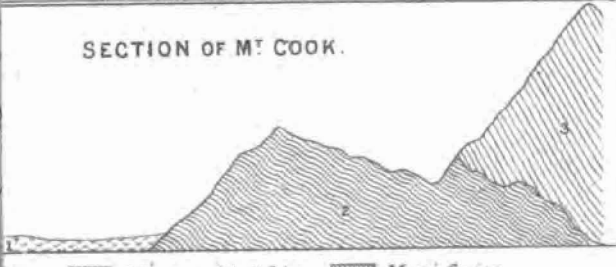
. Mr. McNair's map of Kafiristan, which should have been issued with this number in accordance with the announcement at p. 1, January number, has been withdrawn by the author. We hope, however, to be able to publish it before the conclusion of the present volume.



Sketch Map of
**THE GREAT
 TASMAN GLACIER**
 and its
TRIBUTARIES
 by the Rev.^d W.S. Green, M.A.
 with additions from
 Dr. v. Lendenfeld's Map.

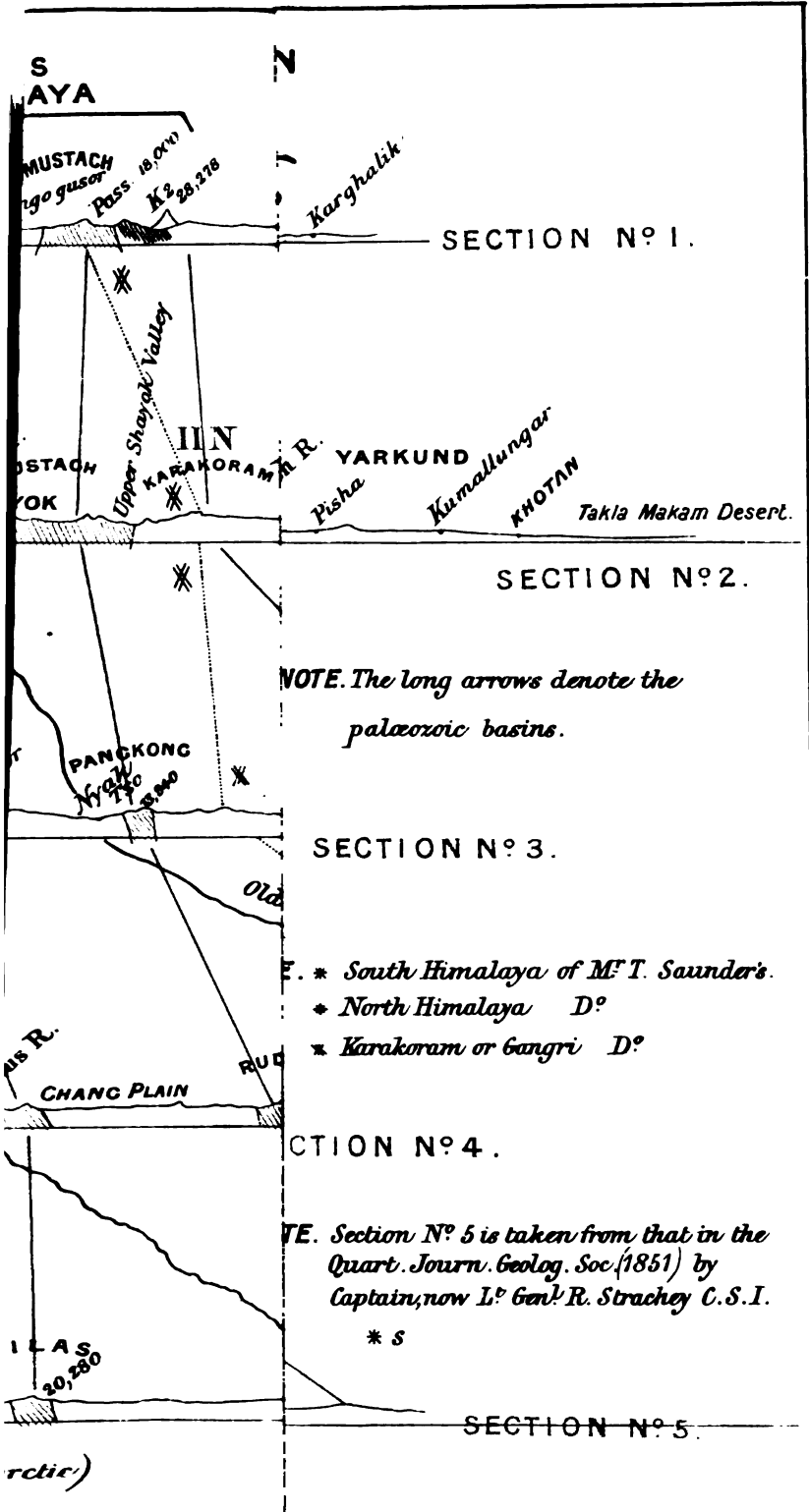
Green's Route ———
 v. Lendenfeld's Route - - - - -
 Scale
 0 1 2 3 4 Miles

SECTION OF M^t COOK.



1. Metamorphic Schist. 2. Matai Series.





SECTION N° 1.

SECTION N° 2.

NOTE. The long arrows denote the palaeozoic basins.

SECTION N° 3.

- * South Himalaya of M^r T. Saunder's.
- + North Himalaya D°
- x Karakoram or Gangri D°

SECTION N° 4.

NOTE. Section N° 5 is taken from that in the Quart. Journ. Geolog. Soc. (1851) by Captain, now Lt Gen^l R. Strachey C.S.I.

* S

SECTION N° 5.

CROSS THE



PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

Three Months' Exploration in the Tenimber Islands, or Timor Laut.

By H. O. FORBES.

(Read at the Evening Meeting, January 28th, 1884.)

Map, p. 176.

IN the year 1878, when I left England for the Eastern Archipelago, I had two main objects in view—one was the exploration of the interior of the large island of Celebes, and the other to visit and determine with some certainty the distribution of animal and vegetable life on the then quite unknown group of the Timor Laut Islands, and to obtain some knowledge of their inhabitants. To assist me in my observations in the former island, the Council of this Society—to whom I desire to express my great indebtedness—liberally granted me a loan of instruments, which proved of great use during my journeys in other parts of the Archipelago; for on account of the authorities in Batavia being reluctant to grant me permission to penetrate into the countries under independent rule in the interior of Celebes, where they were unable to guarantee my safety, I had with much regret to forego this part of my programme. The difficulties in the way of reaching my other goal—Timor Laut—seemed at first also insuperable. I could obtain, on my arrival in Batavia, no certain information about the islands or their capabilities; no passenger vessels visited the group, and such others as did go there were either private vessels or native prahus making voyages at uncertain intervals. The inhabitants of the islands had, too, about the worst reputation of any in the Archipelago, and their cruel treatment of the crew of a steamer wrecked about that time near Oliliet being the common topic of conversation, no one could be found willing to accompany me, nor could I obtain a vessel suitable or accordant to my means which I could hire for my exclusive use. It was the steadfast belief of every one whom I consulted that I should never return alive, if I succeeded in landing among these people. His Excellency the Governor-General himself wrote to warn me of the hostile character of the inhabitants, adding that though the exploration of these islands was most

desirable, the Netherlands Indian Government could not protect me against the dangers to be incurred. He, however, with that liberality and condescension which invariably marks the treatment of scientific travellers in the Dutch territories, placed at my disposal the voyages of the gunboats of the Government marine, and gave me letters of the most favourable description to the officials in that region. As no opportunity then presented itself of reaching my destination I undertook a voyage to the outlying Keeling Islands, a short account of which has already appeared in the 'Proceedings' of the Society.

Permit me to digress for a moment to point out the extreme suitability of the Keeling Islands as a meteorological and zoological station. The proprietor, Mr. Ross, who has a large coco-nut plantation, resides constantly there, employing several hundred coolies, and has the warmest possible interest in scientific pursuits. I can speak with certainty that he would cordially welcome any scientific station on the island. Its cost would be almost nominal, for Mr. Ross, himself a most skilful Glasgow-taught mechanic, has under him a number of well-trained workers in wood and iron, besides some of the best boatmen and divers I have seen, who could furnish at once a most commodious, comfortable, and suitable house as an observatory. Constant communication is kept up with Batavia, and thus with Europe. With a well-equipped station there, in a spot so isolated in the sea, we might expect enormous additions to our knowledge of the growth of coral islands, of the meteorology of the ocean, as well as of the life-history of the inhabitants of the lake-like lagoon and of the surrounding sea.

On my return from the Keelings I made a visit to the west and south-east of Java, and thence crossed over to Sumatra, where I made a long sojourn, keeping all the time my longing eyes towards that little island group on the west of New Guinea. While in this expectant state, news reached me that the Council of the British Association had placed at my disposal, through the kind influence of Sir Joseph Hooker and Dr. P. L. Sclater, a grant to assist in the exploration of Timor Laut. I decided, therefore, to proceed to the eastward, and by hook or by crook attempt to reach my desired destination. Accordingly, on the 15th of April, 1882, accompanied by my wife, I left Batavia for Amboyna, the chief town of the Moluccas, and the official headquarters of the government of the district in which the Tenimber Islands are situated. From Amboyna we hoped to be able to reach Timor Laut by the Government marine gunboat *Tagal* lying there, but as Mr. Riedel (the Resident) had only just returned thence on board it a few days before our arrival, another voyage would not be made for some time. He had just been placing in the islets of Larat and Serah, what are called by the Dutch Postholders, who are as a rule natives of some intelligence sent to new stations without any very responsible duties, to pave the way for European magistrates. No means of trans-

port could be obtained in Amboyna, and to our disappointment we were doomed to a long delay. Part of the time was employed in frequenting the Arab and Chinese bazaars for all possible scraps of information about Timor Laut, but I found very little, as no trade seemed to be done with it. All our barter articles, therefore, on which the success of our journey much depended, had to be chosen mostly at hap-hazard.

The Netherlands Steamboat Company had just about this time begun to run a line of steamers to New Guinea, calling at two of the villages of the Tenimber group. On the 4th of July one of these vessels arrived at Amboyna bound thither, and at last we found ourselves really on our way. After touching for a few hours at Saparuwa, one of the Ceram group, and spending a couple of days at the famous nutmeg gardens of the world, Banda, we called for a day at Gessir, a mere horseshoe-shaped, sandy, coco-nut-fringed speck showing its surface above the water at the east end of Ceram. Once one of the most dreaded nests of pirates in these seas, who found a secure hiding place in its atoll-harbour, it is now one of the busiest and most curious marts in the Extreme East, crowded with representatives of every race in the Archipelago; it is the rendezvous of the paradise and other bird-skin collectors from the mainland of New Guinea, from Salwatty, Mysorie, and Halmaheira, and of the pearl-divers of Aru; whither the tripang, tortoise-shell, beeswax, dammar, and other rich produce from a multitude of islands is brought to be exchanged for the scarlet, blue, and white cottons and calicos of the Dutch and English looms; for the rubbishy yellow-handled knives which form the universal small change of these regions; for old keys, scraps of iron, and worthless but gaudy brummagem. At certain seasons it is quite a rich zoological garden. Here may often be seen birds of paradise of species never yet seen alive anywhere else out of their own lands, parrots, lories, cockatoos, crowned pigeons, cassowaries, tree kangaroos, and other animals which have managed to survive a journey thus far, but rarely farther, west. Thence we proceeded to McCluer Inlet in New Guinea, and waking up on the 8th of June, we found ourselves gazing for the first time on the wooded shores of the land over which there lies such a halo of romance and mystery. Its darkness, however, let us hope, is shortly about to rise, and the light of discovery, we trust, may before another year have disclosed some of the wonderful secrets that have lain hidden for so long in its peaks and valleys. It was with the intensest interest that we landed by scrambling up on the curious and shaky platforms which the Papuan projects far out into the sea as a foundation for his house, over which, on narrow planks of split bamboo and on rolling tree-trunks, guarding against falling into the sea through the constant vacuities, we made our way to the shore, which was but a narrow strip of land a few yards wide in front of high and perpendicular cliffs of rock.

We were surrounded at once by a crowd of tall, erect, frizzly-headed, well-disposed men and women, who found us most curious objects, apparently. It was evident that they had but seldom seen white faces, for our colour interested them very much. They examined our legs, arms, and faces, rubbing them gently and looking at their fingers as if to see whether the colour came off or not; others taking off the scanty headcloth they wore, took our hands within its folds in a most reverential attitude. My wife, probably the only white lady that had ever trod this northern part, was, however, the object of curiosity. After looking at her very intently for some time and at her prematurely grey hair, a thought suddenly seemed to strike two of their number, who dashing away towards one of the houses, returned in a little leading between them an albino woman with fair skin and yellowish hair, and placing her side by side us, burst into a hearty laugh, as much as to say, "We know now why your skins are white." I observed that their dead were buried in the ground, in a mound-shaped grave. One was entirely curtained above and round four stakes driven into the ground; while another was surmounted by a skull.

After touching at Ke and Aru, we bore away south by west, and early on the morning of the 13th of July we sighted the first of the Tenimber Islands; these were the higher lands of Molu and Vordate, beyond which the mainland of the larger islands came into view as a low-lying country trending away southwards, presenting to our eyes, fresh from the majestic forests of the western regions of the Archipelago, by no means a very luxuriant vegetation. When the islands were first discovered and the name Timor Laut or Tenimber first applied, I have not been able to discover. In Mercator's atlas of 1636, they are represented on a small scale, in his map of the East Indian Islands. The first information we possess of a reliable kind is by Captain Owen Stanley, whose name is perpetuated in that magnificent pile of mountains in the south-east promontory of New Guinea, whose summits no white foot has yet trod. In his 'Visits to the Islands in the Arafura Sea,' in 1839 (in Stokes' 'Discoveries in Australia') he says, "We sailed from Port Essington on the 18th March, 1839. . . . Light airs prevented our clearing the harbour till the morning of the 19th, and at 3 p.m. on the 20th we made the land of Timor-laut. . . . At daylight on the 21st we made all sail to the northward . . . and anchored in 11 fathoms, sand and coral, three-quarters of a mile from the shore. On landing, the contrast to the Australian shores [Captain Stanley approached from the opposite point of the compass from myself] we had so recently sailed from was very striking. We left a land covered with the monotonous interminable forest of the eucalyptus or gum-tree, which from the peculiar structure of its leaf affords but little shelter from the tropical sun; shores fringed with impenetrable mangroves. . . . The natives black, the lowest in the scale of civilised life. . . . We landed on a

beach, along which a luxuriant growth of coco-nut trees extended for more than a mile, under the shade of which were sheds neatly constructed of bamboo and thatched with palm-leaves, for the reception of their canoes. To our right a hill rose to a height of 400 feet covered with brilliant and varied vegetation so luxuriant as entirely to conceal the village [Oliliet] built on its summit. The natives who thronged the beach, were of a light tawny colour, mostly fine athletic men with an intelligent expression of countenance." He then gives a short account of the villages near Oliliet, and of the form of their houses, and of his visit to Vordate.

With the exception of this meagre account we have no further information regarding Timor Laut for nearly thirty-eight years, when a vessel belonging to some Banda traders visited the island in 1877, an account of which is given in the Journal of this Society for 1878 (p. 294) under the title of 'Voyages of the steamer *Egeron* in the Indian Archipelago, including the discovery of Egeron Strait in the Tenimber or Timor Laut Islands.' These voyages were undertaken chiefly for trade purposes. The translator writes:—Mr. Hartog says in his report that he has reserved much of the geographical and ethnological information he collected." Up to this time I cannot find that any of it has been published. Mr. Hartog has the honour of being the first person to sail through the strait separating Yamdena from Selaru, which bears the name of his vessel. Captain Owen Stanley was really the first to indicate the existence of this strait; for in his 'Notes of a Cruise in the Eastern Archipelago in 1841-2,' which are to be found in the Journal of this Society for 1842 (vol. xii. p. 263) he writes, "After leaving Baber, we made the island of Sera, on the west coast of Timor-laut, and then stood across for Australia. A good harbour is said to exist in the south part of Timor-laut, which is separated from the north part by a deep channel. Indeed," he continues, "I feel sure that when the island is properly examined, it will be found to consist of several islands separated by narrow channels."

As we drew nearer and nearer, I carefully watched the growing features of our new home. I observed that the much indented coast was fringed in most places with a precipitous bluff, on which principally the villages were situated, whose houses glinted through the vegetation about them, rising behind a low and narrow foreshore, covered with a thick forest of coco-nut trees and dark-green mangrove thickets. At midday we entered the narrow strait between the mainland and the island of Larat, and anchored opposite the village of Ritabel. As soon as we had made fast, several boats put out—the foremost of them rather timidly—from both shores, and in a few minutes we were surrounded by a little fleet, whose occupants scrambled on board, talking and jabbering as only Papuans can, affording us an opportunity of forming some opinion of those who were to be our friends or foes for the next three months. They

were powerful athletic fellows, and conducted themselves exceedingly well, apparently awed by what they saw on board of the marvellous things of civilisation. Their sole request was for *laru* or gin, the most-prized by them of all earthly commodities. After depositing ourselves, our three servants, and the baggage on the shore, the *Amboyna* at once hoisted her anchor and bore away. We sat down on a chest and watched her grow less and less and disappear over the horizon, leaving us with feelings somewhat of desolation and not without some misgivings, the sole Europeans among a race of the very worst reputation and without the possibility of communicating with civilisation for at least three months to come.

We found the native Postholder, a native of one of the Moluccas Islands, left here by the Resident in the beginning of May fairly well housed; but he told us he had suffered terribly from fever. He was good enough to let us a room, and to allow us to store our baggage under the verandah of his house till we should obtain one of our own. We then sauntered out through the village, which is situated on the foreshore against a cliff; the houses resembled those figured in Captain Owen Stanley's narrative already referred to. They were arranged more or less in irregular streets, with their gables mostly to the sea, to allow of their prahus being run up under them, though in many cases separate sheds were erected for their boats. All round the village we found a high strong palisade, removable, however, on the shore side during the day. In attempting to pass out by the gateway we were at once restrained by several of the villagers following us, who pointed to the ground in an excited manner, demonstrating to us its surface everywhere set with sharpened bamboo spikes, except along a narrow footpath. Their gestures were at once intelligible, for they wished to guard us against injury to feet and legs. Our eyes were instantly opened with an unpleasant shock to the truth that the village was standing on its defence. Outside the gate we entered under a coco-nut forest, among ferns, clerodendra, low solanums and malvaceous shrubs, which grew densely over the coral floor of the island, which ended in abrupt cliffs here, and along whose sunny bases I saw several lepidoptera unknown to me and which proved new to science, but not possessing cuirassed limbs which could despise the bayonet crop that overspread the ground, from which in this climate even a slight wound produces often the most serious results, the bulk of them defied the deffest attempts to net them. At sunset, the last man to return to the village had to fill up the pathway and to barricade the gateway for the night; the first goer-out in the morning must open the gate and gather the spikes from the path.

Turning in another direction we ascended the bluff of which I have spoken, on which grew some papilionaceous trees of considerable height,

along with erythrinæ and others I did not know, but in their branches I espied the beautiful scarlet lory (*Eos reticulata*), which, though it had been long known from these islands, I was perhaps the first European to see alive in its own country, and certainly the first to shoot there. During the same walk we were surprised to hear from a coco-nut tree near the village a most singular bawling, or caterwauling, which I thought must proceed from one of the children at play, but which I at last perceived to be produced by a species of oriole (*Mimeta decipiens*), which was later familiar to us as the earliest to rise and the latest to retire of all the birds. These observations raised high hopes in my breast as to what I yet might discover, for I had as yet seen almost no species which was not new. The next sight was less exhilarating: from a branch of another high tree before us, there dangled in the breeze a human arm, hacked out by the shoulder-blade, and at no great distance further were recently gibbeted heads and limbs. These grim mementoes did not inspire either of us with the most pleasant reflections, but we determined to close our eyes on all but the bright side of the picture of which we had got a glimpse.

The villagers seemed perfectly well disposed towards us, without fear or suspicion of us. We ventured to look into their houses as we returned from our survey, and they invited us in with a smile. These are little more than floor and roof, elevated four or five feet above the ground, and entered by a stair through a trap-door out in the floor, which is shut down at night. In front of the door is a seat of honour—*dodokan*—with ornamented supports and a high carved back, on the top of which is placed an image, with, at its side, a platter on which a little food is placed every time they eat. When they drink they dip their finger and thumb in the fluid and flick a few drops upward with some words of invocation. On each of the four sides a space for sleeping is raised some nine to twelve inches above the level of the *rahanralan* or floor of the house. The inmates sleep on small, neatly made bamboo mats, and rest their heads on a piece of squared bamboo, with rounded edges, exactly similar to the Chinese pillow. In one gable is the *foean* or fire-place, and opposite to it on a trellis-work platform is placed the cranium of the father of the head of the house. Indian corn and other comestibles and various articles are stored on little platforms stretching between the rafters, and their scanty clothing is suspended from the roof by elegantly designed and carved wooden devices. Almost everything they use is elaborately engraved, with a skill which it surprised us to find among a people who are so little elevated above the savage state.

Our first care was to obtain a house, and at once on our first morning I set about selecting a site. Those who know best what savage ways are will understand our vexation at the difficulties now thrown in our

way, the excuses for refusing one spot after another, the whole-day palavers abandoned at night without result, and day after day for eight days. That a traveller's good temper takes leave of him ought not to be a matter of surprise. By a large present all round I had the satisfaction of at last cajoling the old men into deciding on a site, which forthwith was occupied before they could change their minds. During the progress of the building, and when my actual presence and help were not necessary, we made short excursions to the immediate neighbourhood, on which we were always accompanied by some of the natives, who seemed to take the liveliest possible interest in our doings. Perceiving that I recorded their names for everything we encountered, they themselves adopted the rôle of teacher—the young women not less than the men—repeating to us the name of every tangible object, as well as trying to bring us to a comprehension of their expressions for abstract ideas. After some days they began regularly to examine us in past lessons, bringing us various objects whose names they had already given us, and by signs requiring us to repeat to them the words for them. When we made a failure or a mispronunciation they would often laugh heartily at us. The buttons on our garments formed excellent objects on which to teach us numeration, and many a score of times we have had to stand while some Venus-formed maiden encountering us in the village insisted on hearing us recount their tale again. So assiduous and apparently interested in our acquiring their language were they, that their willing lessons are to us now one of the most pleasing reminiscences of these simple people. We, of course, very soon began to be able to hold some sort of converse with them.

Among the first facts I learned was that the name Timor Laut was quite unknown to them. This is a Malay appellation, and I have no doubt it was originated by the Macassar traders, who falling on a large island farther in the sea than the one they best knew as the Easterly isle—which the name *Timor* signifies—designated this by *Timor Laut* or the *Eastern Island in the Sea*. I could not discover that they gave any general name to the whole group; but they invariably designated the mainland of the northern of the two larger islands by the name Yamdena, while they spoke of the southern portion as Selaru, which, in their language, is the word for Indian corn. We soon found also that a great deal of the barter goods we had brought were of little use among these people. Only our German knives, cloths, and calico would be tradeable. Our beads they would not look at, they were too coarse and large; their taste lay in small scarlet and blue ones. I had brought a good many English sovereigns; they looked at them narrowly and weighed them, but would not trade in them. This I considered very strange, inasmuch as their most valued possessions were gold earrings. The explanation, however, I discovered later. The *Egeron's* master, it seems, had brought a quantity of false English gold made in

Singapore, using them as barter articles with the people on his first voyages, and some of which they showed me. When they came to beat out the coins the deception was at once discovered, and last year it was impossible to pass a single gold piece. Had the natives the certainty that these coins were genuine, they would give many times their value in exchange, and being easily transported they would form the traveller's most valuable trade medium. We learned, too, what caused us considerable anxiety, that the islands produced practically no rice; nor was sago, as used on the other islands, to be had unless we could manufacture it ourselves from the trees. The products of the island from which the natives mainly obtained their food-supply were Indian corn, sweet potatoes, and a few species of legume, which was all we should have to fall back on should our own not very ample supplies run short.

Many trying and vexatious delays—the laziness of the natives, quarrels in the village, and fear of attacks from our neighbours, which are easier to look back on from the midst of civilisation than to bear with equanimity at the time—prevented our house, which taxed all our energies, from being finished till the nineteenth day after our arrival, and not till then was I able to commence making any close study of the surrounding country, or of its flora and fauna. I soon found that we were terribly hedged in by enemies, and that my work would be much circumscribed. A certain bond of amity existed between the villages of Waitidal (on the north-western corner of Larat) and Ritabel; but a deadly feud was in existence between them and Kaleobar, one of the largest villages on the island, situated on the north-eastern corner, which was leagued with Lamdesar, another large village on the south-eastern coast. Frequent raids had been made recently by these villages on Ritabel (our village), the wife of whose chief had recently been picked off from the outside of the palisade by a lurking Kaleobar marksman, while many of the villagers could show me new wounds received in an attack made a few weeks before our arrival. In this affray it was that the unfortunates whose dismembered limbs had so conspicuously met us, were captured. The villagers being in constant dread of attack, dared not go any distance from their homes. I had therefore no one to act as guide. Compass in hand, trusting to my white colour and my gun, I penetrated into the interior of the island, as far towards the hostile boundaries as I considered prudent. I was struck with the fact that everywhere the island was composed of coral, and that the vegetation grew on the scantiest possible soil.

No rock of a sedimentary or granitoid character could I detect anywhere on the islet of Larat. I had at first thought that a stratified like mass near our residence had that character, but on showing a specimen to Professor Etheridge, he said it was entirely without any arenaceous composition. The lowness also of the country in our immediate neighbour-

hood struck me much. I could see on Larat and on the mainland, no ground rising over a couple of hundred feet or so, for standing on the shore I could look right across the main island, and see the greater portion of the only height worthy of the name of mountain, within the range of vision, the Peak of Laibobar. This mountain, symmetrically conical in form, rises out of the sea on an islet on the west coast, and is, judging by the eye, somewhere about 2000 feet in height. I have little doubt that it will be found to be an extinct or dormant crater. I was shown by the natives a piece of pumice stone, used by them to polish their spearheads, which they say floats into their bay after northerly and westerly winds. Possibly some of it may be washed into the sea off the slopes of this mountain during the rainy season. Further experience showed me that the whole of the mainland of Yamdena, as far as my excursions extended, was also of coral, which formed precipitous cliffs nearly all round the islands, in some places as much as 60 to 80 feet in height; but about Egeron Strait the coast is said to rise about 400 feet. The soil is very thin, only reaching a few inches. In some places the low shrubby forest is almost impenetrable on account of its spiny character, while in others almost none exists. The trees are, some of them, of considerable height, but of no great thickness and sparsely distributed. The largest are fig-trees of the genus *Urostigma*, and *sterculias*. As the latter are common and throw out their flowers in advance of their foliage, their crowns form enormous bright scarlet bosses and are the most striking objects in the landscape. Doubtless they are common along the coast, and probably suggested the term "brilliant" used by Captain Stanley in his description already quoted, of the vegetation about Oliliet. The *sterculiaceous* tree may probably come near to, if it is not identical with the fire-tree of Australia, spoken of by Sir Joseph Hooker in his 'Flora of Australia.' Leguminose trees also abound as well as myrtles, a species of pandan, and a few palms. Under these a green carpet of *Commelyna* hides the rough and knobbly coral. *Casuarinas*, which abound both in Timor and Aru, and phyllode-bearing acacias, *Eucalyptus* and *Melaleuca* were singularly conspicuous by their absence. *Artocarpus incisa*, not the true bread-fruit, which is a seedless variety, but the species so common in the Moluccas, occurred in considerable abundance. The whole group is about 120 miles in length; but none of the many islands of which it is composed seem capable of becoming commercially important.

The island of Larat is separated by a narrow strait from the mainland, and forms a fairly good harbour at its northern entrance, but shallows away towards the southern one so much that only small boats can come through it at low tide. In fact to the south of Ritabel village the bottom can be reached all the way across, with the exception of a few yards, by a poling stick. Large steamers, like those of the Netherlands India Steamboat Company, are easily able to anchor opposite

Ritabel village. As this channel is not designated by any name in our maps, I have associated it with the name of Mr. Wallace. The district across this inlet facing Ritabel is called Lutur by the natives, and has generally been entered in maps as an island. The passage which separated it from the mainland was only a few yards wide, and has now become so nearly obliterated that it is in great part dry at low tide, and even at high tide the native prahus cannot pass, so I have represented it as really part of Yamdena, though it was doubtless at one time separated by one of those singular channels of which Captain Stanley speaks. Between Larat and Vordate there is in calm weather a safe channel, yet on the same officer's authority it is quite shoal. The sea to the northward, again, is very shallow, only narrow passages separating the islands of Frienu, Maru, and Molu, as I gather from my hunters (who are to be trusted) whom I sent there for a few weeks to collect, and gather information.

In comparing the Aru group with the islands under consideration, one is struck with the resemblance that exists between them in the curious way in which both are cut up by narrow channels. "Some of the southern islands of Aru [I quote from the narrative of the voyage of the Dutch corvette *Triton* in 1828] are of considerable extent, but those to the north, lying close to the edge of the bank, are rarely more than five or six miles in circumference. The land is low, being only a few feet above the level of the sea except in spots where patches of rock rise to the height of 20 feet, but the lofty trees which cover the face of the country give it the appearance of being much more elevated."

As there exist no rocks and no mountains, it will not be surprising to learn that there are no rivers and no streams. All our so-called fresh water was skimmed off the surface of holes made in the coral, and was brackish and unpalatable. On the mainland, however, I noticed at one point slightly above high-water mark fresher water than that found in Larat, flowing, it seemed, from a spring.

The constant dread of an attack by the Kaleobar tribe on our village, by keeping us in a state of suspense and anxiety, restricted my operations to a narrow area. I therefore proposed to the native Postholder that we should visit that village to try what could be done by personal influence to establish peace. He, however, seemed by no means willing to accompany me, excusing himself on the plea that the people of the next village, which had lost more than our own by Kaleobar raids, would oppose a peace. I therefore determined to sound them first on the subject. Accompanied by the *orangkaya*, or chief from Sera, on the west coast, who happened to be in Ritabel on a visit, and who spoke a little Malay, I proceeded to Waitidal. This, like most of the Tenimberese villages, was situated on a flat space of some extent on the summit of a bluff which stood a good way back from the shore. To reach the gateway we had to ascend the perpendicular face of the cliff by a steep wooden trap stair, of

dark-red wood, whose sides were elaborately sculptured with alligators and lizards, surmounted by a carved head on each side. On entering the village I saluted those near the gate, but we were rather coldly received. As we proceeded up the centre of the village two elderly men, who were evidently intoxicated, rushed at us with poised spears, gesticulating and shouting to those around to fall on us. The tumult brought out the *orangkaya*, whose approach prevented any immediate act of hostility, and to him my guide explained the object of our visit. The chief, accompanied by the older men, conducted us to his house, through the door-hole of which I ascended with the uneasy feeling of entering a trap. My proposals being fully explained to them, they were received at first with little opposition, till my intoxicated friends joined the circle. One was evidently a man of some importance in the village, and at once opposed the project in a hostile spirit, which gradually spread to the others. As no palaver is ever conducted without profuse libations, raw palm-spirit, distilled by themselves, was passed round in coco-nut shell cups, and I was expected to keep pace—no slow one—with their drinking.

As the spirit circulated the hostile feeling developed, especially as the discussion had merged into another, viz. that I should be persuaded to leave Ritabel and dwell in Waitidal; I had sold much cloth and knives in Ritabel, but had brought none over to them; I could have plenty of fowls among them; they would find me no end of birds, and would not cheat me in the way the Ritabel people were doing. To this of course I could not agree, and put my refusal as pleasantly as I could. I tried to bring the palaver to a close by rising to go away; but this they would not permit, for one of them barred my exit by guarding the hatch. I now discovered that the subject of their excited wrangling was whether I should be permitted to leave at all. My guide, after whispering to me not to be alarmed, and adding a remark I did not comprehend, left me, intending, as I imagined, to return soon; but he either joined some other drinking party and forgot to do so, or purposely left me to my own resources. Pretending to be quite pleased to prolong my visit, I presented my cup for more spirit, and as successive rounds were filled my companions became incapable of observing that I did not drain my cup till I had passed its contents through the floor, and was imperceptibly nearing the trap-door. I took the first opportunity of diving through the orifice, and with a bold step shaped a straight course for the stairway at the top of the rock, where I felt I was able to dispute my departure. Twice only in my travels has my heart quailed before what seemed overpowering odds—this was one of them. I did not venture a second time amongst them, although the villagers themselves came over to our village in twos or threes to dispose of fowls and ethnological objects that they might thus share in the cloths and other goods I had brought.

The Postholder, thus backed by the action of the Waitidal people, would not venture to Kaleobar, and I did not consider it prudent to go alone. We had therefore to bear with equanimity what could not be remedied; but it was galling to be in a new and unknown country and be tied to a few acres of it, without being able to cross the mainland to the west coast, or penetrate farther south from want of guides, and especially carriers. The Papuan, strangely enough, seems incapable of being trained to carry, except for a short distance. From various sources, however, I learned that contrary to the statement made in volume *Australasia* of Stanford's 'Compendium,' that there exists a "black frizzly headed savage people living in the interior," there are absolutely no inhabitants in the interior of Timor Laut. Only along the coasts are there any villages; on the most northern portion there do not appear to be any at all. It was some consolation that the immediately surrounding country was not exhausted, for up to the last rare or new species were every day being found by us; not the least interesting among the plants being a fine orchid, growing on the bare coral rock, within the tide-wash even. I was able to add to my observations on the people of our village who, on the whole, behaved toward us remarkably well.

The natives of the surrounding villages were handsome-featured fellows, tall, erect, and with splendidly formed bodies, with their long hair carefully combed out, girt with black, red, and white patchwork calico bands round the forehead and occiput, the hair being transfixed with a long skewer-like comb, and then hanging down to the shoulders. It is dyed, by a preparation made of coco-nut ash and lime, of a rich golden colour, varying, however, according to the time between the application of the dye, from a dirty grey through a red or russet colour to the approved shade. Very few show true frizzled hair, and it is different from the hair seen on the Papuans of McCluer Inlet, in New Guinea, or among the Aru islanders.

The men vary very greatly in stature: some are short and thick-set, and reach little over 5 feet, if they even attain that height; the greater proportion are tall, well-formed men of about 5 feet 11 inches, but some stand well over 6 feet, splendid looking fellows with perfect frames and magnificent muscles. The women vary in like degree, some being short and thick, scarcely reaching 5 feet, while others are as tall as the taller of the men. In their walk they stride forward in a jerky, bouncing style, which gives to the head a sharp nodding motion, their hair, when combed out behind, heaving up and down. Their whole motion is full of grace, but so proportioned are they that it really seems scarcely possible for them to move ungracefully. As children many of them are really pretty in face and figure; numbers are frequently disfigured by enormously distended stomachs and abdomen, which induces a sad expression of countenance and a sickly face. The youths are splendid

examples of the human form ; many of the girls are handsome, and a few are even beauties, with pensive eyes, delicate features, and faultless in contour of body and limb. As they pass into the married state the features become coarser, but on the whole neither sex can be called ugly.

The colour of the Timor Laut man is a rich chocolate brown ; but here and there among them occurs a quite black-skinned individual, who is at once remarkable as being an exception to the prevailing colour. The texture of the skin is by no means coarse ; often rather smooth and soft. In feature the forehead retreats slightly from the prominent superciliary ridges, as seen in profile. *En face* it is somewhat flat. In the malar region, in some the cheek-bones are very prominent ; in others, again, they are as little observable. The brows are low, but not conspicuously hairy. The eyes are small and narrow, and in few a slight obliquity is observable. In a few also the eyeball is very prominent, but in others by no means so. As regards the nose there are two distinct forms : one in which that feature is very low between the eyes, advancing with a straight dorsum to the *retroussé* tip, which discloses both nostrils conspicuously, the tip being markedly pointed. The other form is that in which the dorsum is higher between the eyes, is straight, rarely arched, and the tip pointed, depressed, and incurved to form a thick fat septum. In this form the nostrils are almost concealed, and the *alæ nasi* much inflated. *En face* both dorsa are straight, the first form exhibiting the nostrils fully and the septum ; the second form with the dorsum compressed slightly in the middle, the nostrils not seen save slightly, and the *alæ nasi* inflated. The upper lip is prognathous ; the lower somewhat retreating, or orthognathous. The teeth of the upper jaw overlap those of the lower jaw, but this is not invariable, many of both sexes having the teeth evenly meeting. From the malar region the face rapidly converges to the small, non-protruding, round, and rather well-shaped chin. The ears are small, but a good deal disfigured by the large, irregularly bored and slitted holes made in the lobe, while the helix and scaphoid fossa are put out of shape by a series of smaller holes in which the earrings graduate from above downwards, from small to greater.

I was able to obtain a fair series of crania, which have been kindly examined for me by Dr. Garson, whose paper will shortly be published in the Transactions of the Anthropological Institute. From these, as well as from my own observations, it is evident that in the Tenimber Islands we have a distinctly mixed race, consisting of Malayan and Polynesian elements, as well as of the Papuan as found in New Guinea. By Polynesian I mean the brown race seen in the Fiji and Samoan Islands, as distinguished from the sooty black tribes occurring in Aru and New Guinea. This commingling may be the result of many causes. Timor Laut was probably one of the last islands, as Mr. Keane believes,

occupied by the Polynesian race in Malaysia during its eastward migration to the remote archipelagos of the Pacific, and some members of the family may have been left behind, and these mingling with subsequent arrivals from Papuasias and Malaysia may have thus contributed to the present heterogeneous ethnical relations observed. The Timor Laut tribes have, moreover, been long notorious for their piratical habits, attacking all boats passing near the shores, making slaves of the men, and concubines of the women. In the boats that called at Bitabel on their way home from various parts of the group I have seen being taken back with them women, whom the chain binding them to the mast proclaimed to be slaves, captured or bought. The Buginese and Macassar traders carry on also a large traffic in slaves, bringing them from Halmaheira and the coasts of Borneo and Celebes. In this way also may be accounted for some of the race-mingling.

The climate of Timor Laut was one of extreme insalubrity. For the first eighteen to twenty days none of us suffered in the least; but that period seemed to be with us all the limit of resistance to the deleterious miasma. The fever that then supervened was one of great severity. Coming on with sickness, the temperature rose rapidly to 103–4–8 degrees, accompanied with delirium, which in the case of one of us continued for nearly three weeks with but short intervals of release. During the continuance of the fever the two most effectual remedies were salicilate of soda and chloroform, both of them rapidly lowering the temperature and inducing perspiration. The fact that no fresh water could be got on the island renders it pretty certain that really a great share of the sickness must be attributed to its want. During July, August, and September, we experienced south-east winds, blowing for weeks without cessation; and this wind invariably brought a return of fever if we were exposed to it.

Of the natural history, of which little had been known before our visit, I have been able to add considerably to our stock of knowledge. Animal life, with the exception of birds, is but poorly represented; with the exception of a *cuscus*, a genus common to the Moluccas and New Guinea, and a wild pig, there are no indigenous mammalian animals—with one reservation, on the mainland we found large herds of buffaloes to exist in a wild state, having, as the natives believe, come up out of the earth. When, and by what means they arrived is unknown; but there can be no doubt that they have been brought by accident, such as shipwreck, or by design. They must feed on the *Commelina* I have mentioned, and on the leaves of low shrubs, for no grass is to be found there, and they must often, I feel sure, be pressed for water in the dry season. Snakes and lizards were found in considerable numbers, and I added one of each to science; while out of sixty species of birds I brought no fewer than twenty forms, differing from any previously known; of the butterflies and insects obtained nearly one-half were undescribed before. One

of the objects of my visit was to determine to what zoo-geographical province Timor Laut belonged. Lying as it does at no great distance from Aru and New Guinea on the east, from Australia to the southward, and from Timor to the west, it was an interesting question which of them had behaved most bountifully by it. It is surrounded by a very deep sea, deeper, so the captain of one of the Dutch men-of-war, surveying in that region just before my return to Europe, informed me, than is represented in most of the charts. Looking to the birds peculiar to the group, all belong to Papuan genera (and nearly allied to known Papuan species) with the exception of three or four, which have their nearest representatives in Timor or in Australia. The insects, on the other hand, as collected by me, show a great preponderance of Timor over Aru or New Guinean forms, with a slight Australian tinge. I have pointed out above the conspicuous absence of casuarinas and gum-trees, so characteristic of the neighbouring islands. The presence of snakes and frogs is also of great interest. The flora as represented by my herbarium, which would have been much larger but for an unfortunate fire which consumed the drying-house, has not yet been reported on; but fuller collections, extending over a wider area of the islands, are still required to settle more satisfactorily these interesting distributional questions, and these I hope to be able to make during the present year, by a sojourn on the south part of the north island, or Yamdena, on my way to New Guinea.

On the 20th of September the steamer was due to return, but for some time we had been anxiously counting the days; we had been obliged to fall back on roasted heads of Indian corn, which sorely tried our masticating organs, to eke out our supplies; we could purchase fowls now on rare occasions only, as the articles the natives demanded of us in exchange were all gone—it is a characteristic of the race to *give away* nothing, and to part with their possessions only for what they want at the moment, no matter if something of many times the value be offered them; our stock of febrifuges was exhausted, and above all we were sadly reduced by the pernicious fever which was difficult to combat without luxuries we could not command. Boats from Vordate brought in the news that the threatened Kaleobar attack was really about to be made, tidings which to them seemed confirmed by the simultaneous recognition of the great comet of 1882 in our northern sky. Extra guards were placed who danced, as is their custom on such like occasions, round the village god night and day, with a hideous howling chant accompanied by beating of drums which was equally incessant. On the 28th, when our larder was absolutely empty, the sharp eyes of the natives descried at break of day a thin line of smoke on the horizon, and a few hours later we stood on the steamer's deck looking back on our swarthy companions, and moved away from the village with our little home, with some of the eager hopes with which we had landed amongst them some months before, gratified,

yet feeling how much there was left undone of what we had wished to accomplish; and as the verdure-clad shores faded from our view the recollection of our dangers and anxieties, which had been very real, vanished like an evil dream, while the intense pleasure—whose solidity only a naturalist really knows—of our wanderings amid a strange people, and a perfectly new fauna and flora, was henceforth alone to fill the retrospect of our sojourn among the Tenimber Islands.

Note on the Ascent of Ambrym Volcano in the New Hebrides.

By Lieut. C. W. DE LA POER BERESFORD, R.N.*

(Read at the Evening Meeting, January 28th, 1884.)

COMMANDER W. USBORNE MOORE, of H.M.S. *Dart*, has sent to the Admiralty the following account, written by Lieut. Beresford, of the ascent of the volcano of the island of Ambrym, remarking that it had never previously been visited by any human being:—

We left the ship at 2 P.M. on Sunday the 12th August, in the steam cutter with the gig in tow, our party consisting of Dr. Luther, Mr. Craig and one of his boys, two seamen (Jas. Henning and Jas. Searey), and myself. We stopped some time off Malo Point while Mr. Craig went in for the chief, who had a bad cold, and seemed to want a good deal of pressing before he would come. However, he appeared about four o'clock, and we continued along the coast, surveying it from Malo Point as we passed. We landed at the place from which we were to start at about five o'clock, and decided to take advantage of the cool of the evening to walk on towards the crater as far as we could. A dozen of the natives of the village of Chamassu volunteered to accompany us to the "big fellow fire," all declaring that they had been there before; one of them, called "Tom," spoke the best English I have heard from any of these natives. We walked about a mile through the bush, amidst beautiful banana and yam plantations, and came out in south-east bay: this is a fine large bay with a sandy beach about two miles long, and, Mr. Craig says, good anchorage in about 12 fathoms. I could not, however, see any place where one could land, a heavy surf breaking all along the beach. About the middle of the beach we turned up into a ravine about 300 yards wide, with steep densely wooded sides about 100 feet high; the sides appeared fairly cultivated in parts for at least four miles up the ravine. The ravine itself was evidently formed by an overflow of lava from the crater at the original upheaval of the island, and was floored with fine black sand, which afforded capital walking. The moon was nearly full, and giving enough light through the clouds for us to see our way clearly, so we kept

* Communicated by the Admiralty.

on till about nine o'clock, when we came across some pools of fresh water, which the natives informed us were the last we should meet. I estimated that we had come about seven miles, and had ascended by a very gentle incline about 1000 feet; the ravine had narrowed to about 100 feet in width, and the sides were higher and more precipitous; we had to make frequent detours through the bush to avoid masses of lava which blocked the ravine and were too steep to climb; the vegetation had become sparse, nothing but tree ferns and grass being seen, and these occasionally burnt in large patches.

We had been joined about three miles from the beach by six men from a bush village, who seemed to know the way well, and they assured us that we should find no more water further on. We accordingly lit fires and cooked our dinners, and were just about to discuss it when it came on to rain heavily. The natives suggested that we should go back to a place where there was more shelter, and we very reluctantly retraced our steps about a mile, when we came to an overhanging cliff which formed a sort of natural umbrella, big enough to cover our whole party. We camped there, the doctor, the two seamen, and I keeping four watches through the night and turning out at five A.M. to cook breakfast.

We were under way by six o'clock, and kept the ravine with frequent detours through the bush till 8.30, making about three miles an hour and rising about 200 feet in a mile, when we found ourselves at the foot of a hill about 800 feet high, composed entirely of cinders and small spiculæ which tried the natives' bare feet very much. We expected on arriving at the summit of this to find the crater close under us, and were much disappointed to find that we could see nothing but another hill about 1000 feet above us, on the other side of a deep ravine, about a mile south-east, and another about 2000 feet, with a remarkably rounded summit, about four miles due north of us; everywhere else there stretched range upon range of undulating cinder heaps similar to the one on which we were. Smoke appeared to be issuing from the weather side of both these hills, and that from the nearest one was blowing straight in our faces. Our first idea was that the crater was on this nearest hill. The natives seemed perfectly content with what they had already achieved, and absolutely refused to go further. Tom, when I asked him which was the way up the big hill, said, "You no can go there. Suppose you go more far, you finish, you no come back; Devil he stop along big fellow fire." The doctor said, "All right, I go speak along Devil."

We took our haversacks from them and I started off towards the foot of the big hill. Before I got to the bottom of the ravine I heard the doctor hailing me to keep to the left and meet them by another ravine. When we met I found that most of the natives, apparently ashamed of staying behind when they saw us start, had volunteered the information that I was going wrong. "Big fellow fire he no stop along there." The ravine we came up by was trending to the northward when we left it,

and we thought it might lead us in between the two big hills, where we should probably be able to get round and attack them from the weather side, having no doubt that the crater was on the summit of one of them. The natives told us that the ravine led to Ranon, the village near Rodd's anchorage, where the missionaries are building their house, and from its general direction I should say it probably did.

We kept along this ravine for about six miles, descending about 200 feet below the foot of the first hill we went up, and then came to another ravine running to the eastward, which we found terminated at the foot of the big round-topped hill and to leeward of it. The hill was, like the first one, composed entirely of cinders and small spiculæ, and it was useless attempting to climb it from there, so we went back a short distance and took another ravine running about south-east. After going about a mile along this, we sent Malo's boy, Patrick, to the top of a small hill to see if he could see the crater. He came back and told us that he could not see the crater, but there were a lot of men a little further along the ravine. We closed up together and got our pistols ready and soon met these natives, amongst whom we were surprised to find two of the men who had left us at the top of the first hill (or rather cinder heap) we went up. There were about twelve men in the party, and Tom having explained what was wanted, they trotted off, and in five minutes brought us to the top of a small hill overlooking the main crater.

This crater has probably been long extinct. It is covered with scorïæ and volcanic sand to such a depth that no traces of lava could be seen. It extends about three to four miles north and south. To the southward we observed the large hill we had seen south-east of us when the natives first hesitated; north-east was the high rounded summit, and on the easternmost part of the foot of the latter was a small crater in action. Above us to the westward was a summit which gave us the idea of an extinct crater. The active crater was about two miles distant, and we arrived there about one P.M. The natives would not come near it at first, but gradually gained confidence from seeing we were not getting hurt, and finally, holding very tight by our hands, ventured to come to the edge and look down. It was very evident that none of the natives with us had ever been there before, and probably no human being of any colour. We approached it from the southward, where the ascent is easiest; it appears perfectly accessible from all sides; the diameter is about a quarter of a mile, the most active part being under the northern edge, where at above 800 feet below the lip, there is another small crater, which goes down out of sight, and from which flame and smoke were ascending in considerable volume. Smoke was seen in several other fissures, but nowhere in any large quantity. The northern edge is about 50 feet higher than the southern. From our position on the southern lip of the crater the large rounded summit bore N. 35 W., and was distant about half a mile, being elevated about 1500 feet above us. The summit of

what we supposed to be an extinct crater was S. 81 W., and distant three miles, elevated about 1000 feet, and the summit of the hill we had seen to the south-east, when the natives wanted to turn back, was S. 17 W., distant five miles.

To the eastward of the main crater there were no hills, being the weather side. All the hills seem to be mere cinder heaps; no rocks, small stones, or lava were seen anywhere but in the ravine by which we came up, which was probably caused by the original upheaval of the island. The largest cinder we found was not the size of a walnut. The sides of the small crater were lined with sulphur, but none was seen anywhere else, though the fresh water in the ravine was strongly impregnated with it. The purest tasting water we found was within 200 yards of the lip of the crater, where there was a little stream on the side of the hill.

We started back directly after lunch by a different route from that by which we came up; it took us well to the southward of the island into a ravine similar to the other, except that it ended about a mile after we got into the area of vegetation. It may probably be accounted for in the same way as the other, but having a greater fall was brought up in the valley where it ends. After leaving the ravine we found ourselves in a highly cultivated country, through which we passed by paths along the ridges of the hills to the sea-shore.

Previous to the reading of the above,

The CHAIRMAN (General Sir J. H. Lefroy), said he had now the pleasure of introducing to them the author of the paper about to be read, respecting a part of the Eastern Archipelago that had never before been touched by the foot of an Englishman and by very few Europeans at all. Mr. Forbes seemed to have been born to prove in an experimental manner that

"Stone walls do not a prison make,
Nor bamboo bars a cage."

For though he was debarred by untoward circumstances from doing what he had intended, namely, to make a full exploration of the interesting archipelago called Timor Laut, he nevertheless did accomplish a great deal and had brought home a very interesting account of the people of that little-known group of islands, and still more so, of its very remarkable flora and fauna. Mr. Forbes was accompanied throughout his explorations by a lady who was present at the meeting that evening, and whose devotion to him was but a further exemplification of what they all in their hearts believed and a great many of them were happy enough to know—the unbounded devotion of an English wife to her husband. He would tell them not only of Timor Laut, an island on which no European had ever before resided, but also somewhat of New Guinea, which was at the present time an object of interest to every thinking person with regard to the extension of English sway in the Eastern Archipelago.

After the papers were read,

Sir JOSEPH HOOKER said he could only wish that this discussion were opened by some one better instructed than himself in the geography of that most interesting archipelago of Papua. He would freely confess that when Mr. Forbes first wrote asking for information and assistance towards his adventurous expedition, he was

ignorant of all but the existence of Timor Laut. Of Timor itself he had heard, as he would afterwards show; but he referred to his 'Gazetteer,' and the only information contained there was given in three lines, stating the longitude, the latitude, and the length of Timor Laut, together with the solitary observation, that it was inhabited by a race "notorious for its treachery and its cruelty." He need not say under those circumstances it was with some misgivings that he joined his friend Dr. Sclater in an application to the British Association during its meeting at York for some assistance to be given to Mr. Forbes; and it was due to himself to say that had Mr. Forbes informed him that there was a lady in the case he should have thought twice before making an application. However, "All's well that ends well." A most successful expedition had been made, and they must congratulate Mr. Forbes on the energy and endurance of Mrs. Forbes and himself in this hazardous undertaking. The interest which botanists and zoologists take in Timor Laut is due to the fact that a knowledge of the natural history of Timor itself had profoundly modified the views that had long been held as to the absolute restriction of the flora and fauna of Australia to that continent and to Tasmania. He well remembered the time when his friend the late Professor DeCaisne startled the scientific world of Paris by showing in his 'Flora Timorensis,' that genera, and even species typical of Australia, inhabited Timor. From that time to this, the limits of the Australian flora, so long supposed to have been circumscribed with exactitude, have never been laid down, though it has been enormously enlarged to the north by the inclusion of the great island of Papua, which is to a great extent Australian in its biology, and by that of sundry other islets to the north-east and north-west. It is under this point of view that Mr. Forbes' collections are so important. It is true that for the most part they consist of what are generally known as *coral-island* plants—many of them being the same as those which were found in Keeling Island and on other coralline islands. But besides this there are some peculiar forms, and there were two plants of extraordinary interest which he would simply instance as being typical, one of the New Hebridean and one of the Australian flora. It so happened that these two plants belonged to unispecific genera; there were no other species, and therefore they could not be looked upon as widely distributed plants. The existence of those plants pointed to some old communication between those particular islands. They knew that the Hebrides were to a considerable extent Australian, and here in these islands at the extreme western part of the Australian group, in the Papuan groups, two plants were found, one typical of Australia itself and the other of the far western continental flora. Mr. Forbes' collections had been supplemented by those of a native collector, sent by Mr. Riedel, the Dutch Commissioner of the island, and the two together give a very fair idea of what the flora of the archipelago is. It is that of a coralline group added to by those peculiar forms of the New Hebrides and the Australian continent. The whole has been fully examined lately at Kew, and a list is now in course of preparation to be presented to the Linnæan Society in London. He had nothing further to say except to congratulate Mr. Forbes upon his most successful journey.

Mr. P. L. SCLATER, F.R.S., said it was with great pleasure that he had joined Sir Joseph Hooker in the application to the British Association for some help to Mr. Forbes to undertake an exploration to the Tenimber Islands. He believed Mr. Wallace, when in the Indian Archipelago, had at one time an idea of visiting those islands, but had on account of the extreme difficulty given it up. Mr. Forbes was consequently the first naturalist who had ever set foot upon these islands. Sir Joseph Hooker had given the results of the examination of the botanical specimens brought home by Mr. Forbes; the British Association Committee were kind enough to place in Mr. Sclater's hands the considerable ornithological collection made by the

same gentleman. As Mr. Forbes had already told them, the mammals, the reptiles and batrachians were so few that little could be gained from their examination, but the collection of birds was of considerable extent, embracing several hundred specimens. On examination he found sixty different species represented in the collection and twenty-three were peculiar to those islands, that was to say they had not been found out of that area. Three only had been previously known, so that they were indebted to Mr. Forbes for the discovery of twenty new species of birds. Of the collection of sixty species he might say generally that they were quite Papuan in character as distinguished from Australian. The Papuan sub-region formed a very distinct division from that which embraces the mainland of Australia, and as between Australia and Papua, the forms of Timor Laut certainly belonged to the Papuan sub-region, many of them being such as were also found in the adjoining group of Aru. At the same time there were one or two symptoms of a slight incursion from the west; there were one or two forms also found in Timor and even in India. He should therefore judge from Mr. Forbes's collection that the zoology of the Tenimber Islands was decidedly of a Papuan character, with one or two Australian forms and three or four forms from India. With regard to other points of Mr. Forbes's paper, to which he had listened with very great interest, he was afraid he could say very little. It must be obvious to every one that having only spent three months in that very extensive group of islands Mr. Forbes could have really obtained comparatively very small knowledge of the whole group. They could only hope that if Mr. Forbes and his wife were not able to go again, some other naturalist might before very long follow his footsteps and obtain a more perfect knowledge of this very interesting group of islands.

Mr. FORBES, in answer to questions by Admiral Sir Erasmus Ommanney, said the tide rose eight or ten feet in the part where he had any opportunity of making observations. The natives made very neat boats, but they did not go very far from the coast. The boats were very beautifully made, outriggers, and mostly constructed of the wood of a species of fig-tree.

In answer to a question by Sir Joseph Hooker as to whether the natives made palm wine, Mr. Forbes said they collected the sap from the fruit-stem of the coconut palm, from which on its fermentation, they distilled a harsh and intoxicating spirit named by them *tuak*.

The CHAIRMAN said that Mr. Forbes's interesting paper furnished a remarkable illustration of what could be done without any very extensive journeys in point of distance. It had had the effect, which they in that room should very greatly appreciate, of clothing the mere dry bones of topographical geography with the living interests connected with the various forms of nature that occupied it. Mr. Forbes had shown how this little group, separated by rather deep water from the adjacent continent of Australia and the Papuan Islands, had a flora and fauna in a great degree peculiar to itself, with the singular feature, that whereas nearly all the birds had been derived from the eastwards, nearly all the insects came from the westwards, the one probably being influenced by the prevailing winds to a greater degree than the other. One reflection which might have occurred to many minds besides his own was how habitually we, a civilised people, do grievous wrong and injustice to uncivilised races. Mr. Forbes was told before he went among these people that he would find them a set of bloodthirsty savages with whom his life would not be safe for a week. So far from that, he seemed to have found them apparently rather amiable people, with a degree of liveliness which created a very favourable impression. He was sure that there were many travellers who would be very much charmed at being stopped by a "Venus-like maiden," and catechised in their knowledge of the vocabulary of the language. The fact-

was, that those people left to themselves without their passions being aroused by mutually inflicted sufferings and horrors, were naturally amiable, cheerful, and lively, as the inhabitants of Papua itself had been described, and their own worst faults arose from enmities and wars partly arising among themselves, but very often fomented by injustice and wrong committed by the white men who went among them. Human nature was less degraded and more amenable to civilising and elevating influences than it was commonly supposed to be, but they must be brought to bear by the right hands, and not by the wrong ones, as was unfortunately too often the case. Anyhow Mr. Forbes had shown them what a single traveller could do by great nerve, self-possession, and courage, and also how his strength was increased and his heart no doubt sustained by the devoted lady who accompanied him. It was impossible to give him their thanks for the paper which he had read without associating with those thanks that lady.

With regard to the second paper, and a diagram of Krakatoa exhibited by Mr. Forbes, the Chairman said the more they knew about this strange line of fissure that ran in a north-easterly and south-easterly direction through the Archipelago, the sooner they would get to an understanding of those calamitous explosions which from time to time occurred. And from that point of view the observations made by Mr. Forbes were of extreme interest, that Krakatoa was only a secondary symptom after all, that the real primary symptom was an eruption unobserved and unrecorded, but of which the effects alone had been seen, which must have occurred in the Indian Ocean some hundred of miles to the south-west, and that the vast volume of pumice stone which covered tens of thousands of miles of the ocean did not come from one vent but from a subaqueous eruption in that spot. This was a new fact and did not appear in any of the previous discussions relating to the great eruptions of Krakatoa. It was highly interesting because it at once let them into part of the secret of a vast explosive force, for if a fissure occurred there they must have the generation of a tremendous amount of steam under enormous pressure calculated to find its way through every fissure open to it, and to break out where it found the line of least resistance.

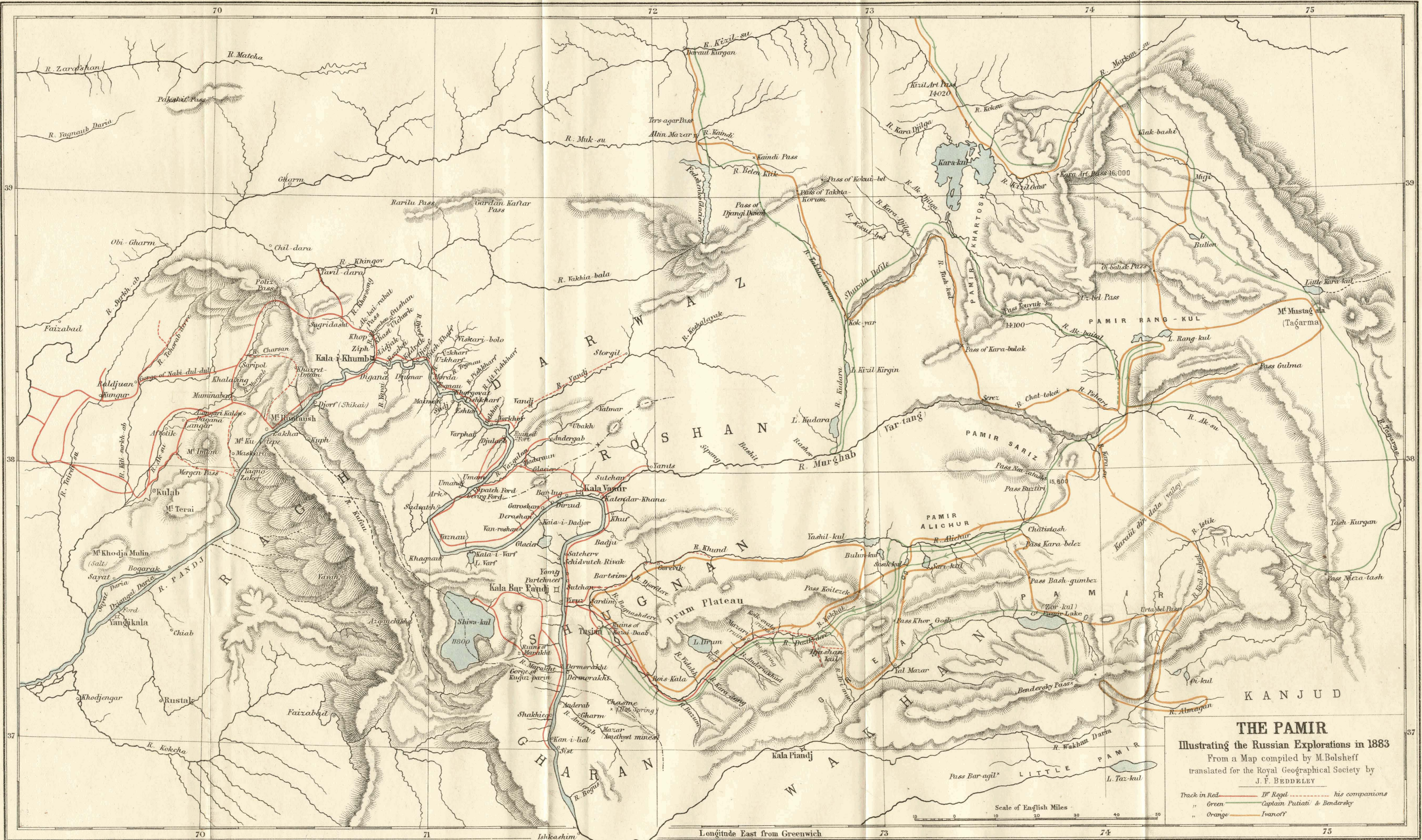
The Russian Pamir Expedition of 1883.

Map, p. 176.

WE present our readers with the following translation of a paper in the *Isvestia* of the Russian Geographical Society,* on the chief results of the Pamir Expedition of 1883:—

The year 1883 will be memorable in the annals of the geographical exploration of the Pamir. The scientific expeditions and travels directed in recent times towards the Pamir from Russia as well as from India, usually embraced but insignificant tracts of country separated by vast districts disconnected and unexplored. What travellers in the Pamir gave us was never more than a very small part of what was expected from them. It was long felt that a larger expedition was wanted—one sufficiently well equipped to solve once for all the mass of problems still

* *Isvestia Imp. Rusk. Geogr. Obshchestva Vvupusk 4.* Our map is a reproduction (translated) of the one which accompanies the paper.



THE PAMIR
 Illustrating the Russian Explorations in 1883
 From a Map compiled by M. Bolsheff
 translated for the Royal Geographical Society by
 J. F. BEDDLEY

Track in Red ——— D^r Regel ——— his companions
 " Green ——— Captain Putiati & Bendersky
 " Orange ——— Ivanoff

Scale of English Miles
 0 10 20 30 40 50

Pub^d for the Proceedings of the Royal Geographical Society 1884.

presented to geographers by the Pamir. Such an expedition—at least so far as concerns the eastern portion of the Pamir—was that fitted out last year (1883) by order of the Governor-General of Turkistan, its members being Captain Putiata, of the General Staff, M. Ivanoff, geologist, and M. Bendersky, topographer. To their energy we owe it that the eastern half of the Pamir has now been traversed in every possible direction, whilst on its southern border, the long wished-for connection has been established between our labours and the route-maps of English travellers.

The first announcement of the successful termination of the labours of this expedition was contained in a letter from Ivanoff to J. V. Mushketof, by whom it was obligingly communicated to the editor of the *Isvestia*. This letter contains only an abstract of the routes followed by the members of the expedition—and that with some omissions; but the bare summary is so suggestive that we felt bound to communicate it at once to our readers without waiting for further information, which would involve a preliminary elaboration of the materials collected.

At the same time that the members of the great Pamir Expedition were making their difficult journeys to the north and east from Pandja, another Russian traveller, Dr. Regel, was continuing his excursions through Darwaz and Shugnan. The sketch-map of his routes, lately received, is extremely interesting, although unfortunately unaccompanied by any explanatory text. It is true that Dr. Regel's maps must be accepted with great caution since he is no surveyor. Nevertheless, admitting even that his sketch requires considerable correction, it is useful if only in that it gives us the first hint of new and unexpected geographical details in places hitherto only visited by pundits—natives from India, who received instructions in surveying in the British Governmental Department of Topography.

Here it will be well to refer to the last of these pundits, known under the initial letters M— S—, who explored Badakhshan and the neighbouring districts from 1878 to 1881. The detailed map of the routes traversed by this explorer we received at the beginning of the current year; it has been published with a brief explanatory text in the Report of the Indian Survey Department for 1881-2. The most important novelty in this map relates to the river Aksu, which is given by the pundit as the upper course, not of the Murghab, as was hitherto thought, but of the Suchan, which falls into the Pandja a little way above Kala-Bar-Pandj.

The result of Dr. Regel's inquiries contradicts this opinion. On his sketch we find that the river Aksu, taking its rise from the lake Suman-Kul, is indeed the upper course of the Murghab. The contradiction between Dr. Regel and all previous Russian travellers on the one hand and the pundit M— S—, who had actually been there, on the other, has now been finally decided by the great Pamir Expedition in favour

of the former. It seems that the Aksu is really the upper course of the Murghab, and that M—— S—— having reached the Sariz-Pamir, mistook the true direction of the ravine through which the Aksu there forces its way.

The work of the great Pamir Expedition, as well as that of Dr. Regel, requires an explanatory map, which is given with this part of the *Investia*, the scale being 30 versts (20 miles) to the inch. The eastern part, containing the region explored by Putiata, Ivanoff, and Bendersky, was necessarily compiled from old data; it includes but a few new names occurring in Ivanoff's letter and a lake discovered by the expedition on the watershed between the Istik, the left confluent of the Aksu, and the great Pamir river. The western part reproduces in general Dr. Regel's map on a reduced scale. We have only ventured to diverge from his indications where inquiries in regard to places visited by other travellers take the place of personal observation. Besides this, we have filled in, in greater detail, the bend of the valley of the Pandj between Kala-i-Khumb and Vandj, taking advantage for this purpose of the survey of Kosiakoff, a scientific topographer, who accompanied Dr. Regel in 1882.

The most interesting points in Dr. Regel's map are undoubtedly the vast bend in the course of the Pandj between Murghab and Vandj, and the lake Shiwa, as represented by him. These two geographical novelties we leave as they are on his map, the responsibility resting with the traveller himself. Where we have departed from Dr. Regel's map we have been guided in the southern portion chiefly by Colonel Mattvieyeff's route-map of his journey in 1878 from Kulab to Faizabad, and in the northern parts of Badakhshan by the work of the pundit M—— S——.

We have by no means, however, made unconditional use of the pundit's map. Not a little doubtful, for instance, is the lower course of the river Doab, or Shiwa, as there shown, along the upper part of which lay the route of the Indian surveyor when going from Ragh to Kala-Bar-Pandj. M—— S—— extends this river—as a suggestion only, it is true—as far as Kala-i-Khumb, which cannot possibly be admitted as correct.

If we turn to the map forwarded by Regel from Kala-i-Khumb in 1881, we find that he there shows a mountain range extending to the south of Darwaz, in a south-easterly direction, with separate peaks attaining a height of 20,000 feet. If we now add to that the fact that Lake Shiwa, according to Regel, lies at an altitude of 11,000 feet, we are irresistibly led to the conclusion that we are here on the western border of the Pamir, and this conclusion is also in conformity with existing orographical knowledge.

This border appears, on the western edge of our map, to form its watershed between the left confluent of the river Khingob and the rivers watering the countries ruled by the Begs of Kulab and Baldjuan;

further to the south-east its position is defined by the southern bank of Lake Shiwa, which evidently lies on the plateau, and finally by the eastern sources of the river Kokcha, i. e. partly by the pass into Ishkashim. Such being the position of this border, the outlet of the river Doab must be sought, not at Kala-i-Khumb, but below that place. On our map we have taken the river Doab for the upper course of the river Kufau, partly on the strength of an article by Mr. Arendarenko, in which, enumerating the rivers of Darwaz, he speaks of the Kufau as the principal left confluent of the Pandj, having a length of 150 versts. In making this alteration we have ventured to differ with Regel, who marks the Kufau only as an insignificant stream on the Pamir plateau.

In conclusion, we will add (1) that the ranges barely indicated in Regel's map retain in ours their undecided character; only some few passes and heights are defined, which one traveller (Ivanoff) points out; (2) the boundaries of Darwaz and Shugnan are likewise taken from Regel; and (3) the appellations *Azgantchikha* and *Yavan*, due to inquiries not made on the spot, are given by us also as open to grave doubt.

We will now proceed to give the contents of Ivanoff's letter:—

* * * * *

Leaving Tashkend 24th May, the expedition completed its equipment in the town of Osh, whence it commenced its labours on the 8th June. The route chosen to the Great Kara-kul was that by the passes of Taldik and Kizil-art, and from the Great Kara-kul eastward by the lofty pass of Kara-art (about 16,000 feet) and down the river of that name almost to its confluence with the Markan. Thence turning sharp to the right by a double pass, the expedition visited the sources of one of the more considerable rivers, the Sarikolagezi, which flows through the wide and lofty valleys of Kiak-bashi and Muji. Here we may consider the expedition as entering the region of the Pamirs (not counting Alai). The visit to this entirely unknown eastern border of the Pamir is especially important in regard to the connection between the orography of Western Kashgaria and that of the Pamir and neighbouring regions.

At Muji, wishing to make the most of its forces and time, the expedition divided: MM. Putiata and Bendersky descending the valley through Bulion-kul, Little Kara-kul, and the valley of Tagharma to Tashkurgan; * and thence by the Pass of Stun and Niezatash down the course of the Aksu to Ak-baital; Ivanoff turning westward by the pass Oi-balisk to Rang-kul, through the basin of which he continued eastward to the Little Kara-kul, connecting the former survey of Rang-kul of Skassi

* At Tashkurgan astronomical observations were made connecting the English and Russian surveys.

with the latest surveys of Bendersky. After examining the gigantic treble peak of Mustag-alá (the Tagharma of Severtsof) with its beautiful range of moving glaciers, Ivanoff, crossing Gulma, reached the Aksu and followed its course to the Ak-baital, where he rejoined his companions.

Visiting Rang-kul a second time, the expedition, after a short delay caused by the arrival of a Chinese detachment, returned by way of the Ak-baital to its junction with the Aksu (Murghab), where it again divided—Putiata going down the Murghab to an impassable defile, thence reaching Alichur by way of Buztiri, and continuing as far as Yashil-kul; from there going due south to the Pass of Koitezek, down the river Toguzbulak (southern source of the Shugnan river Suchan), to within one day's journey of its junction with the Khund (the northern source of the Suchan), and returning to the Eastern Alichur. Ivanoff and Bendersky meantime travelled south-east to the Great and Little Pamirs, with the main object of filling up the large blank occasioned by the utterly unknown regions lying between the middle course of the Aksu, Alichur, and the Great Pamir. From the river Karasu, where it touches the ravine Chokubai leading from the Alichur Niezatash, they turned south-east through the wide waterless valley of Karaül-dindala, and having withstood on July 13th a violent snowstorm, the following day reached by a double pass the left confluent of the Aksu—the Istik or Issik), at the spot where on the English maps it is made to join the Kizil-rabat (the lower course bears the name of Chish-Tiube). Having followed the current of the Istik they turned up the Chish-Tiube, and reaching the part where its many sources join (amongst them the Kizil-rabat and Urta-bel), issued at the lake on the upper Aksu, one day's journey from its source. Thence having journeyed to the source of the Wakhan-Daria, they endeavoured to find the supposed pass of Varram-kotal, leading to the lake Great Pamir, but after several reconnaissances they were obliged to conclude that the mountains separating the Great and Little Pamirs were absolutely inaccessible in this direction.

Having made an excursion up along the river Almagan (rising in Kanjud, and falling into the Wakhan-daria from the left), which must certainly be accounted the beginning of the river Wakhan, Ivanoff turned back to the Urta-bel, whence with his party, turning sharp to the left, he reached the Istik at the point on its upper course where the stream makes an elbow at a right angle,* and spent the night on the watershed dividing this river from the river Great Pamir, the place being full of lakes. Having made considerable corrections in the English survey, which was taken in winter when the ground was covered with snow, and having made sure that the sources both of the

* On the English maps this place is called Shakhtiupe, although no such mound as the name implies can be found.

Istik and the Great Pamir are in the southern mountains, and that in the pass between them there is an independent lake, without any visible out-flow, they went westward to the Great Lake. Having stayed here two days amongst the countless flocks of Argali (*Ovis Ammon*) which roam over all the mountain slopes and valleys of the Great Pamir, Ivanoff continued westward, turned north half a day's journey from the lake, and reached the river Bashgumbez (which flows into the Alichur) by the extremely difficult pass of the same name. Not going quite to the Alichur, the party crossed by the new pass of Karabelez-su to the neighbouring river Utchkol, which they followed to the Alichur at Chatirtash, where they met Putiata and his companions.

From the Alichur the whole expedition, now united, journeyed again to the Great Pamir by the Pass of Khor Gosh, at once the most interesting and most practicable, and the following day reached Yal Mazar (a place visited by the English Expedition under Captain Trotter), the position of which was precisely determined by astronomical observations.

Leaving the Great Pamir, the expedition once more divided: Putiata and Bendersky directed their course across the Great Lake, and by a new, hitherto unknown pass (to the west of the Urta-bel), discovered by the practised eye of Bendersky (and therefore called after him), crossed to the Little Pamir, with the intention of endeavouring thence to penetrate through Bar-agil into Chitral; Ivanoff followed the Great Pamir down to its right confluent, the Mass, up which he went to the river Shakhdere, and then up one of the sources of that stream to Kokbai to the north, not far from the Pass of Koitezek, whence he reached the southern bank of the Yashil-kul, which interesting lake he skirted to its western end, where the river Khund flows out of it. Down this river he passed to its confluence with the Toguzbulak, where stands the uppermost *kishlak* of Shugnan—Sardim. Finding that further progress through Shugnan, just occupied by the Afghans, was impossible, Ivanoff returned by the Toguzbulak to the Alichur, traversing this time a new and interesting route direct to the Sasik-kul, whence, by the right bank of the Alichur through Naizatash (obtaining geological materials of the very greatest importance) to where the Ak-baital falls into the Murghab. Here unfortunately he received information from his colleagues that at that time of year Bar-agil was impassable, and that the political condition of Wakhan had compelled them to renounce further exploration to the south, and return without reaching Pandj. Knowing that the provisions of the other returning party were already exhausted, Ivanoff hastened, according to the programme arranged upon, to visit the village of Serez, on the Murghab, to obtain flour from this the nearest and only point where it could be had. From the right confluent of the Ak-baital, the Pshart, the favourite wandering place of the local Kirghiz, he crossed to one of the right affluents of the Murghab, called in its lower part Chat-tokoi, and through its narrow valley reached the

Murghab. Following the downward course of this river, running through an almost impassable defile, he reached with great difficulty picturesque Serez, and having brought flour by the pass of Karabulak (one of the most difficult in the whole journey), he came out to the north on the Great Pamir, lying to the west of the Ak-baital, and by the valley of the river Tash-kul reached the mouth of the Takht-kurum where he found his colleagues, who had come from the Murghab across the upper Ak-baital, and past the Kukui-bel, through the defile Shurala, debouching at Kok-yar on the Takht-kurum.

At Kok-yar, the remarkable dwelling place of the old barantatch * Sahib-Naza, well known in all this district, the expedition once more divided: Putiata and Bendersky went down the valley of the river Kudara with the object of, if possible, exploring that part of the Murghab which is called Bartang or Roshan; but after two days they were compelled to return, owing to information received as to the political condition of Roshan, and to the difficulty of the route along the Murghab, and then went northward through the Pass of Djangi-davan, a little to the west of the Takht-kurum. Having experienced here unusual difficulties the explorers travelled to the Belen-kük, which Bendersky followed down to the glacier Fedshenko, a feat of great danger which the expedition of Oshanin, in 1878, had failed to accomplish. Ivanoff from Kok-yar also went north through the Pass of Takhta-kurum, and having done one day's journey down the river Belen-kük, crossed the glacier to the river Kaindi, descending the latter to Altin-Mazar on the Muk-su; having made an excursion to the glacier Fedshenko and seen the gold-washing works there, he reached Daraut-kurgan by the Pass of Ters-agar, there to await the transport from Margelan with the necessary purchases.

At Daraut-kurgan the different divisions of the expedition reunited in order to replenish their stores and continue their explorations. It was proposed that Ivanoff should undertake the exploration of Darwaz and Northern Karateghin, returning afterwards through Margelan, whilst Putiata and Bendersky, journeying through Gharm to Kala-i-Khumb, should go down the Amu through Kulab, and return home by way of Samarkand, which would take about a month and a half in either case.

The results obtained by the expedition are very considerable. A five-verst map of the whole of this extensive region; numerous barometrical determinations of heights † (by aneroid and by calculation); considerable geological collections, throwing light, in connection with former geological discoveries, on the formation of the region; observations upon the general physical characteristics of the country; thermometrical data; flora; about a hundred drawings by Ivanoff; and many observations in

* i. e. leader of "baranta," or robber band.

† Ivanoff's party took observations, whenever it touched upon unknown parts, in connection with the labours of Bendersky.

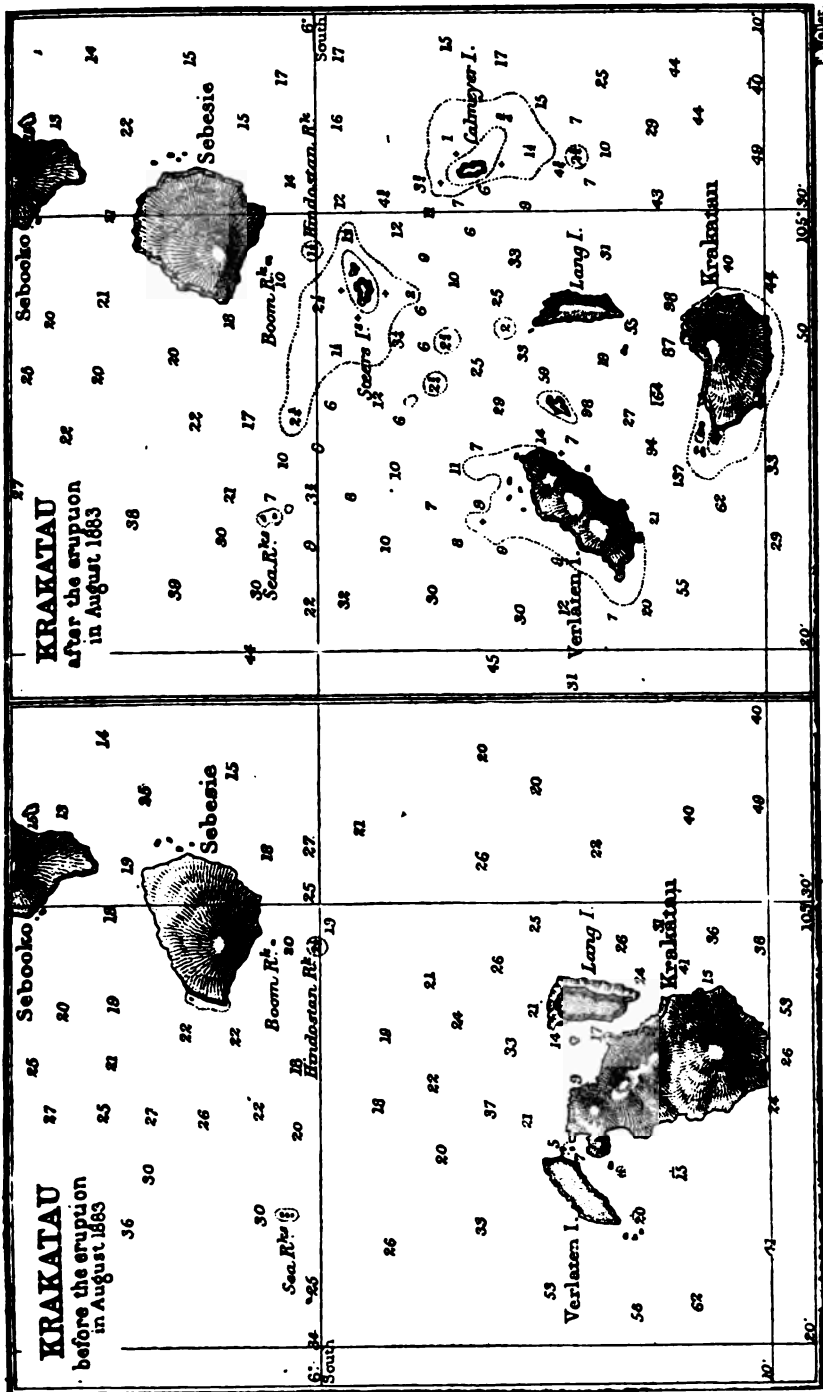
other departments of science, as well as the astronomical determination of many points by Captain Putiata; all this forms a very considerable amount of material obtained by the expedition. When the expedition terminates its labours this winter, Mr. Ivanoff will return to St. Petersburg to reduce to order the various materials collected by him in the vast regions constituting the highest portion of Central Asia, which has long borne the name of "the Roof of the World."

The Volcanic Eruption of Krakatau.

With a Map.

CONSIDERING that the volcanic eruption, of which the Straits of Sunda have been for the last eight months the centre, is among the most stupendous of our times, and that the attendant phenomena have given rise to many questions of the highest scientific, and we may add, geographical, interest, a *resumé* of the facts compiled from all the latest available sources may be interesting to our readers.

The island of Krakatau (such, and not Krakatoa, is the native name) is situated in latitude $6^{\circ} 7' S.$, longitude $105^{\circ} 26' E.$, in the fair-way of the Sunda Straits, about equally distant from Java and Sumatra, close on 26 miles W.S.W. from the village and lighthouse of Anjer, the call-port or signal station, prior to the present eruption, for all vessels passing through that frequented channel. It was a small uninhabited island about five miles in length and three in breadth, culminating in two elevations, the taller of which, known as the Peak of Krakatau, rises (or did rise) some 2750 feet above the sea. Surrounding it on all sides are numerous volcanic cones. The Tengamoes (or Kaiser's Peak) to its north-west is situated at the head of the Semangka Bay, and the quiescent Rajabasa to its north-east in the southern promontory of Sumatra; in the east by south the Karang smoulders in Bantam, and south-east rise the active cones of the Buitenzorg Mountains. Standing in the Straits and very little to the north of Krakatau are the two dormant or dead cones of Sebesie and Sebooko. A line drawn from Rajabasa, passing along the western side of Krakatau and continued thence to Prince's Island, which lies off Java Head, would mark the boundary on the eastward side of the shallow Java Sea, which rarely exceeds fifty fathoms, and on the west side of the deep Indian Ocean. On looking at the accompanying map of the locality before the eruption it will be seen that close to the east and north-west sides of Krakatau, there are two small fragments of land, Lang and Verlaten islands respectively. It is Mr. Norman Lockyer's opinion that these are two higher edges of the old rim of a subsided crater, overflowed in part by the sea through inequalities in the margin between them; that the heights on Krakatau itself, the



remaining portion of the old volcano summit, are cones elevated on this old crater floor; and that the ancient funnel is practically co-extensive with the area inclosed by these three islets, though, till the 20th of May last, blocked up by volcanic débris.

The earliest accounts of Krakatau we have been able to obtain, are contained in a curious old volume, 'Aenmerckelijke Reysen van Elias Hesse nae en in Oost-Indien van 't jaar 1680 tot 1684,' published in Utrecht in 1694. The author relates that he passed on the 19th of November, 1681, "the island of Cracatouw which is uninhabited. It had about a year before broken out in eruption. It can be seen far at sea, when one is still many miles distant from it, on account of the continually ascending smoke of the fire; we were with our ship very close under the shore; we could perfectly well and accurately see the wholly burnt trees on the top of the mountain, but not the fire itself." About the same period Johann Wilhelm Vogel, one of the Dutch East India Company's servants, who published in 1716 a very interesting account of his travels there, passed through the Straits. He says, "On February 1st, 1681, by God's help in front of the Straits of Sunda, where with great astonishment I saw that the island of Cracketouw, which on my former journey to Sumatra appeared so very green and gay with trees, lay now altogether burnt up and waste before our eyes, and spued out fire from great fireholes. And on inquiry at the ship *Captain* . . . at what time it broke out . . . I was told that it was in May 1680 . . . The former year, and when he was on his voyage from Bengal, he had met with a great storm, and about ten miles from this island he encountered an earthquake on the sea, followed by most frightful thunders and cracklings, from which he imagined that an island or else a piece of the land had burst up, and shortly thereafter, as they drew a little closer with the ship to the land, and were come near to the mouth of the Sunda Straits, it was evident that the island of Cracketouw had burst out; and his conjecture was correct, for he and all the ship's company perceived the strong sulphur-atmosphere, also the sea covered with pumice . . . which they scooped up as curiosities." Save for the observations of passing travellers, by whom the great beauty of its tree-clad slopes, the first verdant spot to meet the eye after weary weeks at sea, has been gratefully described, the volcano, after it died out, has had an uneventful and unrecorded history.

On the 20th of May last year, at half-past ten in the forenoon, the inhabitants of Batavia were astounded by hearing a dull booming noise, whether proceeding from the air or from below was doubtful, soon followed by the forcible drumming and rattling of all the doors and windows in the place. The commotion was strongest between half-past ten and one o'clock in the day and between seven and eight in the evening. About midday a curious circumstance was observed, that in some spots in the city no vibrations were perceived although the surrounding

buildings were experiencing them. It was at once concluded that a volcanic eruption of an alarming character had taken place, but for some time it was impossible to localise the direction of the sounds, though the west was the quarter of the compass to which most people assigned them.

A report issued next day by the Director of the Observatory in Batavia, stated that as he had no instruments for recording the intensity and direction of earthquake shocks, he could certify only that no increase of earth magnetism accompanied the tremblings—the photographs indicating nothing abnormal; and that the quivering was absolutely vertical throughout the periods mentioned above; for a suspended magnet with an exact registering apparatus gave no indications of the slightest horizontal oscillations, but alone of vertical vibrations. This was verified by the observations of one of the philosophical instrument makers in the town on a pendulum in his shop, where only vertical trillings were observable at a time when the windows and glass doors of the house were rattling, just as if shaken by the hand, in so violent a way that it was difficult to carry on conversation. Nowhere, however, do there seem to have been observed any shocks of a true or undulatory earthquake. From midnight of the 20th throughout the forenoon of the 21st the tremulations continued very distinct. The same morning a thin sprinkling of ashes fell, “whence is not known,” both at Telok-betong and at Semangka, situated in Sumatra at the head of the Lampong and Semangka bays respectively. At Buitenzorg, 30 miles south of Batavia, the same phenomena were observed; while in the mountains farther to the south-west they were even more pronounced, and the Karang, a mountain situated about west from Batavia, it was thought must be the seat of disturbance. By this time the general opinion had decidedly ascribed to the west or north-west the direction whence the movements were proceeding. Krakatau itself was even named; but some of the Sumatran mountains were considered more likely to be the delinquents. Batavia being connected with that island by a telegraph line passing along the north coast of Java to Anjer, across the Straits of Sunda to Telok-betong, thence northwards to Palembang on the east, and to Padang on the west coast, intelligence from all parts soon began to come in; but none of any eruption anywhere, beyond the notice of the fall of ashes mentioned above. Anjer telegraphed “Nothing of the nature of an earthquake known or felt here.” This was dated 21st; a message in much the same terms had been received on the previous day, as well as the report of one of the Government officials to the following effect: “On Sunday morning, the 20th, I landed at Anjer and there stayed till one o’clock in the afternoon; at half-past three I reached Serang and halted an hour. Neither I nor my coachman, either at Anjer or at Serang, or on my whole journey to Tangerang (near Batavia) felt or heard any earthquake or disturbance, or anything at all remarkable.”

Anjer lies on the narrowest part of the Sunda Strait, 27 miles from Krakatau, which formed a prominent object in one's seaward view from the verandah of its quiet little hotel on the sea margin. This hotel was kept by one of Lloyd's agents, Mr. Schuit (whose family perished in the subsequent disaster), who had in his verandah a powerful telescope for reading the signals of ships for report to Batavia, and by whom consequently any occurrence in the Strait could scarcely fail to be observed. Thus during the period of greatest disturbance in Batavia and Buitenzorg, when men there were referring the origin to Krakatau, 80 miles away, at Anjer, only 27 miles distant from it, nothing was felt or heard. The same report was made from Merak, likewise situated on the Straits, 35 miles from, and presenting a clear outlook to the volcano. The winds prevalent in this region during the month of May are from the east, and would tend to drive any smoke and ashes toward the Indian Ocean, which might explain their not being detected from Anjer; but the direction of the wind fails to account for the entire absence in that and the surrounding villages of the phenomena which were most conspicuous in Batavia.

Not till the evening of the 21st was smoke observed to be issuing from Krakatau; on the 22nd the volcanic vent there seems to have been fully established, and the vibrations and other phenomena experienced in Batavia quickly subsided. Now, in a letter to *Nature*, Mr. H. O. Forbes has recorded the passage, during the 11th and 12th of July, of the ship (on board which he was returning to England) through extensive fields of pumice spread over the ocean north and south as far as the eye could reach. The vessel passed the volcano on the 9th, but till the evening of the 10th, when the steamer would be about a degree to the west (a little northerly) of her noon position, which was $102^{\circ} 25'$ E. long., $6^{\circ} 20'$ S. lat., no pumice was observed. During the whole of the 11th the vessel was surrounded by the pumice sheet, which about noon of the 12th, in $93^{\circ} 54'$ E. long., $5^{\circ} 53'$ S. lat., suddenly terminated, shortly after it had appeared in greatest amount, while a current had been encountered after leaving the entrance to the Straits, running against the ship's course at the rate of a quarter of a mile an hour. The pumice nodules were considerably worn, but many pieces were observed as large as a child's head. Several lumps were picked up infested with barnacles, of from 1 to $1\frac{1}{2}$ inches in length, which represented at least some four or five weeks' growth.

The specimens of pumice obtained at sea have been submitted to Professor Judd and the committee appointed by the Royal Society for the examination of the phenomena connected with the eruption. If, on analysis, they should prove different in composition from specimens obtained directly from the volcano, a different origin will have been established for them; but should both turn out to have identically the same components, it will not necessarily prove that both have come from

the same crater. The Peninsular and Oriental Company's steamer *Siam*, on her voyage from King George's Sound to Colombo, sailed for four hours, on August 1st, through a similar "lava" (pumice) sheet, in lat. 6° S., and 89° E. long., the nearest land, the coast of Sumatra, being 700 miles off, and the current then running eastward at from 15 to 30 miles a day. The soundings at the spot reached 2000 fathoms. Mr. Forbes, who incidentally referred to the eruption when reading his paper before the Society on the 28th of January last, suggested that the sounds heard in Batavia on the 20th of May, which were altogether unperceived at spots so near Krakatau as Anjer, Merak, and Telok-betong, which would be inexplicable if they really originated there, were the result of a submarine eruption in the Indian Ocean, somewhere south-westerly from Java Head; and that the tremors were propagated thither perhaps by continuous strata connecting the *locale* of the outburst with Batavia, Buitenzorg, and more especially with the hills to the south-west, where the manifestations were so distinctly perceived. We know from Mr. Darwin's* and Mr. Forbes'† observations, that a centre of volcanic disturbance does exist in that direction, in the Keeling Atoll, situated 600 miles west by south from the mouth of the Straits. Whether or not anything unusual has been experienced in these islands about the third week of May, no intelligence has yet reached this country. We know from what occurred at Graham's Island, that pumice ejected from the sea-bottom rises to the surface, and an examination of the chart of the currents in the Indian Ocean at once shows that any flotsam in the region between west and south from Java Head in that longitude, could be drifted to the locality in which it was observed in the month of July. If such a submarine outburst did take place, Mr. Forbes suggested that somehow the orifice very soon became blocked after a great inrush of water had taken place, which becoming transformed into steam under enormous pressure, shaped its course for the nearest old earth-scar, and found vent in Krakatau, by an offshoot probably of the funnel of the eruption of 1680. That such large lumps of pumice should be carried 700 miles westward into the Indian Ocean does not seem probable, and is not supported by any observations. The earlier outbursts were not of very unwonted vigour, for no pieces of any size are reported to have fallen on the neighbouring coasts of Java and Sumatra; even after those of August, no ship farther off than 100 miles speaks of the fall of any but the "finest dust and sand."

On the 23rd of May, a ship encountered at Flat Cape in Sumatra, a large amount of pumice on the sea, which increased in amount as Krakatau was neared. Of the appearance of the volcano on the 27th, we have a graphic account in the *Algemeen Dagblad* newspaper, of Batavia, by one of a party that ascended to the crater on that day. As they approached the

* 'Narrative of Survey Voyages of the *Adventure* and *Beagle*,' vol. iii.

† Proc. R.G.S., Dec. 1879.

scene, the neighbouring islands had the appearance of being covered with snow. The crater was seen to be situated not on the peak, but in a hollow of the ground, which lay from south-east to north-west, sloping towards the north point, in front and to the north side of the lower summit, looking towards Verlaten Island. Both heights were seen; the southerly green, and the more northerly and much lower one quite covered with dust and ashes. The volcano was ejecting, with a great noise, masses of pumice, molten stone, and volumes of steam and smoke, part of which was being carried away westward by the monsoon wind, dropping all round and close at hand its larger pieces, while a higher rising cloud is specially recorded as driving away eastward, having evidently encountered a current in that direction in the upper air. Some of this dust-cloud was carried far to the eastward, for Mr. Forbes relates that on the morning of the 24th of May, when in the island of Timor, 1200 miles distant, he observed on the verandah of his hut, situated high in the hills behind Dilly, a sprinkling of small particles of a greyish cinder to which his attention was more particularly drawn later on that and the next day, by their repeated falling with a sudden pat on the page before him. The visitors to the crater seem to have viewed with most amazement the grandeur of the smoke column whirling upward with a terrific roar like a gigantic whirlwind, through whose sides the ascending ejecta, vainly trying to break, were constantly sucked back and borne upwards round and round into the centre of its Stygian coils. The trees which once clothed this portion of the island presented only bare stems from which their crowns had disappeared, evidently not by fire, for there was no charring visible on them, but rather as if wrenched off by a whirlwind—perhaps of the crater itself.

After the 28th curiosity in these volcanic phenomena seems to have abated, and during the next eight or nine weeks, though the eruption continued with great vigour, little is recorded of its progress; indeed so completely did it seem to have been forgotten, that visitors to Batavia, unless they had made inquiries, might have failed to hear of its existence at all. During this period no local disturbances to attract attention or to cause the least alarm are recorded. From the logs of ships in the neighbourhood of the Straits, about the middle of August, numerous extracts have been published; but many of them show that they have been written either with the mind bewildered and confused by the terrifying incidents amid which the officers found themselves, or from the after-recollection of the events, of which under such conditions the important dry facts of time, place, and succession, are liable to be unconsciously mis-stated. Much is therefore lost which might have been known; but a few are of the utmost value.

On the 21st of August the volcano appears to have been in increased activity; for the ship *Bay of Naples* reports being unable to venture into the Straits on account of the great fall of pumice and ashes.

The first, however, of the more disastrous effects were experienced on the evening of the 26th, commencing about four o'clock in the afternoon. They were inaugurated by violent explosions, heard in Anjer, Telokbetong, and as far as Batavia, accompanied by high waves, which after first retreating rolled upon both sides of the Straits, causing much damage to the villages there, and were followed by a night of unusually pitchy darkness. These horrors continued all night with increasing violence, till midnight, when they were augmented by electrical phenomena on a terrifying scale, which enveloped not only the ships in the vicinity but embraced those at a distance of even ten to a dozen miles. As the lurid gleams that played on the gigantic column of smoke and ashes were seen in Batavia, 80 miles off in a straight line, we can form some idea of the great height to which the débris, some of which fell as fine ashes in Cheribon 500 miles to the east, was being ejected during the night.

Between five and seven o'clock (for the hour is uncertain) in the morning of the 27th, there was a still more gigantic explosion, heard in the Andaman Islands and in India, which produced along both shores of the Strait an immense tidal movement, first of recession and then of unwonted rise, occasioning that calamitous loss of life of which we have all heard.

The material thrown out rose to an elevation which we have no means of estimating, but so tremendous was it that on spreading itself out it covered the whole western end of Java and the south of Sumatra for hundreds of square miles with a pall of impenetrable darkness. During this period abnormal atmospheric and magnetic displays were observed; compass needles rotated violently, and the barometer rose and fell many tenths of an inch in a minute. Following at no great interval, and somewhere between ten and twelve o'clock in the forenoon of the same day, either by successive rapid outbursts or by one single supreme convulsion, the subterranean powers burst their prison walls with a detonation so terrific as to have been, as it seems, inaudible from its very immensity to human ears in its close vicinity, but which spread consternation and alarm among the dwellers within a circle whose diameter lay across nearly 3000 miles, or 50 degrees of longitude.

With sunrise on the 28th the dense curtain which had enveloped so wide an area in darkness gradually began to clear off, and the light broke on a scene of devastation of the saddest kind, but on one of comparative placidity, as if Nature lay exhausted after her frantic paroxysm. Krakatau was seen reduced to a fraction of its original size; the whole of the northern portion, with the height in front of which the volcano first broke out, and half of the peak itself had vanished (see the accompanying map). To the northward, however, two new pieces of land, which have received the names of Steers and Calmeyer islands, raised their tops above the surface of the sea, where the morning previous 30 to 40 fathoms of water had existed. Of the two islets on each side of

Krakatau, Lang Island is left practically unaltered, while Verlaten Island seems elevated somewhat, and is reported to be in eruption. But where the volcano had been so active a few hours before, a sea fathomless with a line of a thousand feet is now to be found.

Having thus followed the succession of events there remains little doubt that the crater on the 26th of August by its constant action had either cleared out the old funnel into its submerged portion, or that a rent by subsidence or otherwise was formed, through which a volume of water was admitted to the heated interior, resulting in explosion after explosion in increasing violence, as more material for generating steam was finding its way into the underground recesses.

The first great waves on the evening of the 26th and the early part of the 27th were probably caused by a portion of Krakatau being shot out northwards for eight miles and dropped where we have now Steers Island; while the appalling detonation in that forenoon and the greater wave accompanying it resulted perhaps from that still more titanic effort which lifted the greater portion of Krakatau—several thousand million cubic yards of material—out by its 170 fathom root, hurled it through the air over Lang Island, and plunged it into the sea some seven miles to the north-east, where Calmeyer Island now blocks the channel which mariners have known so long as the East Passage.

The reports we have as to the tidal phenomena differ from different places. At many points it was observed that a distinct withdrawal of the water preceded the rise or great tide; while from others, as in the canal at Batavia, the opposite is given as the order of occurrence. Everything, however, depends on the moment of the observation. It will be apparent that these waves were the most natural consequents of the events, and were due certainly not to any seismic movement of the sea-bed, but, on the one hand to the inrush of water to fill the deep chasms out of which the ejected portions of the island came, which was naturally followed first by a withdrawal of the water, and then by a disastrous recoil over the low foreshores of Java and Sumatra; and on the other hand to the tremendous stroke—the splash, in fact—imparted to the sea by such a gigantic block of matter, square miles in size, which must have resulted first in a great rise of water followed by a withdrawal.

It is a remarkable circumstance that in the logs of several ships which were in the close vicinity of the volcano in the forenoon of the 27th, no mention is made of the great wave which proved so destructive, and which could scarcely, one conceives, have failed to attract attention. May the explanation not lie in the supposition that these two great waves—the inrush and the splash waves—which would follow each other after a short interval, had neutralised each other at the spots where these vessels chanced to be at the moment? Issuing from the narrow straits into the oceans east and west these waves started off on

their journey round the globe, and from the records of the tide gauges which are now coming in, we have a most remarkable tale unfolded. On the afternoon of the same day that the greater of them swept away the Javan villages, the undulations were registered unmistakably in Mauritius, the Seychelles, in South Africa, and on the shores of the Pacific Islands; but as Mr. Lockyer informs us, they did not vanish there, but proceeded onwards, and crossing each other on the antipodes of Krakatau, journeyed back to the spot whence they had emanated, and this they did no fewer than four times before the equilibrium of the sea was restored so far as to be insensible to our instruments. While the tide gauges have recorded their story, the delicate fingers of the barometrical registers of the world have also borne uninfluenced testimony of a similar kind. The blow which hurled such a mass of matter into the air, which originated a hurricane there and caused the barometers in the neighbourhood of the volcano to rise and fall with unparalleled rapidity and a vessel distant 300 miles to tremble, started an atmospheric wave also round the globe. It was first detected in the Kew registers, we believe, by General Strachey, who has now examined a large number of barographs, from which he has been able to fix the dates at which the atmospheric undulations passed various places on the earth's surface. As in the sea, so in the air, two waves, one to the east and one to the west, started from Krakatau, whose rate of progress has been found to be that of sound. One surprising circumstance, of which we have as yet observed no explanation, is how those ships which were near the volcano at the moment of the supreme explosions, of the enormity of which they seem not to have been cognisant, notwithstanding that they were heard at such immense distances, did not only not suffer from the concussion, but were not blown off the face of the water altogether. Almost coincident with the record of the abnormal atmospheric fluctuations, magnificent sunlight effects, unusually lurid skies, prolonged dawns, lengthened twilights, and green or blue or moon-like suns began to be observed. From the dates at which these phenomena first appeared in different parts of the world—on the east coast of Africa on the second day, the Gold Coast on the third, Trinidad on the sixth day, at 4000 miles in the Pacific west of Panama on the seventh, and at Honolulu on the ninth day—it can be seen that the volcanic cloud followed a straight path.

To what height the supreme outburst propelled the smoke, dust, and the lighter portion of matter, it is impossible at present to estimate. Mr. Whympster saw Cotopaxi, in by no means one of its extraordinary expirations, eject a column over 20,000 feet in height; but many multiples of this distance will doubtless be required to measure the spire that was shot sky-ward on the forenoon of the 27th of August last. At all events it rose so high that months have been required for it to descend. Those places situated below the direct westward path of the

cloud, which would be elevated at first as a narrow column, as they were carried under it by the eastward rotation of the earth, were the first to have the usual light of the sun changed into ominous displays or delightful after-gloves, varying in intensity according to their time-distance away, and therefore to the amount of the obstructing dust, which would also condense moisture in the upper part of the air, and give special absorption effects,* that had by the hour they were reached subsided from the atmosphere. This narrow band gradually spreading out north and south enabled the inhabitants of all lands to obtain a view of the gorgeous effects of broken and absorbed sunbeams, and a demonstration of the vastness of the power of imprisoned steam.

Many questions connected with the subject remain at present unexplained; but the difficulties will in great part doubtless disappear before our fuller information. A committee of the Royal Society, consisting of our highest authorities in meteorological, volcanic, and light phenomena, has, as we have said, been appointed to fully investigate the subject, and from their labours we shall by-and-by be in possession of the first really accurate and scientific examination of the effects of volcanic eruptions, which in this case bids likely to result to meteorological science at least, in a gain whose immense importance it is impossible now to calculate. Nor is it unlikely that this "biggest terrestrial experiment" afforded us by Nature may ultimately prove to have been not the least of her beneficent gifts to humanity.

GEOGRAPHICAL NOTES.

Public Schools Prize Medals.—The Council have decided to discontinue, after the present year, the Examinations in Geography at the Public Schools conducted annually under their auspices since 1869.—The medals offered yearly for geographical proficiency at the Oxford and Cambridge Local Examinations are not affected by this decision, but will be continued as heretofore.

Lupton Bey and the Bahr Ghazal Region.—We have received letters from Mr. F. Lupton, Egyptian Governor of the Bahr Ghazal Province, of various dates down to November 10th, and bearing the Khartum post-mark of January 19th. They contain much interesting geographical information and a map of the region travelled over by Mr. Lupton or his agents, as far as the Khuta river, a large stream which is thought to be a tributary of the Congo. Lupton has been in almost incessant war with the Mahdi's followers, and was looking forward anxiously to the arrival of General Hicks. The geographical portions

* Cf. *Nature*, Feb. 21, 1884, pp. 381-2.

of his letters will form the subject of a paper to be read, we hope, at our next meeting, March 10th.

Completion of Mr. O'Neill's Journey to Lake Shirwa and the Sources of the Lujenda.—We learn by telegram from Mozambique, February 2nd, that Mr. O'Neill had safely returned from his important journey to Lake Shirwa. He has discovered that the Lujenda river has its sources in a small narrow lake to the north of Lake Shirwa. The following are the words of his telegram :—"Latitude observations along the northern shore of Lake Shirwa show the extreme northern limit to be $14^{\circ} 59'$ S. The river Lujenda commences as a narrow stream in $14^{\circ} 19'$ S. Between the parallels of $14^{\circ} 19'$ and $14^{\circ} 32'$ S. lies Lake Amaramba, the greatest breadth of which is one and a half to two miles. South of Lake Amaramba flows the river Msambiti connecting it with the lake and swamp Chicota $14^{\circ} 52'$ S. On my return route I followed the valley of the Likungu from the Namuli Hills to $16^{\circ} 15'$ S., and then striking east arrived at the coast at Angoche. The principal rivers crossed were the Likungu, the Mlela, the Muluga, the Liconya, and the Mluli."—We are informed by a subsequent telegram sent through Sir James Anderson, Chairman of the Eastern Telegraph Company, that the continuation of Mr. O'Neill's narrative and observations had been despatched to England ; the first part, relating to the outward route from Mozambique to Lake Shirwa, was forwarded via Blantyre and the river Shiré, and reached London early last month.

The Chief Mandara of Moschi on the slopes of Mount Kilimanjaro.—Mr. Joseph Thomson, before leaving the neighbourhood of Mount Kilimanjaro, last summer, on his final departure for the unexplored interior, paid a visit to the important chief Mandara, the same who treated the Rev. Charles New so cruelly in 1875, treatment which no doubt hastened the death of that admirable traveller. The chief appears to have repented of his behaviour to Mr. New, for he gave up to Mr. Thomson a gold chronometer watch formerly belonging to him, to be returned "with Mandara's regrets," to the relatives of Mr. New. The following is a testimonial in respect of Mandara, which Thomson, at the barbaric chief's request, wrote on the spot:—"Taveta, July 7th. The Consul-General, Zanzibar, or others whom it may concern. At the request of Mandara, of Moschi, the terror of Chaga, and the great warrior of these parts, I beg to state that I have been to Mandara's, and been there received in a royal and pleasant fashion, but left with feelings of a mingled character, leaving several desirable objects behind. Mandara desires it to be known that he is anxious to receive a shoal of European visitors in the same manner. He sends his salaams to the Buluza (English Political Agent), and to all prospective visitors. He would like to receive unlimited quantities of guns and gunpowder. Let no one go with empty hands."—We have received no news of Mr. Thomson since August 1st,

when he was reported by a native caravan to have been seen near Lake Naivash. His last letter is dated July 10th.

Recent Travel in South Central Africa.—We have received from Mr. R. C. Williams, F.R.G.S., whose former letter from Shoshong appeared in the last vol. of our 'Proceedings,' p. 484, another letter dated 7th Dec. last, and written at Gubuluwayo, Matabele Land, in which he announces his arrival with his wife and child at the Victoria Falls—being the first recorded instance of an Englishwoman reaching that point of the Zambesi. This communication, like its predecessor, fully shows the present safe condition of the Matabele and Makalaka countries for travellers, in spite of rumours to the contrary. Mr. Williams first journeyed from Baman-gwato to Gubuluwayo, to obtain Lobengula's permission to travel through his territories, and found that chief most kind, even giving sheep for food on the road. Leaving Gubuluwayo on June 26th, Mr. Williams fell in with an impi of 6000 or 7000 Matabele warriors at the Nata river, returning with spoils taken from the Bechuanas of Ngami, with whom they were at war. Though some of these men were actually starving, they stole nothing, but fully acknowledged Lobengula's protection of the travellers, with whom they were quite friendly. The journey down the Nata was found very difficult, the region being less frequented by hunters than formerly; and it was only by cutting through the bush that the road from Tati to the Zambesi could be found. After crossing the heavy sandy desert, Panda-ma-tenka was reached on July 28th, its only present inhabitants being a well-known trader Mr. Westbeech and some Jesuit missionaries, as no native settlement any longer exists there. After reaching the falls, the usual fever and sickness of the Zambesi valley attacked the party, who returned to the more healthy Matabele country early in December. Though evidently not believing much in the chance of missionary success here, Mr. Williams speaks most highly of the Jesuits whom he met at Panda-ma-tenka, and also of an unattached Scotch missionary, Mr. Arnot.

The Greely Relief Expedition.—The United States Government have purchased at Dundee the *Thetis* as one of the vessels of the Relief Expedition to Smith Sound; she will be taken to America by Lieut. Reamy, U.S.N. The *Bear*, a sealing vessel, has also been bought in Newfoundland. Our Government have given the *Alert*, one of the ships of the Arctic Expedition under Sir G. Nares, and she will be taken over by Commander Goodrich. It is believed that the command of the Expedition will be intrusted to Captain Sohley.

The late Commander De Long.—The remains of the ill-fated Commander of the *Jeannette* expedition and his companions, disinterred from their graves in the inhospitable Lena Delta, arrived in New York on the 22nd of February, after their long journey across Siberia and Europe to Hamburg and thence across the Atlantic. The public funeral at Woodlawn

cemetery, Brooklyn, on the 23rd was an imposing ceremony; Mr. W. Lane Booker, H.M. Consul-General at New York, at the request of our Council, represented the Society at the funeral.—In December last our President, Lord Aberdare, on behalf of the Council addressed the following letter to the widow of the late Commander, testifying to the estimation in which his merits were held by the geographers of England:—“December 10th, 1883. Madam,—In the name and on behalf of the Council of the Royal Geographical Society, it is with feelings of warm sympathy that I convey to you the congratulations of that body on the publication of the journals of your late gallant husband. If anything could increase the regret that is felt by geographers at the loss of Lieutenant De Long, it would be the evidence which abounds in his journal of those noble qualities which endeared him to the officers and men who served under his command, in the daring and difficult enterprise which he strove so gallantly to achieve. If events had been ordained otherwise, it would have been the pleasant duty of the Royal Geographical Society to welcome Lieutenant De Long on his return, and to give due recognition to the great service he performed to geography. It now only remains for the President and Council to express their sense of the great loss that geographical science has sustained, and to request the widow of Lieutenant De Long to accept our heartfelt sympathy in her sorrow, a sorrow which is shared not only by geographers, but by all who admire those qualities which were so eminently displayed in the life of her late gallant husband.—I have, &c., ABERDARE, President Royal Geographical Society.”

Greenland.—In consequence of the recent journey of Professor Nordenskiöld in Greenland, Mr. Edward Whymper has published some information in respect to his travels, which he had intended to reserve until his explorations were completed. Two articles have appeared in *Good Words* for January and February, and in the March part he states that the glacier-clad interior of Greenland in lat. 70–71°, considerably exceeds the height of 10,000 feet. He describes having viewed it continuously from 68° 30' to 71° 15', and that it everywhere presents the same characteristics, namely, a high and nearly level ridge, so absolutely covered by snow and ice that not a single rock or crag is seen breaking the line. He states also that the outskirting country on the coast of Davis Straits has experienced great upheaval in comparatively recent times, and that many of the highest mountains are strewn with drifted rocks right up to their summits. He obtained nine species of bivalves at the height of 550 feet above the sea, and many others at a lower elevation. Part of the paper is occupied by references to the fossil flora. Mr. Whymper has made collections of fossil leaves, &c., at ten different localities, and says, “the evidence is already overwhelming that, in the past, vegetation flourished there of a character now unknown in the country, and that there was a dense and luxuriant forest growth

which extended over nearly a hundred miles, reckoning from north to south."

The Reykjanæs Peninsula, Iceland.—Dr. Thoroddsen, the Icelandic geologist, has sent to the Danish Geographical Society an account of his explorations during last summer of the district of Reykjanæs and its volcanoes. Although many parts of the island bear indications of volcanic action, there is no place where they are more apparent and closer together than on this peninsula. It is almost covered with lava, and so perforated with craters, sulphur-vents, and hot springs, that hardly any free land exists. In spite of the peninsula being close to inhabited districts it has up to the present remained comparatively little known, geologically as well as geographically, on account of the total absence in the interior of vegetation and water. Formerly only two volcanoes, Thurrárhraun and Trölladyngja, which had been active in historical times, were known here, but Dr. Thoroddsen has now discovered thirty larger and smaller volcanoes, five of which at least have been in eruption in historical times. He has also discovered that a mountain range does not, as hitherto supposed, run through the entire peninsula, but that the interior is formed of a large plateau with hillocks, crossed by valleys. On the edge of the plateau the volcanoes lie as close as beads on a string for many miles. As regards the geological construction of the peninsula, the eastern and southern part is chiefly built of palagonite-breccia, while the northern is covered with doleritic pre-glacial lava-streams, which were formerly believed to exist only at Ok and in the neighbourhood of Reykjavik. These minerals are in several places overlaid with new lava. Dr. Thoroddsen has also examined the geological conditions of Borgarfjardarsýsla and the hot springs there, and travelled across part of the great interior table-land of Iceland to the Langjökul, and explored the volcano Skjaldbreidur, which is 3400 feet high, and has a crater 900 feet in diameter. The Althing has voted a sum of money to Herr Thoroddsen for the continuation of his researches this summer, when he intends exploring the great unknown lava district Odáðahraun, in Central Iceland.

Recent Explorations in the South-eastern Coast Region of New Guinea.—A letter from Port Moresby, dated December 4th, in the *Sydney Mail* of January 5th, states, among other interesting items of news, that Mr. Chalmers had returned from a voyage along the coast (to the west?) in a native trading canoe, the *Lakatoi*. He discovered a new river, which he has named the Wykeham, and thinks that this and a number of other river mouths in the neighbourhood form the delta of one great river which drains this part of New Guinea, and probably the northern side of the great mountain range. He visited some remarkable tribes of cannibals and saw "magnificent temples," surpassing anything before seen in New Guinea. It is thought at Port Moresby that

D'Albortis in his boat voyage up the Fly river probably missed the main body of water, which is most likely to the east of his route.

The Carr-Boyd Expedition, Western Australia.—We regret to hear that Mr. D. S. Carr-Boyd, a surveyor under the Queensland Government, who had commenced explorations in the almost unknown border land between the northern territory of Southern and Western Australia, died suddenly of heart disease on Nov. 25th last. A telegram dated October 18th, received at Adelaide by the Postmaster-General, and published in the *Melbourne Argus*, contains some details of his work. He appears to have struck the upper course of the Victoria river on the eighth day, some 20 (evidently a misprint for 200) miles from Delamere Station, after travelling in a southerly direction by Gregory's Creek. The Victoria (which flows into the Timor or Arafura Sea in the Northern Territory, very near the West Australian boundary line), was followed up for 35 miles, when a tributary from the west was struck and ascended for one day, the journey being continued across splendid open plains, and another large tributary found, which, on the return of the expedition, proved to be one of the main branches of the Victoria. Leaving this, a generally south-west course was steered to Stirling Creek, which was followed down wherever practicable to where it flowed into the Negasi. (It should be observed that the hydrographic conditions here are so peculiar, and the country itself so little explored, that even with the latest map giving details of every point as yet known, it is impossible to understand this route clearly.) The Negasi was then followed to a point near its junction with the Ord, the whole country from Delamere Station to this point, some 300 miles, being stated to be composed of the very best pastoral land, thoroughly well watered with running rivers, creeks, and springs, and suitable for any description of stock, as it bears nutritious grasses of various descriptions, and can easily be travelled on the whole way. Having made a depôt at the junction of the Ord and Negasi, the party proceeded to trace the course of the former river, which was found to be entirely different to that laid down on the maps. Rising in Western Australia, for the first 30 miles it runs in a north-westerly direction, afterwards trending more north-easterly, passing into the northern territory of South Australia, over the 129° meridian (the boundary line), and then striking northwards close to the border, and re-entering Western Australian territory. It is impossible here to follow the information, as the Ord is then stated to finally depart from the latter territory "in about latitude 15° 30', running westerly for about 40 miles, then northerly to Cambridge Gulf, being at the time about 30 miles from the northern shore of the Baines river." A good road is stated to exist from it to the navigable waters of the Victoria, and also to Cambridge Gulf, where there is a good harbour: and the opinion was formed that the first place established as a port would command the trade of the extensive pastoral lands of the Ord and its numerous tribu-

taries. The few native dogs observed, together with the absence of poisonous or injurious plants, the abundance of nutritious grasses, and the advantage of first-class shipping ports close at hand, are considered to insure a great future for this as a wool-growing district. The climate of the Ord river, from April to September, is described as delightful, the days being warm and the nights cold, the thermometer sinking to 32°, low enough to produce ice in the water buckets and icicles on the water bags, although not much over 100 miles from the Prince Regent river of West Australia. A large portion of the country is entirely composed of granite, slate, and quartz, the hills being many hundred feet high, and entirely of the latter mineral, giving rise to the opinion that gold will some day be found there extensively. It is added that the meteorological disturbances noticed all over the Australian colonies were heard on August 27th in 17° 40' S. lat. and 128° 30' E. long., the sounds resembling blasts from a quarry and reports of guns, and continuing all day at intervals of from two to fifteen minutes.

REPORT OF THE EVENING MEETINGS, SESSION 1883-4.

Fifth Meeting, 28th January, 1884.—General Sir J. H. LEFROY, K.C.M.G.,
Vice-President, in the Chair.

PRESENTATIONS.—*Henry Wadsworth Syers, Esq.; William Lonsdale, Esq.*

ELECTIONS.—*Edward Fleet Alford, Esq.; Octavius Bates, Esq.; Edward Spencer Burns, Esq.; John William Clark, Esq.; T. Risely Griffith, Esq.; James Wm. Douglas Johnstone, Esq.; Dr. George Horatio Jones; M. D. McEacharn, Esq.; George Moffatt, Esq.; Sydney Platt, Esq., J.P.; J. L. Stuart, Esq., M.A.; Colonel Henry Brabazon Urmston; Josiah Williams, Esq.; William Thomas Wiseman, Esq.*

The following papers were read:—

1. "Three Months' Exploration in the Tenimber Islands, or Timor Laut." By H. O. Forbes.
2. "Note on the Ascent of Ambrym Volcano, in the New Hebrides." By Lieut. C. W. de la Poer Beresford, R.N.

The above are published in the present number, pp. 113 *et seq.*

Sixth Meeting, 11th February, 1884.—The Right Hon. Lord ABERDARE,
President, in the Chair.

PRESENTATION.—*Frederic Bonney, Esq.*

ELECTIONS.—*The Rev. Malcolm C. Baynes; Maharaja Sir Rama Varmá Bahádur, G.C.S.I., Maharaja of Travancore; Charles Cory, Esq.; Major-General E. B. Cureton; Thomas Greenwood, Esq.; Edwin Hodder, Esq.; Capt. Richard Hare Home, B.A.; Lieut.-Colonel George Beresford Knox; James McCarthy, Esq.*

(Surveyor-General in Siam); *John Alexander Swanston, Esq.*; *James Pontifex Woode, Esq.*

Papers read:—

1. "My recent Visit to the Congo." By Major-General Sir Frederic J. Goldsmid, C.B., K.C.S.I.
2. "Notes on the Lower Congo, from its Mouth to Stanley Pool." By E. Delmar Morgan.

Will be published in the next number of the 'Proceedings.'

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—January 17th, 1884: M. BOUQUET DE LA GRYE, President of the Central Commission, in the Chair.—The Chairman announced the constitution of the Bureau of the Central Commission for 1884:—President, M. Bouquet de la Grye, hydrographical engineer; Vice-Presidents, MM. Alph. Milne-Edwards (of the Institute), professor at the Jardin des Plantes, and M. Amédée Barbié du Bocage; General Secretary, M. Maunoir, who, the Chairman said, had for eighteen years discharged his duties in the most exemplary and efficient manner; Assistant Secretary, M. Jules Girard.—M. Bouquet de la Grye then announced that the Central Commission had decided to commence a series of scientific lectures, which would be organised under the auspices of the Society, and be held where the ordinary meetings of the Society took place. These lectures would be open to the public upon payment and be given by members of the Institute, professors of the College of France and the Jardin des Plantes, engineers of mines, &c., e.g. MM. Faye, Daubrée, Milne-Edwards, Bureau, Lapparent. The first of these lectures would be on physical geography.—The Chairman also stated that M. Mizon, who had just returned from the Congo, where, as one of M. de Brazza's young colleagues, he had been displaying great activity, was present at the meeting.—Dr. Harmand, French Commissary-General in Tongking, transmitted to the Society as a curious specimen of geographical science as known among the Annamites, an atlas with all the provinces of Annam, and comprising even those of Lower Cochin China (now called French Cochin China). The atlas contains a general map of Indo-China. The geographer who prepared it must have consulted European maps, for it shows a very correct orientation, and the Annamites, as far as Dr. Harmand knows them, would not be able unaided to reproduce on a map such a vast extent of territory. The defect of all these maps is that they exaggerate in a most childish fashion all the geographical irregularities natural or otherwise which the authors endeavour to represent. The mountains appear as viewed from one side only. The Annamites are incapable of taking general and comprehensive views, not only as regards geography, but, Dr. Harmand adds, in all the circumstances of social and political life they act in the same puerile manner.—Through Dr. Harmand the Society has also received a short report from Dr. Neis, who is engaged on a mission in Upper Laos. This communication was addressed to Dr. Harmand from Luang-Prabang in June 1883, but did not reach him till much later, as the writer thought Dr. Harmand was still at Bangkok, where he had been discharging the duties of French Consul, before being despatched to Tongking. Dr. Neis' report will be inserted *in extenso* in the report of the meetings.—The Minister of Foreign Affairs forwarded to the Society a letter received from M. Ledoulx, French Consul at Zanzibar, dated November 16th, which announced the arrival of M. Revoil in the upper part of the Jub river, and stated that the traveller was in perfect health. He had promised

another letter from Gananeh, but it had not yet reached the Consul, in consequence of the bad state of the communications with the Somali coast during this time of the year. No news had been received of M. Giraud, who had not proceeded to Karema on the 1st of July last as it was expected he would do. M. Ledoux thought that the traveller had taken the northerly route starting from Lake Bangweolo, in order to reach the sources of the Congo more directly.—M. Romanet du Caillaud sent a communication upon the territorial rights of France in the basin of the Red Sea. He states that, as measures are to be taken to define the territory of Obock, it is important that at the same time a report should be drawn up regarding the various parts of the coast which belong to France, and over which the French flag ought to float. He mentions more particularly the Bay of Sheik Saïd, which is situated in front of the English island of Perim, but upon the coast of Arabia. This roadstead has belonged to France since the year 1869, having been acquired, together with a vast extent of territory on its shores, by a Marseilles commercial house. The islands of Ouda and Dessi were obtained in November 1859, from Négousié, king of Tigris. Situated at the entrance to the Bay of Adulis, and consequently occupying a position far superior to that of the island on which Massaua is built, the island of Dessi has good water, pasture-land enough to feed 500 or 600 horned cattle, and three well-sheltered roadsteads, which could be made into excellent harbours. The port of Edd, which was purchased by a Nanto-Bordelaise Company during the reign of Louis Philippe, is also mentioned by M. du Caillaud. The most important, however, of these points is undoubtedly the roadstead of Adulis, the excellence of which was shown when the English expedition was undertaken against Theodore, king of Abyssinia; Lord Napier choosing Adulis as his landing-place. None of these places have as yet been occupied by France. M. R. du Caillaud further states (i.) that at Kouffith in the country of Barea, a French colony was founded in 1864, with the consent of the Egyptian Government, by a Frenchman, Count Raoul Du Bisson, who was one day cruelly driven away by the Vakhil of Kassala, under the pretext that this colony was dangerous to the Egyptian authority in Nubia; (ii.) that before the disasters of 1870-1, the Bogos, a small people of from 18,000 to 20,000 souls, whose chief town is Kerên, the headquarters of the Catholic missions of the apostolic vicarship of Abyssinia (the Bogos are Catholic Christians of the Ethiopian rite), placed themselves under the Protectoratè of France: but in 1872, Egypt occupied their country, as well as that of several other tribes on the Abyssinian frontier, in order to unite to her province of Taka, the port of Massaua, which the Porte had just ceded to her. M. Ferdinand de Lesseps then made some observations on the assertions of M. R. du Caillaud. He did not believe that all the places referred to by the latter belonged to France, but maintained that Abyssinia ought not to be deprived of those places which were her property. He then gave a rapid sketch of the history of the Abyssinian people, which he has made the subject of an article which would appear on February 1st, in a review published in Paris, and would be followed by another on an excursion which M. de Lesseps made some time ago in the Soudan. M. de Lesseps took the opportunity while on the platform to suggest that, when names were given to new streets in Paris, those of geographers born in the capital should not be forgotten; among others, he mentioned the names of D'Anville, Delisle, de Vaugondy, Barbié du Bocage, &c.—A letter received from M. Wagner, French Consul at Buenos Ayres, was then read, dated November 23rd, announcing the arrival at Asuncion of the Bolivian expedition. M. Thouar, who was pursuing the search for the remains of the Crevaux Mission, accompanied this mission; the skull of Dr. Crevaux was stated to have been found fixed to a tree and sent to Tupiza. This journey is a first and very important step towards the solution of the problem as to the communications of Bolivia with the east by means

of the great rivers of the Atlantic slope. The Pilcomayo appears to be navigable, but it is necessary to await the publication of the results of the journey before accepting this as a fact. It is to be hoped that, stimulated by the success of this enterprise, the Argentine Government will see its way clear at no distant date towards making an exploration of the Bermejo, and trying to establish, either by water or railroad, a route for the transit of goods between Bolivia and Europe, and at the same time open up to civilisation a vast tract of country where districts of unusual fertility are undoubtedly to be met with. Since receiving this letter, it was stated that one had been received from M. Thouar himself, announcing his arrival at Buenos Ayres, after having traversed Northern Chaco along the banks of the Pilcomayo. As regards the expedition itself, while waiting for the details which M. Thouar in person will give to the Society on his return, the General Secretary read to the meeting the information on the subject contained in the *Diario* of Buenos Ayres (7th December 1883).—In conclusion, a communication was made by M. Gustave le Bon on the ancient empire of the Arabs. M. le Bon is the author of an important work published at the commencement of the present year, entitled 'La Civilisation des Arabes' (Paris: F. Didot, 1884, 1 vol. 8vo.). The communication made by M. le Bon will be inserted in the quarterly *Bulletin*.—As the meeting was on the point of closing, the Chairman announced that, according to news just received concerning M. de Brazza, and dated from Landana, December 11th, the traveller had got beyond Bolobo, the station established by Stanley, which had been recently burnt down. M. de Brazza was proceeding down river to Brazzaville, and was settling himself to restore the kingship of Makoko.

— February 1st, 1884: M. BOUQUET DE LA GRYE, President of the Central Commission, in the Chair.—The Chairman opened the meeting with the announcement of some sad news. He stated that M. Richard Cortambert, one of the most active members of the Society, the son of an industrious geographer and himself a geographer, had just died at Hyères, after a protracted illness, at the age of 48. The deceased when very young gave himself assiduously to the study of geography. Walking in the footsteps of his father, he had composed numerous works for the young, had been his father's colleague at the Geographical Section of the National Library at Paris, and had continued the courses for the instruction of young ladies which his father used to direct. At the time of his death he was correcting the last proof sheets of the first volume of a great work he had undertaken, entitled, 'Nouvelle Histoire des Voyages et des grandes Découvertes géographiques,' which was to be completed in four volumes. The first was devoted to America and the North Pole, and was appearing in weekly parts. The late M. R. Cortambert was Honorary Secretary of the Society, to which he had belonged for twenty-six years. The Chairman then announced the death of General Humphreys, head of the engineering profession in the United States, to whom he said we were indebted principally for the works on the embanking of the Mississippi. General Humphreys had been a foreign corresponding member of the Society since 1875. The Chairman then intimated that M. Raffray, French Consul at Tamatave, was present at the meeting, and expressed a hope that he would shortly make some communication (entirely non-political) upon the island of Madagascar. When the Chairman had made these various announcements, he called upon M. Dutreuil du Rhins, representative of De Brazza's mission at Paris, to address the meeting. M. du Rhins stated that about five o'clock on that evening he had received a despatch from Africa, putting him on his guard against the false reports which would be, and in fact were, spread abroad, with the view of prejudicing the demand for credit then being submitted to the Chamber of Deputies, in favour of the French Mission in West Africa, under the direction of M. de Brazza. The evening papers announced the death of the French explorer, but

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M. du Rhins did not think that any reliance should be placed on this news.—M. V. A. Maltebrun presented to the Society the documents which he had been a long time collecting, with a view of preparing a work on the biography of French cartographers from the earliest times down to the present day. M. Maltebrun mentions the names of these first cartographers: Jean Fernel, physician to Henri II., who measured an arc of meridian by a very ingenious process; Nicolas Nicolai, geographer of Henri III.; Jolivet, who, in 1570, was the first to publish a map of France, which is now preserved in the National Library.—M. Mizon, naval lieutenant, who had recently returned from the Congo, stated that he hoped during the first fortnight of the present month to complete the map of a part of the districts over which he had been travelling for the last three years. This map, scale 1:40,000, will be divided into three sheets; the first sheet will show the course of the Ogowé and the Passa, and also of the Ivindo as far as Franceville, together with the plateau which separates the last-named river from the Alima, between the rivers Likila and Ngambo. The second and third sheets will show the journey which M. Mizon accomplished at the end of last year from Franceville to the coast at Mayoumba. The result of this journey is that it is now possible to separate the basin of the Ogowé from that of the Kulu-Niari.—The Minister of Foreign Affairs forwarded to the Society a letter from M. A. Thouar, addressed to the French Consul at Asuncion, and dated November 17th. In this letter the explorer gives a rapid sketch of his journey of sixty-three days across north of Gran Chaco. The following results have been obtained from the observations which he made on his journey: (i.) the Piloombayo is navigable; (ii.) road communication could be easily made across the rich districts of the centre; (iii.) the Indians offer no obstacle to colonisation; the total amount of commercial transactions which might be made along this route would reach 700,000*l.* sterling (17 or 18 millions of francs) according to M. Thouar's calculations. Solicited from various quarters to publish the information which he committed to writing during his journey, M. Thouar firmly refuses to do so, before obtaining substantial securities from the Governments of Paraguay and Bolivia in the interests of French commerce. Since receiving this letter the Chairman stated that M. Thouar had happily effected his return to France, and that on the following day, as the traveller was expected to arrive in Paris, a deputation from the Society would be at the Orleans Station to welcome him on his arrival.—A communication dated 15th November was received through the Minister of Foreign Affairs, from M. de Pourtalès, French Consul at Batavia, upon the ravages made in the Sunda Straits by the eruption of the volcano of Krakatau. From this more accurate information it appears that the island of Sebesie or Duer van den Weg (?), which has been reported as having been split up into five portions, is intact. This error has arisen from the fact that the island in question was formerly covered with a luxuriant vegetation, but the tidal waves having destroyed everything the skeleton of the island appears under its true form, and ships passing it from a distance thought it was broken in several pieces. With regard to the volcano itself, its crater has disappeared under the water, and at this spot the sounding lead now shows a depth of about 80 fathoms. The tidal waves, which made such ravages on the coasts of the strait, were produced, as is now generally agreed, by the following action: the crater absorbed an immense volume of water from the sea, the water was then thrown out again in gases and vapours formed by the contact of the water with igneous matter. On the other hand, the Island of Verlaten has been doubled as regards its area. The Islands of Steers and Calmeyer appear as new formations, and the same result appears throughout the shoal on which they are situated, as well as the neighbouring reefs. The Governor-General, who went to visit the scene of the catastrophe, told the French Consul that the exact number of the victims

would never be known, as the natives did not give the total number of the members of their families in the census. However, the Consul had it from the Governor's own lips that already the disappearance of more than 38,000 persons had been recorded and verified. The total amount of the subscriptions raised in aid of the sufferers had reached 92,000*l.* sterling (2,300,000 francs).—M. Alfred Bardey, a member of the Society, forwarded from Africa a report, which M. Rimbaud, agent of the commercial house of Mazeran, Bardey et Cie., at Harar, had furnished on the subject of Ogadine, the name given to a central place of tribes of Somali origin as well as to the country which these tribes occupy. This territory is generally defined on the maps as situated between the Somali tribes of the Habr-Gerhadjis, Doulbahantes, Midjertins and Hawias on the north, east, and south; while on the west, Ogadine borders on the Eunyas (Gallas shepherds) as far as the river Webbe, which separates it from the great Oromon tribe of the Arouissis. The general aspect of the country is that of a steppe covered with long grass, but with stony gaps. The trees, at least in the districts explored by M. Rimbaud and his companions, are those of the Somali deserts, mimosas, gum-trees, &c. However, on nearing the Webbe, the inhabitants lead a more settled life and devote themselves to agriculture. But the shepherds of Ogadine, like the rest of the shepherds of this country, are always at war among themselves or with their neighbours. They are fanatical Mussulmans; each encampment has its iman, who chants the prayer at prescribed hours. Extempore poets, who possess a knowledge of the Koran and the Arab scriptures, are found in every tribe.—In conclusion, a paper was read by M. Louis Simonin on Australia, its material progress and the development of English emigration on this continent (vide quarterly *Bulletin*).

Imperial Geographical Society of St. Petersburg.—Annual General Meeting, January 30th, 1884.—The Secretary read a report on the proceedings of the Society during the past year. Amongst various scientific expeditions undertaken the first place was given to that of Col. Prejevalsky, who recently left Kiakhta on his way to Tibet, hoping this time to reach the sources of the Yellow River. The gallant explorer would endeavour this summer to penetrate to Sikkim, and if this proves impracticable he will revisit Zaisan and Lake Issikul. The expense of fitting out the expedition was estimated at 43,580 roubles, and as this sum was far beyond its means, the Society petitioned the Emperor for State assistance, whereupon His Majesty ordered the requisite grant to be made. The result is that Col. Prejevalsky's present expedition is better equipped than any previous one sent out by the Society. Another well-known Russian explorer, M. Potanin, continues his ethnographical researches in the Chinese province of Kan-su, which presents rich materials in this branch of science owing to the mixed races by which it is inhabited. M. Potanin is accompanied by M. Berezovsky, a topographer, and M. Skossi; the cost of the expedition being in great part defrayed by M. Sukatchef. In regard to the International Polar stations, it was stated that the Novaya Zemlya expedition having completed its observations, had returned to St. Petersburg, where the results of its labours would be published by January 1st, 1885. The collections in the departments of zoology and botany were especially rich. Dr. Grinevitsky's explorations of Novaya Zemlya, of which an account had been given in the last number of the Society's *Izvestia*, might also be mentioned in this connection. As to the Lena station, the members of that expedition had been unable to return at the appointed time, and the Emperor, at the request of the Society, had ordered a further grant to defray the cost of its prolonged stay in North Siberia. In the south (the report stated), Dr. Regel continued his explorations in the Pamir; M. Adrianof had made an excursion to Kuznetsky-Alatau; and M. Malakhof was engaged in digging-out historical treasures in the Caucasus. Amongst the Society's publications in the course of the

year, the most important was the fine edition of Col. Prejevalsky's third journey—to Tibet. The library, according to a census just completed, contained 44,362 vols., of which 21,680 were periodicals. From a financial point of view the past year had been particularly favourable. The expenditure amounted to 116,451 roubles, of which 27,250 roubles were spent on publications and 77,194 roubles on expeditions; the greater part of this very considerable sum (116,451 roubles) being due to the generosity of the Government and of private persons.—After the reading of the report Prof. Mushketof, enumerating the distinguished services of M. Severtsof in the field of Central Asian research, announced amidst much enthusiasm that the indefatigable explorer had been awarded the Constantine medal by the Council of the Society. M. Severtsof has devoted twenty-six years to geographical labours in Central Asia, during which he has made many important contributions to our knowledge of little-known countries, his discoveries in orography being specially valuable. His last expedition was to the Pamir and Ferghana in 1877-78.—The Lütke medal was awarded to M. Wild, of the Meteorological Observatory in St. Petersburg; the Society's small gold medal to M. Lessar, for his well-known explorations in the Trans-Caspian region, and to M. Adrianof, for his journey to the Altai and beyond Sayan in 1881, and for his recent expedition to Kuznetsky-Alatau.—At a previous ordinary meeting (in December) it was announced that Dr. Fritsche, director of the Pekin Observatory, had made another important journey through Manchuria to Blagovestchinsk, on the river Amur, in the course of which he had taken no less than 62 magnetic observations.

Geographical Society of Stockholm.—December 14th, 1883: Dr. O. MONTZLIUS, the President, in the Chair.—The Secretary read the report of the Society for the past year, and laid the estimated ordinary expenditure for 1884 before the meeting, which was approved. The Council for the ensuing year was next elected, Consul-General N. Elfving being chosen as President. The Secretary, M. E. W. Dahlgren, was re-elected.—Miss Kornelia Pålman then exhibited some costumes and ethnographical objects brought by Nordenskiöld from Greenland. They were of the highest interest to science, as they belonged to natives of East Greenland, who had sold them to the Danes in the colonies on the south coast, where they came to trade. The costumes were, therefore, entirely original, showing the true style of dress of the Greenlander before it was influenced by European civilisation.—The Secretary, Dr. Dahlgren, next lectured on the literature of Japan with reference to the new work published by Nordenskiöld, 'Catalogue de la Bibliothèque Japonaise.' The speaker referred to the circumstance that Nordenskiöld had, when returning from the *Vega* Expedition, sojourned in Japan, and that his attention had been drawn to the very rich literature of that country prior to European influence. He had decided to collect and bring home a Japanese library. The collection, now in the Royal Library, numbered 1050 works, between 4000 and 5000 volumes. The catalogue had, at the expense of M. Oscar Dickson, been printed in Paris, under the immediate supervision of M. Léon de Rosny, professor at the *École Spéciale des Langues Orientales*. The speaker, in giving an account of the various branches of Japanese literature, stated that nearly all works of any prominence were to be found in the Nordenskiöld collection, which therefore formed a complete material for the study of Japanese literature and culture.

— January 18th, 1884: M. N. ELFWING, President, in the Chair.—Professor Hildebrand read a paper on the earliest Indo-European races. He said it was believed that Asia was the cradle of the Indo-European races, and some *savants* had begun by philological comparisons to construct the older and original language, and thereby obtain an idea of the culture of the pre-historic people. M. Pictet, the author of 'Les Origines Ariennes,' a native of Switzerland, had done most in this respect; but

he had, in the speaker's opinion, gone a little too far in his attempt at proving that the Aryan race was superior in every respect. He (M. Pictet) claimed that the Indo-Europeans were distinguished by a very high degree of culture, that they knew the metals and the art of working them, that they were, in fact, a superior race. This theory, being based on the languages, did not, however, hold good, and a lower estimate of these nations must be taken both as regards the perfection of their language and their culture. Two works had recently appeared which dealt with this question in its entirety, one by Dr. Schrader, of Jena, and the other by Prof. Penks, of Vienna. It was on the first-named work in particular that the speaker based his lecture. One of the results of M. Pictet's theory, that the Indo-Europeans knew the treatment of metals before they emigrated from their Asiatic home, would be that we must conclude the culture of the stone age in Europe not to be of Indo-European origin; the theory had therefore been advanced that the neolithic race had been extirpated by the Indo-Europeans. This race had been called the Turanian, and the only remnants of the same were said to be the Basques, the Finns, and the Lapps. Dr. Schrader, who had given this point, viz. the knowledge the Indo-Europeans had of metals, particular attention, had arrived at a result differing from M. Pictet's view. He proved that gold was not known to the Indo-Europeans. The various denominations of this metal in the Indo-European languages, as, for instance, the Greek *chryso*, the Latin *aurum* (pronounced earlier *ausum*) and the Germanic *guld*, had no relation to each other. The same was the case with silver; and Dr. Schrader had come to the same conclusion as previous archaeologists, viz. that the latter metal was discovered after gold. As regards copper, however, it was evident that this metal was known to the original race, as its denomination in the various languages (Latin *æs*, Greek *air*, Sanskrit *aias*) showed a close relationship. But it was obvious that the acquaintance with copper alone could not raise a race from the degree of culture indicated by the stone age, for this metal cannot be used for weapons and tools in the same way as, for instance, bronze, and that the latter was not known was proved by the fact that the various languages had entirely different words for tin as well as for "casting" and "hammering" (forging)—processes by which such objects were produced from this metal. This linguistic research led Dr. Schrader to conclude that the Indo-Europeans had only reached the degree of culture indicated by the stone age, that they were chiefly shepherds, but also carried on a primitive form of agriculture, that they knew the arts of spinning and weaving, as well as building. From the circumstance that the words relating to kinship were similar it might be concluded that the sense of family relationship was greatly developed among this race, and that it was governed by chieftains with patriarchal authority. As regards religion, it was certain that this race were observant of the phenomena of nature and revered or feared them, but we had no knowledge of their religious cultus. If a comparative culture be sought, it would be found among the lacustrine dwellers of Switzerland, and this again led one to ask whether it was necessary to refer the home of the Indo-Europeans to Asia? Several earlier ethnologists had most emphatically asserted that the Indo-Europeans had come from some place in Europe, but various suggestions had been made as to where this home had been. Dr. Schrader believed, after exhaustive inquiry, that it had been situated in East-Europe, chiefly West-Russia and Galicia, while Professor Penks went further, asserting that the cradle of the Indo-European race was Scandinavia. Philology alone could, however, not solve these problems, but must be accompanied by comparative archaeology. It would only be after these two branches of science had gathered a more complete body of facts that light could be thrown on the important question of the origin and culture of the Indo-Europeans.—The next to address the meeting was Baron Nordenskiöld, who spoke on the recent remarkable

sunsets and sunrises. He said that the purple glow seen differed from the ordinary aurora by its greater intensity and by the circumstance that a considerable time elapsed before it attained the greatest brilliancy before sunrise or after sunset. It was seen most probably early last summer, and the exact time of its first appearance was of great consequence, as it had been attributed to the volcanic eruption in the Sunda Straits. Immediately after this occurrence coloured suns and moons were seen in Japan and India, but it was only in November last that the red glow attracted general attention. The place in Sweden where it was first seen was Varberg, where on November 27th the glow was so brilliant that a ship was believed to be on fire in the Cattegat. By calculating the time elapsing between sunset and the appearance of the phenomenon, the height of the layer of air in which it was caused had been estimated, viz. in Magdeburg at 50 English minutes or 50 miles, and at other places at from 18 to 20 minutes. As to the cause of the phenomenon, some had attributed it to an intenser aurora, others to the presence of ice-crystals in the highest layers of air; but as to the latter explanation, the Baron said that this theory could not hold good, as the phenomenon was not accompanied by halos and mock-suns as was the case in the Arctic regions. It had so been attributed to electricity in the air, but if this was the case the glow would have been like the aurora borealis, self-shining, not reflected. This he had proved not to be the case, by examining it with the polariscope. The glow was everywhere strongly polarised, with the exception of a small area just in the spot where the sun set or rose. All physicists now agreed that the phenomenon was caused by minute dust in the upper atmosphere. How this had got there could be explained in two ways. Firstly, it was stated to have been projected by the volcanoes in the Straits of Sunda; but if this was the case the glow would have been seen in its developed form earlier than was the case, while the attraction of the earth would have caused it to have fallen down in a short space of time. He (the speaker) was of opinion that the dust was caused by a cosmic dust-cloud, for which there were several reasons as, for instance, that the phenomenon's first appearance was synchronic with the passage of the earth across the orbit of Biela's comet. This comet was, as was generally known, in a state of dissolution, and the cause of the well-known November meteor streams. The dust lately collected from snow in Sweden confirmed his theory. Some had been collected by Colonel Klercker near Stockholm, which was found to contain cobalt and most probably also nickel, both elements rare on the surface of the earth but always found in meteors. This point could not, however, be conclusively decided unless some dust was collected in a place where there was no possibility of its containing terrestrial matter. In order to decide this important question the Academy of Sciences had voted a sum for the prosecution of such researches in the north of Sweden.—Professor Gyldén (Astronomer Royal of Sweden), replying to this address, said that, whilst he did not deny that the phenomenon was caused by cosmic dust, he did not believe that it could be caused by the earth passing through a cosmic cloud. In that case the glow would have been greater in the morning than in the evening, which had not been shown from observations. The dust could, therefore, not have come direct from space; but it was not unlikely that such a cloud-dust might be kept for some time suspended in the atmosphere. As to the height of the glow, the observations he had made were coincident with those at Magdeburg, viz. that it was about 50 miles above the surface of the earth. In conclusion, Baron Nordenskiöld remarked that he thought that the observations were not complete enough to enable us to say with certainty whether the phenomenon was stronger in the evening or in the morning. He read a letter from a gentleman residing at San Fernando in the Chilian Cordilleras, who stated the glow had been observed there before November 11th, and was accompanied by the fall of a red dust.

Geographical Society of Copenhagen.—The third meeting of the Session 1883-4 was held in honour of the *Djmphna* Expedition, under Lieut. Hovgaard; the King, Crown Prince and Crown Princess of Denmark being present, as well as the Princes Wilhelm and Hans. The crew of the *Djmphna* were also invited. The Vice-President of the Society, Admiral Wrisberg, opened the meeting by welcoming Lieut. Hovgaard back. He said that, although the Society had contributed but a small sum towards the expedition, they had followed his voyage with the greatest interest. If it had not succeeded in its principal object it had increased our knowledge, geographical and physical, of the Arctic Seas, and had been the means of saving the Dutch Meteorological Expedition.—Lieut. Hovgaard then gave the following account of his voyage:—"The *Djmphna* left Vardö in Norway, August 3rd, 1882, and although the temperature of the sea on the 7th was 5° C. ice was encountered off Mejdusharskii Island, and there occurred soon after a very heavy thunderstorm in the night, a phenomenon remarkable for these waters. In September 1883 several were experienced just east of the Waigats Island. Two days were spent in scientific researches on the island by the naturalists, Drs. Borch and Holm. The rest of August was passed in attempting to get into the Kara Sea, which was everywhere barred by heavy ice. At last the Jugor Strait was reached. Of scientific observations the meteorological will be of the most value. Fifteen excursions to Novaya Zemlya were very fruitful, some 120 plants being collected along with 100 specimens of the lower flora of the tundra and the slate rocks, which have given sufficient materials for ascertaining the flora of the southern part of this island. The plants were all dried, while some specimens were placed in spirits for minuter study. The fauna of the island consists of bears, foxes, and reindeer; they did not, however, appear in any number, but lemmings were very plentiful. A few birds were seen, and dredgings effected from a boat. The progress was very slow on account of ice, and the currents puzzling in many places. Chaborova Harbour was reached September 8th, where the Samoyede fishermen, who come here to fish, stated that they had never experienced such a severe year. Going south along the coast of the mainland some dredgings were obtained and botanical excursions made to the Sokoly Nos. On September 17th open water was found east of Mjasnoi Island in a channel by the coast. In 63° N. lat. a small river falls into the Kara Sea, which causes the drift ice to leave the coast there. On September 20th the *Varna* was met, beset in the ice, with the Dutch Meteorological Expedition on board, in 69° 42' N. lat. and 64° 45' E. long. In a couple of days both vessels were frozen in. The ice pressure was very severe and dangerous, and the temperature began to fall. On Oct. 1st it was - 12° C.; the average temperature of the month was - 11°, while on the 30th it fell to - 31° C. It was, however, remarkable that the weather was fine throughout, without the least wind, a most agreeable change from the wintering of the *Vega*, during which the most unpleasant wind blew daily. During October and November both vessels drifted rapidly to the north and north-west, in great danger night and day from the ice which seemed in constant motion. There were some magnificent displays of the aurora borealis, which were particularly vivid and intense about November 12th. On that day the sun set at 3 P.M. On the 21st it rose at 11 A.M. and artificial light was necessary at 2 P.M. The sun was, however, last seen on the 20th, the weather being cloudy, but it should have been visible as late as the 22nd. In November the vessel drifted backwards and forwards between 70° 10' and 70° 30' N. lat. and 63° and 65° E. long. The end of November and early December were very fine, the ice being quiet, with the most brilliant moonlight nights. The temperature was between - 20° and - 30° C., and at times fell to - 40°. On a few days it rose to thawing point. At the end of December the vessel had very nearly reached 71° N. lat. by drifting, and was only about 20 nautical

miles off the coast of Yalmal. In January the *Varna* became uninhabitable, and the Dutch Expedition and the crew of that ship had to be taken on board the *Dijmphna*. During the following two months she drifted between the 70° and 71° of N. lat. The days now began to lengthen, but the first half of January was very dark, there being no moon. The sun rose nearer and nearer to the horizon, and on January 22nd, after two months' absence, the rim rose above the same. Now the temperature began to fall, and on the 22nd the quicksilver froze for the first time during the winter, and throughout the following week it remained between - 40 and 46°·8 C. Sounds became remarkably audible in the thin air. When the ice again began to move, about Christmas, the journals and all the objects of natural history were collected and placed in tin boxes on deck in order to save them if the *Dijmphna* should founder. While everything was in readiness for a retreat on Obdorsk, the first few months of the spring of this year were spent in dredging and studying the air and the ice, which was possible through the drifting of the ship. In June the engines were cleared and made ready to start, and it was arranged with Dr. Snellen that the Dutch Expedition should go ashore on the Yalmal coast, to continue their scientific researches until September, when Lieut. Hovgaard would again take them on board after a cruise in the Kara Sea. In June and July the snow and the ice began to disappear with remarkable rapidity. It was not the sun or the rain and the fog which seemed to eat it away, but when drifting quickly for only a few hours the measurements showed that several inches had disappeared. He recollected that when wintering in the *Vega* in 1879, when lying near the shore, he was surprised at the rapidity with which the ice disappeared, but that was as nothing compared to the present occasion, in spite of its being four degrees further north and in the middle of the ice-covered Kara Sea. Even when cold weather set-in in August the erosion was very great, while it began a month earlier than near Bering Strait. In July the *Dijmphna* began to drift towards the Kara Gate, and on July 24th the *Varna* went down alongside her. On August 1st the Dutch party started on their land journey, and on the following day the *Dijmphna* unexpectedly got free. The crank shaft, however, breaking, she was towed, sailed, and warped as far as Bolwanofsky Noss on Waigats Island. It was exactly a year since land had been seen. On September 26th she was out of the Kara Gate and in open water, and beating down towards Norway; she anchored at Vardö on October 10th.—In conclusion, the speaker stated that a most valuable chart had been made of the Kara Sea, as soundings had constantly been taken whilst drifting in the ice.

NEW BOOKS.

(By E. C. RYE, *Librarian* R.G.S.)

EUROPE.

About, Edmond.—De Pontoise à Stamboul. Paris (Hachette): 1884, 12mo., pp. 285. (*Williams & Norgate*: price 3s.)

Unconnected essays, dating from 1867 to 1883, scarcely of a geographical character.

Leger, Louis.—La Save, Le Danube, et Le Balkan. Voyage chez les Slovènes, les Croates, les Serbes, et les Bulgares. Paris (Plon): 1884, 12mo., pp. iii. and 279. (*Williams & Norgate*: price 2s. 6d.)

A collected republication of the author's impressions during his travels among the Southern Slaves in the summer of 1882, of less geographical than political interest.

Nissen, Heinrich.—*Italische Landeskunde. Erster Band. Land und Leute.* Berlin (Weidmannsche Buchhandlung): 1883, 8vo., pp. viii. and 566. (*Williams & Norgate*: price 8s.)

The author's object is to describe Italy in the time of the Romans, and he devotes this first volume of his work to a general description of the then existing physical features of the land, proposing to give the cities and towns in detail in a second one. After upwards of 50 pages referring to the sources of information, he discusses in separate chapters the name and boundaries, seas, Alps, Po district, Apennines, volcanic phenomena, Apennine rivers, islands, climate, vegetation, and ethnological races of ancient Italy. A good index and copious notes materially add to the value of this work.

ASIA.

Cotteau, Edmond.—*Un Touriste dans l'Extrême Orient. Japon, Chine, Indo-Chine, et Tonkin.* Paris (Hachette): 1884, 12mo., pp. 448 [no index], maps and illustrations. (*Williams & Norgate*: price 3s. 6d.)

The author's wanderings occupied from August 1881 to January 1882; he was charged by the French Minister of Instruction with a scientific mission in Siberia and Japan. From Vladivostok he crossed to Yokohama, thence visiting Tokio, Nikko, Fusi, Kioto, and Kobe, and after touching at Shanghai, Peking, Hankow, and Hongkong, spending a short time at Haiphong, Hanoi, Saigon, and Angkor, returning home viâ Singapore.

Saint-Pol Lias, X. Brau de.—*Ile de Sumatra. Chez les Atchés. Lohong.* Paris (Plon): 1884, 12mo., pp. xxxv. and 274, map and illustrations. (*Dulau*: price 3s. 6d.)

The author, already known for his active interest in French colonisation and his sketches of Deli and Perak, here gives his personal experiences (apparently at the end of 1880 and beginning of 1881) in Acheen, which in the absence of available literature on this little-known northern corner of Sumatra, will be found of interest in connection with the long protracted operations of the Dutch (a slight preliminary account of which is given). He describes at some length the present condition of Olehleh, the port of Great Acheen ("Atché Beçar"), which is connected by a railroad with the capital Kotta Rajah, and gives a detailed account of the chief points of interest in the latter, such as the Kraton (site of the ancient fortress in which the sultans lived, and now converted into a Dutch military residency), the European, Chinese, and native quarters, &c. M. de St.-Pol Lias passed some five months in the capital, but had to leave it on the occasion of the murder of two French officers in Acheen, returning in time to see the largest of the periodical inundations ever witnessed by a European, of which he gives particulars and illustrations. He appears to have established friendly relations with the Toukou Lohong, the chief of one of the three great "Sagui" or divisions of Great Acheen, and well disposed towards the Dutch, in whose company he travelled in a native boat southwards along the west coast of Acheen to Paroh, and, finally, to Ketapang on the Lohong river, the residence of the chief. Here he made some stay, obtaining from his host various historical particulars, noting local industries and habits, and making excursions (in one of which he ascended Batang Ou) a little north of the fifth northern parallel, apparently with the view of selecting a concession for coffee planting, &c., and ultimately founding a French colony, the preliminary step for which, in the shape of a contract for grant of lands, was secured during this visit. At pages 137-140 will be found a slight Achinese vocabulary and a table of numerals.

Various rough illustrations from photographs are given. The map shows the Lohong river and adjoining country on the scale of 1:50,000, from compass bearings by the author during his excursions; it gives contours of about 100 metres. An inset (scale 1:150,000) dated May 1880, to which no reference is made in the text, shows in like manner the river of Klouat, on which Pulo, Kambing is situated, at the extreme south of Western Acheen. This represents the Asahan of older Dutch maps, running through Kaloeat.

Ujfalvy, Karl Eugen von.—Aus dem westlichen Himalaja. Erlebnisse und Forschungen. Leipzig (Brockhaus): 1884, 8vo., pp. xxvi. & 330, maps, plates, and tables. (*Dulau & Co.*: price 18s.)

The author's two former journeys in the Siberian steppes and the valleys of Central Asia, resulting in the collection of much material of anthropological, ethnological, and archaeological interest, induced the desire to explore the upper valleys of the Amu-Daria, Indus, and Jhelum with similar objects, and more especially with the idea of comparing the Aryans living below the Pamir with their more northern brethren of the valleys of the Serafschan and upper Syr-Daria. In this project he was only partially successful, his operations being confined to Kashmir and Baltistan, in which he found ample material for valuable collections and observations. Starting from Simla in May 1881, he entered Kulu, visiting Sultanpur, Baijnath, Dharmasala, and Kangra, and thence crossing into Kashmir through Chamba. Srinagar was reached by Badrawar, Islamabad, and the upper Jhelum; and after visiting the Wular Lake, M. Ujfalvy struck north-east to Iakardu on the upper Indus, crossing Baltistan to the Mustagh Pass by Shigar, and working up the Indus Valley to Kargil and Dras, and so back to Srinagar. Leaving Kashmir, he then reached Muzaffarabad in the Hazara district, spending some days in the valley of the Nainsukh (or Kunhar), where he met various natives of Chilas and Chitral, finally returning by Mari, Rawal-Pindi, and Lahore, and reaching Europe after nine months' travel. In this work, purely geographical allusions are merely incidentally given, the author's attention being theoretically devoted to racial distributions and affinities, and speculation on primitive man in Central Asia, and practically to the accumulation of ancient art relics (in which he was very successful). The works of Biddulph, Umlauf, Leitner, and other authorities on the people of the North-western Himalaya are largely utilised. Twenty separate illustrations and over 100 woodcuts illustrate the narrative, and four anthropometrical tables are given of Ladakis, Dards, and Baltis, with coloured maps of the ethnography of Central Asia, the geographical distribution of Islamism and Buddhism, the ethnography of Baltistan, and the distribution of polyandry in Hindostan and Tibet, and an ethnographical and political map (scale, 1 : 2,500,000) of Kafiristan, Chitral, Dardistan, and the Indian Kohistan.

Walker, [Lieut.-General] J. T.—Synopsis of the Results of the operations of the Great Trigonometrical Survey of India. Vol. xiv. Descriptions and Co-ordinates of the principal and secondary Stations and other fixed points of the Budhon Meridional Series, or Series J of the North-East Quadrilateral. By Lieut.-General J. T. Walker, C.B., R.E., F.R.S., &c., Surveyor-General of India, and Superintendent of the Trigonometrical Survey, and his assistants. Dehra Dun (Office of the Survey): 1883, 4to., pp. i.-ix., i.-xvi., 1-36, maps.

——— Vol. xv. The like of the Rangir Meridional Series, or Series K of the North-East Quadrilateral: pp. i.-ix., i.-xvii., 1-49, maps.

——— Vol. xvi. The like of the Amua Meridional Series, or Series L, and the Karara Meridional Series, or Series M of the North-East Quadrilateral: pp. i.-x., i.-xiii., 1-20; i.-x., 1-36, maps.

The Budhon Series is the westernmost of all the meridional chains of triangles termed the North-East Quadrilateral (which embraces the area within the meridians of 78° and 92° and the parallels of 23° and 30°) and has been reduced by itself in consequence of its slight connection with the two great series (the Great Arc and Calcutta Longitudinal), which enter the periphery of that quadrilateral. The Rangir, Amua, and Karara series follow immediately on its eastern side. As in preceding volumes, a constant correction of probably -2' 30" is suggested in the values of longitude given, an important point, as the chief general use of these volumes lies in the numerous exact positions.

AFRICA.

[Pigafetta.]—Le Congo. La Vériidique Description du Royaume Africain, appelé, tant par les Indigènes que par les Portugais, le Congo, telle qu'elle a été tirée récemment des Explorations d'Edouard Lopez, par Philippe Pigafetta, qui l'a mise en langue italienne. Traduite pour la première fois en français sur l'édition latine faite par les frères De Bry, en 1598, d'après les voyages portugais et notamment celui d'Edouard Lopez, en 1578, . . . par Léon Cahun. Bruxelles (Gay): 1883, 12mo., pp. 213, maps. (*Dulau*: price 8s.)

With the exception of a few introductory pages, and some slight explanatory notes, this is a French translation of Pigafetta's well-known account of Lopez's travels. The maps are reproduced in reduction, and a general map of the Congo region as now known is given on a small scale.

AMERICA.

Dutton, Clarence E. [United States Geological Survey. J. W. Powell, Director.] Tertiary History of the Grand Cañon District, with Atlas, by Clarence E. Dutton, Captain of Ordnance, U.S.A. Washington (Government Printing Office): 1882 [received 1884], 4to., pp. xiv. and 264, coloured plates, photographs, and full-page illustrations (42 in all). Atlas folio, 23 sheets, geological and topographical.

This magnificently illustrated and exceptionally interesting volume forms No. II. of the new scheme of Monographs of the United States Geological Survey, of which it is actually the first to be published (No. I., "The Precious Metals of the United States," by Clarence King, will appear "during the coming year"). It is stated that these Monographs are not for gratuitous distribution, but that they will be distributed in exchange for books needed in the library of the Survey, surplus copies being sold. The price is left blank in the present instance. The work is published, it will be noticed, under the Directorship of Major Powell (who succeeded Mr. Clarence King on the resignation of the latter in 1881), whose own memorable journey through the cañons of the Colorado river has, with his other explorations and geographical and geological surveys, caused his name to be especially associated with the region. Being prevented by pressure of official duties from completing this particular work, it has been left to his assistant and fellow-worker, Captain Dutton, who has already in like manner treated the kindred and adjoining district of the High Plateaus of Utah.

Captain Dutton's personal administrative Report of his topographical and other work is contained in pp. 5-10 of the Second Annual Report of the U.S. Geological Survey to the Secretary of the Interior 1880-81, by Major Powell, simultaneously published; and this is followed by a profusely illustrated paper on the Physical Geology of the Grand Cañon District by him, occupying pp. 47-166 of the same Report. The district, comprising an area of at least 13,000 square miles, is shown to be one of the most impressive and instructive in the world, owing to the vast scale on which the process of erosion has been carried on in it, and the unparalleled distinctness with which the causes, methods, and results of that great power are revealed.

The Monograph contains a brief account of the geography of the district, which is situated chiefly in north-western Arizona, having an extension northwards into Utah; its length from north-west to south-east is about 180 miles, and its width from north-east to south-west about 125 miles. The Colorado river of the West runs across its middle in a very tortuous course, through the Marble Cañon and Grand Cañon, which are not to be confounded with the vastly inferior so-called Grand Cañons of the Yellowstone and Arkansas. The southern side of the river has not been as yet thoroughly studied; but on the northern side six subdivisions (the "Terraces," followed by five distinct plateaus, called Sheavwits, Uinkaret, Kanab, Kaibab, and Paria, all parts of the main carboniferous platform) are recognised, of which the dividing lines are well marked. The Colorado river appears to have originated in very early tertiary time as the outlet of a great Eocene lake, and to have persisted in its course ever since, acting as the main

track along which the waste of the province has been carried to the Pacific. It is impossible to conclude even this short notice without congratulating the Executive of the United States Government upon the liberality of its expenditure on such documents as this (which are thereby converted from dry official returns into valuable scientific treatises), and upon its good fortune in the possession of survey officers of remarkable ability.

Peralta, Manuel M. de.—Costa Rica, Nicaragua, y Panamá en el Siglo XVI. : Su Historia y sus Límites según los Documentos del Archivo de Indias de Sevilla, del de Simancas, &c., recogidos y publicados con Notas y Aclaraciones históricas y geográficas. Madrid (Murillo) and Paris (Ferrer): 1883, 8vo., pp. xxiii. and 834, map. Price 50 pesetas = 2*l.* 1*s.* 8*d.*

Señor Peralta here gives a series of (certified) copies of documents hitherto unpublished, chiefly from the Indian Archives of Seville, bearing on expeditions, acts, and events, &c., in Nicaragua, Costa Rica, and Panama (especially in connection with the changes of boundaries), from Gil Gonzalez Dávila, 1524, to Fray Augustin de Ceballos, 1610—some 150 different documents being reproduced or extracted. These include the letter disproving a supposed piratical act of Sir Francis Drake, noticed in last year's 'Proceedings,' p. 407; and also a declaration dated 8 May 1579, referring to Drake's capture of a vessel in Costa Rican waters. In an appendix, nineteen other copies of extracts are given, containing much matter of geographical and topographical interest from the historical point of view, beginning with the occupation of the island of Chira by Pedrarias Dávila in 1526, and ending with the report of Perafan de Ribera, governor of Costa Rica, in 1571; these are accompanied by various explanatory notes and summaries of known information on the various points discussed.

A chronological table of the discoverers, conquerors, governors, presidents and other authorities, and bishops of Castilla del Oro, Nicaragua, and Costa Rica is given, from Columbus to 1600, with dates of foundations of cities and towns.

The map is a small modern one of Central America, by Perthes.

Tallenay, Jenny de.—Souvenirs du Venezuela. Notes de Voyage. Paris (Plon): 1884, 12mo., pp. 324, illustrations. (*Dulau*: price 4*s.*)

The authoress visited Venezuela with her husband in 1878, and gives a brightly written account of her experiences during somewhat lengthy excursions in various parts of the Republic. Some slight political and historical notes accompany her general description of the present aspects of the country. The illustrations appear to be original.

ARCTIC.

Nordenskiöld, A. E.—Vega-Expeditionenens Vetenskapliga Iakttagelser bearbetade af Deltagare i Resan och andra Forskare. Utgifna af A. E. Nordenskiöld. Tredje Bandet. Stockholm (F. & G. Beijer's Förlag): 1883, 8vo., pp. 529, pls. 1-44. Price 1*l.* 2*s.*

This third volume of the scientific results of the *Vega's* great voyage (see R.G.S. 'Proceedings,' 1882, p. 446, and 1883, p. 625, for two former volumes) contains four papers, viz.:—On the Seaweeds of the Arctic Sea, by F. R. Kjellman; the commencement of a review of the Arctic Sea-mollusks collected during the expedition (Part I., the Lamellibranchs), by W. Lecke; Diatoms collected during the expedition, by P. T. Cleve; and the Mites collected, by P. Kramer and C. J. Neuman. The illustrations are very numerous and well executed.

GENERAL.

Agenda 1884 avec Éphémérides Géographiques. Bruxelles (Institut National de Géographie): 1884, narrow oblong fo., pp. xxii., 365, and 18.

Besides the usual almanac information, this curious novelty contains a history of geography in the shape of brief entries of names, events, and dates, chronologically arranged, and divided under discoveries of the Portuguese,

Spaniards, Dutch, English in America, Australia, and Africa, Work in the Arctic and Antarctic regions, Navigation (including celebrated navigators), Colonisation, Land Voyages (including celebrated travellers), Commerce and Science, with various subdivisions. Historical political geography is also broadly treated in the same way. Notable geographical events are then given for each day in the year, with an alphabetical index of the names of the chief travellers accompanied by the dates of their greatest exploits.

Lambert, C. & S.—The Voyage of the *Wanderer*, from the Journals and Letters of C. and S. Lambert. Edited by Gerald Young. London (Macmillan): 1883, imp. 8vo., pp. xx. and 335 [no index], maps, coloured plates, and woodcuts. Price 25s.

The *Wanderer*, a three-masted scow schooner belonging to the Royal Yacht Squadron, started with her owner and his family on August 5, 1880, from Cowes, returning after a cruise round the world on July 19, 1882. Her course was to Lisbon, Madeira, the Canaries, Cape de Verdes, Gaboon, St. Helena, Bahia, Rio, Montevideo, Chupat, Magellan Straits, Valparaiso, Juan Fernandez, Coquimbo, the Marquesas, Society Islands, Rara Tonga, Tongatabu, Fiji, the Navigators, Sandwich Islands, Japan, Corea, Formosa, Hongkong, Singapore, Ceylon, and home by the Red Sea. This is shown on a Mercator's projection map, with insets of the Sandwich, Marquesas, Paumotu, Society and Fiji groups, also of Magellan Straits. Salient points of scenery, &c., are represented on the coloured plates, and the woodcuts are good. Abstracts of the log-book give meteorological data, &c.; and although the book has no pretension beyond a narrative of personal experiences, it contains much matter not only of genuine interest, but of a useful character in the less frequented localities.

NEW MAPS.

(By J. COLES, *Map Curator R.G.S.*)

EUROPE.

Anvers, Carte générale de la province—. Scale 1:80,000 or 1 geographical mile to an inch. Antwerp, Rouseaux, 1883. Price 3s. 6d. (*Dulau.*)

Central-Europa, Neue Uebersichtskarte von—, resp. der oesterreichisch-ungarischen Monarchie. Scale 1:750,000 or 10·3 geographical miles to an inch. Herausgegeben vom. k. k. militär-geograph. Institute, Wien. Price 2s. each sheet. (*Dulau.*)

The following sheets are just published:—A 3. Innsbruck, Trient, Basel, Zürich. A 4. Mailand, Genua, Bologna, Florenz. B 4. Pola, Zara, Comacchio. E. Wilna, Minsk, Grodno, Slonim.

Danmark, Befolkningskart over Kongeriget— den 1 Febr. 1880. Statist. Bureau, Kopenhagen, 1883. Price 1s. 2d. (*Dulau.*)

Europe, Carte murale de la—, par L. Bonnefont. Scale 1:5,210,000 or 71·3 geographical miles to an inch. Paris, Lanée. (*Dulau.*)

— par J. Gaultier. Scale 1:3,654,000 or 50 geographical miles to an inch. Paris, 4 sheets. (*Dulau.*)

France.—Carte de France, dressée par le Service Vicinal par ordre de M. le Ministre de l'Intérieur. Scale 1:100,000 or 1·3 geographical miles to an inch. Paris, Hachette et Cie. 1883. Sheets:—X.—12, Saint Lô; X.—13, Vire; XVI.—12, Pontoise; XVI.—14, Dourdan; XVII.—14, Melun; XXIII.—16, Nogent (Hte. Marne); XXV.—14, Lunéville. Price of each sheet, 7d. (*Dulau.*)

— Carte murale de la—, par L. Bonnefont. Scale 1:1,200,000 or 16·4 geographical miles to an inch. Paris, Lanée. (*Dulau.*)

Luxembourg.—Carte des chemins de fer et des Bassins Miniers de Longwy, Differdange, Belvaux et de Esch-Rumelange, Dudelange. Scale 1:20,000 or 3·6 inches to a geographical mile. Dressée par A. Kauffeld et E. de Muyser. 2 sheets. Price 10s. (*Dulau.*)

Sardaigne, Carte de la— en 1882, indiquant les villes principales, et les mines en exploitation et exploités depuis 1850, par L. Simonet. Paris. (*Dulau.*)

Westfalen, Schulwandkarte von—. Scale 1:200,000 or 2·7 geographical miles to an inch. J. L. Algermissen. 4 sheets. Chromolith. Lang, Metz, 1883. Price 6s. (*Dulau.*)

ORDNANCE SURVEY MAPS.

1-inch—General Maps:—

ENGLAND AND WALES: Sheet 258 (in outline), 1s.

6-inch—County Maps:—

ENGLAND AND WALES: **Buckinghamshire** (part of): Sheets 38, 42; 2s. 6d. each. Sheet 48 filled in with parts of sheets 43, 47 (Hertfordshire); 2s. 6d. **Glamorganshire** (part of): Sheet 7; 2s. 6d. **Hertfordshire** (part of): Sheet 32; 2s. **Bedfordshire** (part of): Quarter sheets, 8 S.E.; 11 N.W.; 13 S.W.; 15 S.E.; 16 N.W., 16 S.E.; 20 N.E.; 22 N.W.; 1s. each. **Cornwall** (part of): Quarter sheets, 12 N.W., 12 S.W.; 12A S.W.; 1s. each. **Derbyshire** (part of): Quarter sheets, 22 S.E.; 26 N.W. with contours; 1s. each. **Gloucestershire** (part of): Quarter sheets, 9 N.E., 9 S.E.; 10 N.W., 10 S.W.; 18 N.E. filled in with 60 N.E. (Worcestershire); 18 S.E.; 20 N.E., 20 S.E.; 23 S.E.; 24 N.W., 24 N.E.; 31 N.W., 31 S.W.; 34 S.E.; 35 N.W., 35 N.E., 35 S.W., 35 S.E.; 36 N.W.; 39 N.W.; 39 S.W.; 49 S.E.; 1s. each. **Norfolk** (part of): Quarter sheets, 36 S.W., 36 S.E.; 48 N.W., 48 N.E., 48 S.W., 48 S.E.; 59 N.W., 59 N.E.; 71 N.W., 71 N.E., 71 S.W., 71 S.E.; 83 N.W., 83 N.E., 83 S.W., 83 S.E.; 84 N.W.; 94 N.W., 94 N.E., 94 S.E.; 103 N.E.; 102 N.E. with 13 N.E. (co. Suffolk); 1s. each. **Northamptonshire** (part of): Quarter sheets, 60 S.W., 60 S.E.; 61 S.E.; 62 N.E.; 63 N.E., 63 S.W., 63 S.E.; 64 N.E.; 65 N.W.; 66 N.W., 66 N.E.; 67 N.W.; 1s. each. **Shropshire** (part of): Quarter sheets, 54 N.E.; 56 N.W.; 69 S.W., 71 S.W.; 73 N.E., 73 S.E.; 74 N.W.; 80 N.W.; 1s. each. **Staffordshire** (part of): Quarter sheets, 55 N.E.; 59 N.E. with 2 N.E. (Warwickshire); 1s. each. **Suffolk** (part of): Quarter sheets, 33 N.E.; 34 N.E.; 34 S.W.; 43 S.W. with 43 S.W. (Cambridgeshire); 51 S.W.; 69 N.E.; 1s. each.

25-inch—Parish Maps:—

ENGLAND: **Shropshire:** Smethcott, 8 sheets and Area Book. **Suffolk:** Coney Weston, 6 sh. Little Glemham, 8 sh. Marlesford, 7 sh.

Town Plans—Scale 1:500:—

ENGLAND: Biggleswade, 10 sheets. Ipswich, 10 sh. Newport (Monmouth), 29 sh.

ASIA.

Java, Kaart van—. Scale 1:100,000 or 1·3 geographical miles to an inch. Topographisch Bureau, S'Gravenhage. Madioen Residency, 4 sheets. Kedoe, 2 sheets. Pekalongan, 1 sheet. Soerakarta, 6 sheets. Kediri, 4 sheets. Rembang, 4 sheets. Batavia, 4 sheets. Banjoemaas, 3 sheets. Djokjakarta, 4 sheets. Bagelen, 4 sheets. (*Dulau.*)

— en Sumatra, Kaart van het Gedeelte— geteisterd door de vulkanische uitbarsting in 1833 op de schaal van 1:500,000 or 6·8 geographical miles to an inch.

Tsamengesteld volgens de laatste gegevens door den directeur der Topographische Inrichting C. A. Eckstein. Uitgegeven ten voordeele der Noodlijdenden bij de Gebroeders van Cleef, 1883. (*Stanford.*)

This map illustrates the effects of the volcanic eruption of Krakatoa which took place on the 27th August 1883. That portion of the island itself which was destroyed, as well as the changes in the soundings in the vicinity are indicated by red colouring and figures.

AFRICA.

Africa, A Language Map of—, specially prepared by E. G. Ravenstein, F.R.G.S., from original sources, to accompany 'Modern Languages of Africa,' by Robert Needham Cust. 1883. Scale 1 : 8,000,000 or 109·5 geographical miles to an inch. Stanford's Geographical Establishment, London.

Central Africa, Map of—, Scale 1 : 1,800,000 or 24·6 geographical miles to an inch. Published by the Baptist Missionary Society, London. On calico.

Cameroons District, Map of the—, showing stations of the Baptist Missionary Society. Scale 1 : 110,000 or 1·5 geographical miles to an inch. Published by the Baptist Missionary Society, London. On calico.

These maps are executed in a bold style, and are intended to illustrate lectures. All the Baptist Missionary stations are distinguished by being underlined with red.

Chartum, Originalkarte der Wüsten-Hügel im Nord-Westen von—, aufgenommen und gezeichnet von Juan Maria Schuver, 21-25 März 1883. Scale 1 : 250,000 or 3·4 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1884, Taf. 3. Justus Perthes, Gotha. (*Dulau.*)

Lydenburg Gold Fields, Map of the—, S. A. Republic (Transvaal). Compiled from actual survey, Inspection Reports, and the best available information by R. Kelsey Loveday (Late Master and Registrar of the High Court of the Transvaal). Pretoria, 1883. Scale 1 : 233,600 or 3·2 geographical miles to an inch. Drawn and lithographed by Saul Solomon & Co., Cape Town.

This map, which is drawn on a much larger scale than any hitherto published, contains a large amount of statistical information with reference to the ownership and areas of the farms in the district. It also shows a portion of the proposed line of railway from Delagoa Bay to Pretoria.

AMERICA.

United States.—Northern Trans-continental Survey, Raphael Pumpelly, Director.

Agricultural Department: E. W. Hilgard, in charge of Soils. W. M. Canby, in charge of Forage Plants. Map Bulletin No. 1, containing the following:—1. Preliminary Agricultural Map of Yakima Region, Washington Ter., by E. W. Hilgard, 2 sheets, 1883. 2. Preliminary Agricultural Map of Colville Region, Washington Ter., by E. W. Hilgard, 1883. With letterpress.

Forest Department: C. J. Sargent in charge. Map Bulletin No. 1, containing the following:—Forest Map of the Yakima Region, Washington Ter.; showing the predominant elements of the Forest covering (W. Sheet). 1883.

All the above maps are on the scale of 1 : 254,000 or 3·4 geographical miles to an inch.

AUSTRALASIA.

Kimberley Distrikt, Der— in Nordwest Australien. Nach den Forschungen von John Forrest, C.M.G., Mai & Juni 1883. Scale 1 : 1,800,000 or 24·6 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1884, Taf. 2. Justus Perthes, Gotha, 1884. (*Dulau.*)

New South Wales.—Rainfall Map of New South Wales, 1882. Scale 1 : 2,000,000 or 27 geographical miles to an inch. 2. Curves showing the Heights of the Western Rivers of New South Wales during the year 1882, with a pamphlet entitled :—“ Results of Rain and River Observations made in New South Wales during 1882.” H. C. Russell, B.A., F.R.S., Government Astronomer for N.S.W. Sydney.

EDUCATIONAL.

British Empire, Johnston's Standard Map of the—. Johnston's Geographical Establishment, London, 1884. On rollers, varnished.

As the British Isles are not given in this map, its title is somewhat misleading. It is a map of the British Colonies and Possessions, which are given on twenty-nine inset maps of various scales, and from its style appears to have been published for use of elementary schools. The meridians and parallels are not graduated, but the latitude and longitude of one of the principal towns is given at the bottom of each map. The value of this information for educational purposes, must vary considerably; the positions of George Town on the Island of Ascension, Jamestown on St. Helena, or Stanley on the Falkland Islands, would convey a general idea of the geographical positions of any other part of those small islands to pupils, for the use of whom this map has been prepared; but the positions in latitude and longitude of Quebec, Sierra Leone, and Madras, would be of but little assistance to any one who wished to find Victoria V. I., Lagos, or Rangoon.

In the construction of this map it seems to have been considered necessary to use widely different scales in order that the smaller British Possessions might be brought into greater prominence. This, however, has the effect of conveying very erroneous ideas as to comparative magnitudes, and, except in the case of somewhat advanced pupils, a right comprehension of scale as affecting the areas of countries, is seldom met with, for though the scale of each map is given, and states plainly the number of miles to an inch, it would be a difficult matter to make a child comprehend that Cyprus is 800 times larger than Helgoland when they are placed close together on the map, and appear to be nearly the same size.

The populations are given, railways and submarine telegraphs are laid down. The maps are well drawn, showing the principal physical features, and the lettering is bold and legible. The following is a list of the maps and the scales on which they are drawn :—

Isle of Man, 4 miles to 1 inch.—Maltese Islands, 5 miles to 1 inch.—Hong Kong, 2 miles to 1 inch.—British Honduras, 35 miles to 1 inch.—Aden, Perim, Socotra, and Mushah Islands, 95 miles to 1 inch.—Falkland Islands, 45 miles to 1 inch.—Strait Settlements, 57 miles to 1 inch.—Cyprus, 24 miles to 1 inch.—British Guiana, 78 miles to 1 inch.—Helgoland, 1 mile to 5 inches.—India, 140 miles to 1 inch.—British North America, 150 miles to 1 inch.—Australia, 130 miles to 1 inch.—South Africa, 57 miles to 1 inch.—West Africa, 150 miles to 1 inch.—West India Islands, 130 miles to 1 inch.—New Zealand, 65 miles to 1 inch.—Gibraltar, 1 mile to 2½ inches.—Bermuda Islands, 1½ miles to 1 inch.—Fiji Islands, 30 miles to 1 inch.—Tasmania, 45 miles to 1 inch.—North Borneo, 50 miles to 1 inch.—St. Helena, 2½ miles to 1 inch.—Channel Islands, 2½ miles to 1 inch.—Ascension, 2 miles to 1 inch.—Mauritius, 6½ miles to 1 inch.



TENIMBER ISLANDS
OR
TIMOR LAUT

Compiled from the latest information
With corrections by M. H. O. Forbes.

Scale of English Miles.
One Inch = 20 Miles

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UNIVERSITY

PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

My Recent Visit to the Congo.

By Major-General Sir F. J. GOLDSMID, C.B., K.C.S.I.

(Read at the Evening Meeting, February 11th, 1884.)

THOUGH it may be difficult at the present moment to draw the attention of Englishmen generally to any other portion of Africa than that comprising Egypt and the Soudan, there is no doubt that some acquaintance with its western coast, and the splendid river traversing and retraversing the Equator, in the heart of the vast Dark Continent, cannot be other than desirable to politicians as well as geographers. My personal experience has been too brief to enable me to enter, with any fulness, into a description of the interesting region to which the programme for this evening more especially points; but I have the satisfaction of knowing that the paper which will presently be read to you by my late associate Mr. Delmar Morgan will be of a more practical and comprehensive character than my own, and better fitted for the hearing and reading of the Fellows of this great Society. Indeed, it is only as a prelude to Mr. Delmar Morgan's account of his journey that I venture to submit these notes at all.

On return from a long sojourn in Egypt in May last year, I had almost made up my mind to do what I had been looking forward to for, literally, scores of years, that is, to settle down definitely in England: but such is the uncertainty of man's devices, that little more than a month elapsed before I found myself engaged to take a sea voyage to Africa and visit the Congo. I purposely avoid any official account of my mission, beyond stating that it was performed on behalf of the International African Association and Comité du Haut Congo, titles which, however interpreted by the ignorant or hostile, honestly represent a philanthropic and non-commercial undertaking. To those unacquainted with the origin of the movement which produced these important agencies, I would commend perusal of a pamphlet designated 'The White Line across the Dark Continent.' I need only now recall

the facts that the first conference on the subject was held at Brussels in September 1876; that the first executive committee of the International Association was composed of H.M. the King of the Belgians, Dr. Nachtigal, M. de Quatrefages, and one well known and honoured in this Society, whose present illness must be a matter of general regret and sympathy, Sir Bartle Frere; and that, as the work was for the first two years confined to the eastern coast of the African continent, the Comité d'Études du Haut Congo was formed in November 1878 to carry out exploration on the west. The object of this last body was, as set forth in the pamphlet, "to determine the practicability of establishing regular communication between the Lower Congo and the upper course of that river; and they wished further, to ascertain whether it would be possible at some future time to establish commercial relations with the tribes inhabiting the basin of the Upper Congo, and to introduce European manufactures into that region in exchange for African products. The views and projects of the committee were inspired by purely philanthropic and scientific motives. It undertook to conduct exploration, but it had no intention of engaging in commercial operations. It therefore adopted the flag of the International Association, and agreed to erect stations of the same kind and for the same purposes as those which were about to be established on the eastern coast."

It is hoped that this brief explanation will suffice to prevent any confusion arising from the indiscriminate use of two titles for what is really one and the same enterprise. The Congo Expedition is, in fact, not a mere offshoot, but part and parcel of the International African Association, whose blue flag with yellow star is now familiar and respected from Loango to Banana Point, and from Banana Point for some hundreds of miles inland.

Speaking of the possessions under that flag, a Member of the Lower House justly remarked, more than ten months ago, that no treaty made by this country with a European power "could be satisfactory which did not secure the most binding guarantees for the freedom of those international settlements which had been set up under the auspices of the King of the Belgians." The term "international" should be synonymous with "free" stations; and as these have been continuously maintained up to the present moment in the same generous spirit and by the same generous hand as thus publicly acknowledged in the spring of last year, I cannot but think that they merit the support and interest of the civilised world.

We—that is, Mr. Delmar Morgan, Doctor Rolph Leslie, and I—embarked from Liverpool on the 25th July last, in the British and African Steam Navigation Company's steamer *Corisco*, of 1860 tons, the accommodation and commissariat of which left nothing to be desired. On the 31st, we touched at Madeira, on the 7th August at Sierra Leone—where we shipped some twenty Kru-boys, to be landed again.

according to custom on the return voyage—and on the day following were off Lavanah, a place which will probably be missing from many maps. It is one of the settlements of the Sulima Trading Company, and consists of a single white house of corrugated iron, situated amid trees on a low coast, rendered all the more conspicuous by its background of dark foliage. A few neighbouring huts, and a hulk in the roadstead, complete the picture. Palm oil and kernels appear to be the principal articles of export. From the *Corisco*, on this occasion, we landed many bags of salt. Changing our course to due east, after passing Cape Palmas, we reached Bonny on the 14th, and, on the 18th August entered the Old Calabar river, moving up some 40 miles to Duke Town. Both these anchorages are too well known to need description. They are remarkable chiefly for the mangrove-lined creeks, the dwellings, hulks, and warehouses of the mercantile community, and the chapel or school denoting the presence of the Christian missionary. There are more stirring politics, perhaps, at Bonny than at Old Calabar, and there is something complicated in the relative positions of a deposed king, a regent, and a sort of powerful black baron named Oko Jumbo. At Old Calabar there is a recognised division of royalties: for at Duke Town we have “King Duke, Ephraim IX.”; and at Creek Town, a few miles higher up, it is “King Eyo, Honesty.” I had the honour of an interview with both these monarchs, but as my visit to King Duke made the more lasting impression, I will allude to that one only. The royal apartments consisted of the upper story of a two-floored building, reached by a ladder from the courtyard below, and the said ladder was drawn up when the king was absent, or disinclined to receive. There were not many rooms in this upper story, and eminent among them was the chamber containing the throne. Although his Majesty received us in the lightest and scantiest of costumes, we noted that his royal robes and crown were close at hand ready to be donned at the shortest notice: there was, moreover, besides these, a sceptre of orthodox kind. He speaks some little English, and I was given to understand that he was entirely in British interests. For my own part, I found him closeted with members of his council, discussing what might well have been state secrets with a European whom I recognised as a French fellow-passenger from Bonny; and, though we were hospitably offered a choice of palm wine, champagne, and cider, I felt by no means sure that my companions and I were not a little in the way. The most important members of the local council are Mr. J. B. Cobham, described on his own brass plate as John Boko Cobham, Esquire; and a nobleman whom I should have designated the Yellow Duke, but that he was determinately called Yellow Duke Esquire.

As at Bonny I found none but native missionaries of the Church Missionary Society, so at Old Calabar the field of missionary labour is in the possession of the United Presbyterians. Far up a creek, or branch of

the main river, are the school and mission-house of Creek Town, of which the presiding spirits are Mr. and Mrs. Goldie, both septuagenarians, whose kind reception of me, comfortable quarters, and excellent tea and cake, recalled the mind to homes north of the Tweed, rather than realised existence south of the Niger. I believe I am right in stating that Mr. Goldie has been for thirty-five years connected with this part of the coast; that he is held in great esteem by the natives; that he has been one of the foremost workers in improving the low moral tone, and destroying the more hateful customs of a fetish-following people; and that he has shown good scholarship in translating the Scriptures into Ibo or Efik. So far as external appearances can be relied on, one step in advance had unquestionably been made by the Christians of the community. There was no lack, but rather a superabundance of dress on the part of the many members of the congregation whom I met coming from the chapel at Duke Town. Perhaps, however, the greatest, and, to a certain extent, most successful effort of the missionaries has been to check the horrible practice of slaughtering all twin children, as though they were unnatural monsters of evil.

Leaving Old Calabar on the 22nd August, the Cameroon Mountain being invisible owing to the haze, and passing the noble island of Fernando Po on our right, we steered for the pretty little island of Elobi, a Spanish possession close to the mainland at Cape Saint John. Hence, after communicating with the sociable German colony, we moved on to the French settlement of the Gaboon, and anchored off Libreville on the 24th.

Here we remained two days, visiting and revisiting the shore. At one time, driven by our kind entertainer and cicerone, the German Consul, along the line of beach—some two miles or so in extent—from the mixed European station of Glas to the French Mission House and gardens, north of Libreville; at another, paying our respects on foot to the French Governor and members of the Roman Catholic mission. Unfortunately, the feature which first draws the attention of the new comer to the town is the miserable landing-place, where hidden rocks which might easily be removed are left to be a perpetual source of danger to strange boats. On the other hand, the well-constructed chapel, together with the mission house and appurtenances, are worthy of more than a passing word of praise and felicitation. M. le Berre, Bishop of Archis, showed us over his gardens, from which the whole station is supplied with vegetables; his workshops, where natives are taught various trades; and the school, where elementary instruction in letters and figures is imparted, and discipline and order are admirably maintained. In one room, where we observed several musical instruments, a native played with fair skill on an old Chappell's piano. The Governor talked much to us of M. de Brazza and his expedition, and had taken the pains to draw out, on the wall of his house, a sketch map illustrative

of the enterprising explorer's progress. From all we could learn, the Pongwé tribe is not friendly to the French settlers at the Gaboon, and their more unruly spirits are a source of constant trouble to the European settlers. Of war vessels in the roads at the time of our visit, I observed the *Dupetit Thouars* and *Volligeur*, to say nothing of the hulk under the same flag and one or two gunboats.

Leaving the Gaboon on the 26th, we touched the day following at Fernan Vaz, also a French station, or rather perhaps a station of British traders on French territory. The great article of export here is caoutchouc. This appears, moreover, to be the region, *par excellence*, of gorillas, and Dr. Leslie succeeded in purchasing and securing the skeleton of one of these animals. From Fernan Vaz we proceeded to Sette Cama and Niyanga, sites of two or three stray factories, each of which has its romance and history; and we touched at Loango, near the mouth of the Kwilu river, on the 31st August, and at Black Point on the day following. The two last places have lately come into French possession, and are immediately north of the line of coast claimed by the Portuguese. On the 2nd September we were off the pleasant station of Landana, notable for its red cliffs, and took the opportunity courteously afforded us by the agent of Messrs. Hatton and Cookson, to land there and certify to the hospitality of the European colony. There is a heavy surf at Landana, but it is worth encountering to become acquainted with the shore institutions. To the extreme left, across a small river called Chiloango, the well-known flag floats over the British factory, rich in oil and indiarubber balls. To the right is a picturesque hill, high on which we found the French doctor's neat and comfortable bungalow, and charming society; while lower down is the French mission, with its large vegetable garden, and other signs of practical civilisation. My well-informed reverend guide through the grounds singularly enough remembered me when, six years before, I had been at the island of Réunion, on the eastern coast of Africa.

On the morning of the 3rd September, we weighed anchor from Landana, and re-anchored at Banana Point about four o'clock in the afternoon. It is here that we reach the entrance to the Congo river, and as this entrance was described to the Society just three months ago by Mr. Johnston, who is now present, I need not detain you with many additional remarks on the subject. Like this gentleman, I steamed up the river to Boma, but though I have also passed and repassed by the water route between Boma and Vivi, I landed on the first occasion at Ikongola, a station on the north bank opposite Noki, some miles above Boma, and thence marched 15 miles across country to Vivi. It is from Noki that the navigation becomes especially intricate, and impossible to vessels of any great draught. A French gunboat made the attempt about a twelvemonth since to accomplish the passage, and completely failed.

Before going beyond Ikongolo, or Nkongolo, I should wish to say a

few words on the geographical, as connected with the political features of the Congo mouth. When a passenger in the *Heron*, a sea as well as river boat, in the early part of September last, my attention was directed from the chance hippopotamus suddenly appearing on shore, and the motley assemblage of Haussas, Zanzibaris, natives of the Congo, and Kabindas (the last mostly women), which strewed the fore-deck of the steamer, to the Portuguese flag floating on a conspicuous and commanding position at a bend of the river. Hence open out to the upward traveller the white buildings of Boma, sometimes written Emboma, with its background of hills. The banks of the Congo had at this time become higher and less choked with vegetation, but verdure was still apparent, and one island opposite the station presented a marvellous mass of luxuriant grass and foliage. Now, were the mouth of the river ever handed over to any one guardian, or body of guardians, it occurs to me that this or some neighbouring spot would be the natural terminus of that mouth, for such hypothesis excludes almost wholly every question but that of water communication from the sea to the interior. On the other hand, Boma itself, and the whole country about Boma, notably involves the consideration of traffic by land as well as by river. As regards the International African Association, which possesses some extent of land there, it has a peculiar interest in the place as being the site of its sanatorium: but there are also English, Dutch, French, and Portuguese commercial houses.

At about 8 A.M. on the 12th September, I started with five companions, on this occasion all Englishmen, from Nkongolo for Vivi. The road was over a mountainous country intersected by ravines. Out of six mules brought from Teneriffe, we had four available to help us on our not very long day's journey. Upon the whole we took it easily—I myself very easily. I walked perhaps eight miles; my fellow-travellers more, but there was little cause of complaint on that score for any one. We accomplished our whole distance in about six and a half hours, exclusive of a halt of an hour and a half.

We were welcomed, though unexpected, by the chief of the station, the medical officer and other residents, to whom the arrival of strangers was no uncommon occurrence. Vivi looks well enough in the distance, with its white civilised buildings overhanging the river. It is entered from the north, and might with very little labour be made inaccessible from any other side; but, though tolerably high, it is commanded by a yet higher position facing the entrance, and if strategical considerations were to have weight in the matter, it might be questionable whether a certain elevated table-land to the east would not supply a more eligible site for a permanent post. We sat down to dinner a party of about eighteen, composed of Belgians, English, and other nationalities.

As with the mouth of the Congo river, so the journey from Vivi to Isanghila has been quite recently described by Mr. Johnston, and

an account published in the 'Proceedings' of the Royal Geographical Society. A fever contracted on the march to Isanghila stopped my progress, and I was again taken to Vivi, and eventually to Banana Point. A short voyage to S. Paul de Loanda and back enabled me to revisit the mouth of the Congo for a day or two, but my companions had then nearly completed their journey to its extreme limit, and an attempt to rejoin them before their return seaward would have been vain. Rather than compress into a few words my impressions of the people, of the climate, and other matters of interest to travellers and readers of books of travel, I will now refer you to Mr. Delmar Morgan, who, with Dr. Leslie, remained some weeks longer in the country than I did, and went some 130 miles further up the Congo.

Notes on the Lower Congo, from its Mouth to Stanley Pool.

By E. DELMAR MORGAN.

(Read at the Evening Meeting, February 11th, 1884.)

ON September 20th, 1883, we started from Vivi, our party consisting of General Sir Frederic Goldsmid, Major Parminter, Mr. Valcke (a Belgian Lieutenant of Engineers), Dr. Leslie, myself, and a caravan of about 40 Zanzibaris. We had intended making an early start that morning, but it was half-past seven before we were off. Turning to the right we crossed a brook which flows at the foot of Vivi Hill and followed a path bordered on either side by tall withered grass. On our left was a range of hills terminating at Leopold Rock, which frowns over this station.

According to the compass our direction was E.N.E., or allowing for magnetic variation, which is 17° in this meridian, about N.E. true.

We ascended at first gradually and afterwards more abruptly to the summit of a hill where large boulders of quartz lay strewn about, and whence we had a view of Vivi about four miles off. We then descended into the open valley of the Loha, a small stream which falls into the Lufu, and this again into the Congo to the west of Vivi. Passing through two small villages, and leaving the larger one, Ganghila, on our right, we encamped for the first night at Buata Tulula, belonging to the chief Makaka. We pitched our tents close to the small native huts made of a grass called "Loango"; these are neatly thatched, with no windows, but with a low door at one end, to enter which it is necessary to bend almost double. The dwellings of the chiefs are generally better made and decorated on the outside with grass woven into patterns, the roofs, too, project along one side of the edifice to form a kind of verandah. The village of Makaka was half hidden among palm-trees, plantains, and plantations of manioc. Fowls are abundant;

every village has its poultry-houses raised on four poles about six feet from the ground, with light ladders leading up to them.

Our next day's march was to the village of Banza-Banza. The house of its chief Nsanda Samuna is surrounded by a tall cactus hedge. We reached Dédédé's village, shaded by splendid palm-trees, on the same day. Dédédé is one of the most important chiefs in this part of the country, and is youthful and intelligent in appearance; his dress was a red coral necklace and white loin-cloth, and in his hand he carried a staff studded with brass nails—symbol of chieftaincy.

On the morning of the 22nd we started at 7 A.M., and marched in the same direction as before, towards hills which were soon hidden from our sight by the long grass. Passing through Kapitan Lutete's village, we found that chief arrayed in a blue and white blanket. He had been at the "palaver" of the previous day, but though he saluted us with "Mbotoh," the word for "good-day," he showed no particular desire to see more of us, and his women ran away at the sight of our mules.

Outside this village was the grave of a chief, or at least such we presumed it to be, for none but these receive post-mortuary honours, and we had nowhere noticed burial-grounds of any kind. The grave in question was a mound of earth with a coarse earthenware dish placed at each of the four corners and a grotesque figure in the centre. In some cases vessels of glass and earthenware are supported on sticks above the grave, and over one, near the village of Kibandi, a roof had been constructed, beneath which was raised a pyramid of clay, with two figures representing a man and a woman placed on either side, the fence surrounding it being also decorated in the same way. It seems to be the custom of these people to bury along with the deceased all his valuables; his body is bound round with cloth, and the gunpowder he has collected during his life-time is expended in firing salutes after his death. Another custom attending these native funerals on the Congo is that of killing one or more slaves in order that their master may not go unaccompanied to the other world.

Our route now lay in a south-easterly direction, and then again towards the east. Pushing on, we left Sari-Kabanzi on our right, and from the summit of a ridge had a fine view of two distant hills bearing nearly east. These twin peaks guarded the entrance to the celebrated Bundi Valley, a place with an unpleasant notoriety for fever and sickness. But before reaching its swampy solitudes we were cheered by the beautiful scenery of the river Mvusi—a clear stream flowing in a rocky bed between banks thickly wooded by tall trees. These were leafless, for the season of the year was winter, or at least early spring, yet so thickly were they covered by vines and other creepers, and so luxuriantly did these grow that the forest looked as brilliant as though it had been midsummer, while walls of green, stirred by the slightest wind and waving from every bough, gave a look of enchantment to the whole

scene. Nothing would have interfered with our enjoyment had it not been for the persistent attacks of a small insect called a "jigger," a troublesome little pest, said to have been introduced from the Brazils.

We encamped the night of Saturday the 22nd, on the Bundi, and the next day being Sunday, we had almost decided to rest and remain in camp. Unfortunately, however, some chiefs to whom messages had been sent to meet us, were absent from their villages. This necessitated some alteration in our plans, and we determined to pass through the Bundi Valley that day. The atmosphere was hot and sultry, and the road, after crossing the lesser Bundi, passed through a desiccated swamp, the grass in some places growing above our heads, even when mounted on our mules. Up to this time our party had all been in good health; Sir Frederic, as usual, had insisted on walking a great part of the way, in order that others might ride, and when we reached Pomungola on the banks of the Congo, he was too tired to proceed; here, therefore, we halted under some fine trees and decided to pass the night. The soil was white sand, great rocks projected to the water's edge, and the spot abounded with lizards of the most brilliant colours. The following day we crossed the Lufu, and noticed the tracks of buffaloes, antelope, and hippos. This is considered the best time to hunt buffalo and antelope, for towards the end of the hot season many brooks and rivulets dry up inland, and wild animals, which are numerous in the Bundi Valley, come down to the Congo to drink. We now entered what is marked on the map as Valcke's Causeway, and whatever doubts we may have had as to the possibility of levelling and widening roads in this part of Africa were dissipated on seeing this really fine highway. It runs almost parallel with the Congo through a glade of tall trees. We rode along it for half an hour, catching glimpses every now and then of the great river on our right, and hearing the roar of the Ngoma cataract.

We halted this time after only a very short march, for the General again complained of illness and fatigue, and we pitched our tents on a level sward close to the river. A small creek intervened between us and the forest where the Zanzibaris could be seen chasing snakes, with which the place swarmed. But these were not the only unwelcome visitors, hippopotami came close in shore, and seemed disposed to dispute our right to territory which probably they had been in undisturbed possession of for many years. All night long these animals snorted near our camp, kept at bay by blazing fires, lit by the Zanzibaris. The General, too, was ill, seriously ill with the bilious fever so prevalent in this country, and there was no possibility of moving him; towards the evening, however, of the following day, a hammock arrived from Isanghila, distant only a short march, and the next morning he was placed in it, and carried to that station.

We had now accomplished the first part of our journey up the Congo, and were at the second station of the International Association. The

country we had passed through was but thinly inhabited, and the villages small and far apart. There can be no doubt that formerly this was very different, but the slave trade which was successfully carried on here not so many years ago helped in a great measure to depopulate the country, and condemned to a life of misery the inhabitants. The story we heard was that a French firm, with many establishments along the coast, was employed by the French Government to purchase and export slaves for their possessions in the West Indies. In order to legalise this traffic, a Government official went through the formality of taking depositions from these unfortunate beings that they went of their own free will, and were engaged by contract for a certain number of years. This was merely a blind to conceal the real nature of these transactions. The natives of the Congo were carried away never to return, their deserted homes and abandoned lands were soon obliterated, and wild beasts roamed over their fields. This detestable and inhuman trade was at length discontinued, but not before whole districts of the Lower Congo had been depopulated by it. Farther inland, the population is more dense, but it seems an anomaly that white men who have caused such untold misery to the people in times past, should now pass through their country, and expect hospitality at their hands.

One chief remarked that all white men who came to the Congo were criminals and outlaws, who were not allowed to live in their own country, and therefore came to seek their fortunes in Africa, an idea doubtless originating from the fact that the Portuguese formerly made a convict colony of their possessions in this part of the world—in fact, Angola is still their penal settlement.

Domestic slavery is a deeply rooted institution among the natives of the Congo. Every chief has a number of dependants, over whom he exercises powers of life and death. We have seen the chief of Isanghila come down to the rocks below the station, accompanied by his wives and slaves, to spend the day there, his men setting basket traps to catch the half-stunned fish as they were dashed against the rocks by the violence of the current, his wives chewing sugar-cane, while he himself devoted his attention solely to a bottle of malafu or palm-wine. Apart from this group, behind one of the rocks, we came upon a lad handcuffed, with a log of wood fastened to his neck by a chain, one end trailing on the ground. This was a punishment for some offence he had committed, but it reminded us of the illustrations of slave gangs in the books of Livingstone and other African travellers.

There are various kinds of fish in the Congo; one of the most curious is the elephant fish, about six inches in length, with a long trunk and no mouth, of this there are several varieties; we were also shown one of the carp species, weighing about twelve pounds; but the best of all were the whitebait: we bought some of a native fisherman near Baynesville, and found them, when fried, quite as good as any we had

tasted at Greenwich. The river had not risen much by the time we reached Isanghila, and it was possible to walk over the rocks and see the leap of about ten feet made by the water here. Below the fall are islands, and a long promontory projects on the opposite side forming a bay. The country on the south bank, as far as one could see, was hilly but there were no peaks, the outlines of the hills being rounded. Isanghila is upon the whole the best situated of the International Association's stations on the Lower Congo. It stands sufficiently high to command a fine view both up and down the river, yet the country is open near it, higher hills rising two or three miles away, where in a direction almost due north the village of Isanghila can be seen. Game is abundant, the long grass conceals many an antelope, an occasional pheasant or partridge may be flushed, while flocks of guinea-fowl tempt the sportsman to long and frequently unsuccessful stalks, for these birds are very wary.

Up to the 4th October I had kept a daily register of the temperature, the minimum in the shade averaging about 70° and the maximum from 85° to 90°. On the 27th September the maximum rose to 104° in the shade, but this was exceptional. Generally the forenoon was the coolest time of the day; after midday it became very hot, particularly when there was any sun. Cloudy days are characteristic of the climate, and this makes the heat quite endurable, particularly as a breeze often blows from the west. It is said that there are not more than 100 days of sunshine in the year, but for more exact particulars on this subject reference should be made to Professor von Danckelmann, late of the International Association, who is, I hear, about to publish the results of his observations conducted at Vivi.

On the 5th October we prepared to start up the river, and I had the misfortune to break my thermometer, thus putting an end to my observations. We had been nine days at Isanghila, during the whole of which time the General had been very ill, and though now a little better he was in far too weak a state to think of continuing his journey up the Congo, and his only chance lay in getting down to the coast as soon as possible and trying the effect of sea-air. As had been arranged in Brussels, he deputed me to act as his delegate, with instructions to continue the work begun by him. The 5th of October was occupied in a preliminary boat excursion to ascertain the feasibility of taking the mules across the river Intombe, which falls into the Congo just above Isanghila, and like many of these smaller affluents has steep banks densely wooded near the water's edge. This difficulty was overcome by placing boards across the large steel boat in which we were to make the journey, and lifting the animals bodily on to them, a task which was accomplished by our Zanzibaris under the supervision of Major Parminter.

On the 6th, every arrangement being completed, we embarked a party

of three Europeans; the Zanzibari porters, numbering 40, marched overland, meeting us each evening at pre-arranged camping-places on the river. Besides these we took two native guides, one accompanying the caravan and the other remaining in the boat. Our rate of progress being mainly regulated by the work in hand, it would be unnecessary and very wearisome to my audience to enter into the details of each day's proceedings, to mention the number of chiefs who attended the palavers, the presents they brought, consisting mostly of goats and poultry, the gifts they received, &c.; therefore only the more important points of our journey will be touched upon. We were made known to the natives as children of "Bulu Matadi"* (or "stone-breaker"), the name for Stanley on the Lower Congo, given to him, it is said, on account of the extraordinary efforts made by him and his gang of 150 men in transporting steamers for the Association overland to Stanley Pool. Gigantic difficulties had to be overcome, rocks had to be removed, and trees felled before the task could be accomplished, and to this day may be seen the marks of the broad iron wheels on which the heavy boilers and sections of boats were carried. As children then of Bulu Matadi, flying the flag of the Association, a gold star on a blue ground, we were generally well received.

One of the first districts to come under our notice was Yongho, or Yongha, a collection of villages situated on a high hill about seven miles from Isanghila, commanding an extensive view of the Congo and the country to the south of it. Towards the north we learned that it extended to some high land bearing 45° by compass, whilst on the west and north-west it bordered with Kionzo. I visited it, and found the inhabitants, who brought me delicious palm-wine, living in clean huts surrounded by plantations. The descent from Yongho on the east side is very steep, to a wide valley where the rivers Kikai and Lufudi unite before pouring their blended waters into the Congo. The Lufudi here bursts through a narrow passage of rocks between a small island and the right bank before joining the Congo, making navigation extremely awkward. Up this passage in flood time the boats have to be dragged by ropes, in order to avoid the cataracts in the main river, which may be safely passed in the dry season. It takes upwards of an hour to pull the boat a few yards. Here Major Parminter and I met with an accident that might have been serious. Arriving at camp early in the day, we took a canoe with one Zanzibari to help paddle, and proceeded up the river to try and get a shot at crocodile, hippo, or bird. In making our way through the passage just described the canoe stuck fast, and,

* Bullamatere, or Bulomatadi. Even this title is not new, for I find the same expression applied in Pigafetta's report of the kingdom of Congo (translated into English by Mrs. Hutchinson) to Dom Francisco, a noble at the court of the king of Congo in the sixteenth century. This man is described as a bad character, who exercised great influence over the king and his court, his full title being Dom Francisco Bullamatere. No reason, however, is assigned for this appellation.

being very rotten, went to pieces on the rocks, while we found ourselves on a desert island completely cut off from the mainland, and beyond call of our companions. Our Zanzibari, however, pluckily volunteered to swim across below the rapid, and he soon brought a boat to our assistance. The adventure did not quite end there, for the wrathful owner of the canoe made his appearance that evening, and describing his ancient craft as one of the best on the river, demanded heavy compensation. His chief, however, was fortunately present, and insisted upon his taking a reasonable price for it, and so the affair was amicably settled.

On the 11th October we encamped opposite a wide valley, which, we were told, was that of the Kwilu. On the maps, however, of the Baptist missionaries this river is made to discharge into the Congo above their station of Baynesville, and having on the return journey followed the southern bank and crossed the Kwilu 15 miles from its mouth, there could be no question as to the missionaries being in the right. What we had mistaken for the valley, in the first instance, was merely a plain watered by a reedy brook, and frequented by buffalo and other big game.

On the 12th October we camped nearly opposite Baynesville. The situation is a fine one; the buildings, which are constructed of native materials, grass and bamboo, are lined inside with mats, in the manufacture of which natives show considerable taste. The floors were boarded, in spite of white ants, and a few tables and chairs, with a well-filled book-case, gave a homely air to this station.

On the 15th October we were at Bemba, about half-way to Manyanga. This was formerly a station of the Livingstone Inland Mission, but it did not prove a success, and was abandoned. The krooboys attached to this station left a bad name behind them, and we found the natives disinclined to treat with white men; the villages were extremely poor, the inhabitants supporting themselves mostly by fishing. The men wear loin-cloths of coarse texture and but few ornaments; they pierce the cartilage of the nose, and insert a porcupine quill, or even a piece of bamboo, which gives them a somewhat grotesque appearance. On the 16th we were at Eluala, and tried to explore it in a canoe, but were soon stopped by rapids. The following day we ascended the Itünzima Rapids, Major Parminter lying helpless with fever in the boat, his sufferings much aggravated by the intense heat. These rapids present a formidable obstacle to navigation at this season of the year. For nearly two miles, keeping close to the left bank, our boat had been dragged by the united strength of the crew, from rock to rock, against a violent current; and it was late in the afternoon before we reached our camping place at Sonomamba. The scenery here becomes bolder, the banks higher and steeper, and in places cliffs rise up from the water's edge, always leaving room, however, for a thin fringe of trees at their base. A short distance inland are some curious rocks, which tower up

to a great height, having the appearance of ruined castles. We were now approaching the end of the second part of our journey, and on the 23rd October we landed at the foot of a steep hill, on which the station of Manyanga is built. This station is placed in a very rich and populous district. Every week a large market is held, to which all kinds of produce are brought for sale—manioc, peas, palm-wine, a variety of fruits and vegetables, and articles of native manufacture. To this market no white men are admitted; but one on a smaller scale, also held weekly, is open to all comers. Europeans resident here say the climate is unhealthy, and attribute this to malaria rising from the surrounding marshy land.

The language spoken on the Lower Congo is the Fiote, a branch of the Bantu, a wide family, embracing a large part of Africa, from the West Coast to Zanzibar, and southward nearly as far as the Cape. Zanzibaris, who speak the Swahili dialect, find means of making themselves understood by the people of the Congo, and hence their great utility in all relations between Europeans and natives. Considerable progress has recently been made by English missionaries in learning the Fiote tongue, no less than 20,000 words having already been collected by Mr. Bentley of the Baptist Mission, who intends shortly to publish a dictionary. They have no written character, their history is a blank, except where tradition preserves a few traces of their wars and migrations.

Two miles above Manyanga are the falls of Ngoma, extending right across the river from bank to bank, and placing an effectual bar to farther navigation. Henceforward the journey must be continued overland, by either of two routes: the one crosses to the south bank at Manyanga, and passing through the rich and fertile district of Lutete, where the Association has a station, crosses the Inkissi, a wide and swiftly-flowing river, and so reaches Stanley Pool; the other follows the right or northern bank as far as Nsandu ferry, and falls in with the southern route near the village of Vemba, about 25 miles from the Pool. We chose the former of these, and having tried both, I have no hesitation in saying it is the best.

On the 27th October, our mules and caravan, which now numbered seventy men, having been ferried across the Congo (here at least a mile wide), we proceeded on our journey. The rainy season had now begun in earnest, and the first night after leaving Manyanga, we experienced a violent thunderstorm, accompanied by torrents of rain. About midnight our tents collapsed, and we took refuge in a shed where our servants and some of the caravan were sleeping. Here we made ourselves as comfortable as circumstances would permit till the weather improved. Towards morning, the natives collected in large numbers to see us start, and great was their astonishment at the mules, which they believed we were taking with us to eat. The previous evening

we had witnessed one of the native dances. A circle was formed, with men on one side and women on the other, the music consisting of huge drums made of goat-skin: the clothing of both sexes was extremely scant, but they wore beads all over their bodies, and danced with great vigour.

At Lutete we visited three powerful chiefs, Lutete, Makito, and Ngombi. Lutete's village was far the best of any we had seen, its houses were larger and better built, and its plantations more extensive; here, too, wherever there was shade and moisture we found pine-apples growing wild, forming fences round the villages. Sheep, goats, and poultry are kept by the natives. Glass beads are the usual currency, those of a dark blue colour being preferred. On November 1st we took our departure from Lutete and rode over undulating country, occasionally having to cross deep gullies; every now and again we had a distant view of the Zingha fall on the Edwin Arnold river, and could see that its waters were muddy after the recent rains. Our next difficulty was taking the mules across the Inkissi. The native ferrymen had never seen animals of this kind, and were taken aback at the proposal that they should ferry them over; by lashing two canoes together, however, and placing our leading muleteer in one holding a rope attached to the head-piece of the animal, all three were landed safely on the opposite side. The Inkissi is a noisy turbulent river about 500 feet wide; immediately above the ferry it forms a cataract on either side of a small island; its banks are very steep and the water deep up to the landing place. Once across this river we were within three days' march of Stanley Pool, the goal of our wanderings. We had heard reports of Stanley's return, but these had been contradicted, and expectation was still on tiptoe for news of him. Ngoma was the last station before reaching the Pool, hence five hours' march would take us to Leopoldville or Kintamo. These last 15 miles lay mostly through dense forests, where a clearing had been cut to bring up the steamers. We had a glimpse of the Congo where the Jué or Gordon Bennett falls into it, and looked without envy at De Brazza's territory, to which his countrymen have recently been refused admission by the natives. Turning to the right we soon lost sight of the river, which we were not to see again till we had rounded the foot of the hill on which the station of Leopoldville stands and were actually on Stanley's terrace. This is a level earth-work cut away from the hill-side 300 yards long. On it stands the principal building, a long clay magazine containing stores, where cloth and a variety of articles are bartered with the natives for brass rods or *mitakos*. On the second story is the apartment of Mr. H. M. Stanley himself; here he passes whatever time he can spare from superintending works. Higher up the hill is a building for the European staff, divided into seven rooms, with an eighth where they meet for their meals. Leopoldville overlooks a bay formed by the Congo before

escaping by the rapids of (Itzi?) towards the sea. There are dangerous currents in this bay, a fatal accident occurred there shortly before our arrival. Five Houssas had gone in a canoe to hunt hippopotami, when they were carried dangerously near the rapids. Seeing the peril they were in, they tried to cross to the opposite side, but this brought them broadside on to the worst part of the cataract, and they were all drowned within sight of the station.

The Pool does not actually begin for two miles above Leopoldville, where Point Kalina facing Mfwa or Brazzaville might, if fortified, command the entrance. Hence it extends in a north-east direction for about 20 miles to the mouth of the Upper Congo. This vast lake contains several islands, the longest of which stretches nearly the whole length of the Pool, and is inhabited by elephant and buffalo. While at Leopoldville an iron boat was placed at our disposal by Mr. Comber of the Baptist Mission, and crossing over to Brazzaville we were invited to land; our time did not allow of our interviewing the head chief, but we parted on good terms with the natives who gave us a pressing invitation to return. Of the French commandant all we could learn was that he had gone away to some distance, and they pointed beyond the hills and spoke of a place called "Gobi." Mfwa is a scattered collection of villages, each having its own chief. After leaving Mfwa the lake soon opens out and discloses a deep bay on the west with islands. We landed and passed the night on Long Island. Our course next day was towards Dover Cliffs, which were supposed by Stanley to be of chalk, they are, however, silver sand, which crumbling away, makes it dangerous to go too near. It was almost dark when we moored our boats in a creek almost opposite the entrance to the Upper Congo. The cliffs rise to a height of 500 feet on either side and approach so near one another as almost to exclude the light, giving it a singularly gloomy aspect.

On the morning of the 14th November we started homewards. The 15th, the birthday of King Leopold II., was kept with due honours at Leopoldville, and all the Europeans dined together. Messrs. Comber and Grenfell represented the Baptist Mission, Dr. Sims the Livingstone Inland Mission. These missionaries find it uphill work; the Batekes, though glad to avail themselves of their medical skill, will not send their sons to be taught at their schools. At their stations lower down the river they have had more success, and at Manyanga Mr. Bentley showed me a letter from a native boy, in English, well written and well expressed. Both these missions are expecting steamers, to enable them to ascend the river, and continue their labours higher up.

The general impression produced by the Congo is a melancholy one. But few villages are seen along the banks, all being a short distance inland, and if it were not for an occasional canoe upon the water, one might at times almost suppose it deserted. The crocodile,

the river-horse, the wild fowl, and fishing eagles are left in undisturbed possession, while a few small birds, some of brilliant plumage, such as kingfishers, frequent the smaller streams. The river itself is full of eddies and whirlpools, its width averages from three-quarters of a mile to a mile wide, but the sudden bends which it makes give it the appearance of a succession of lakes.

The country had a parched appearance, owing to the long withered grass which clothed the slopes of the hills; in many places this grass had been fired by the natives, leaving dark patches. When we were leaving, everything was beginning to look green. Near Stanley Pool there are extensive forests, and we saw beautiful flowers and butterflies among the trees, but having little time for collecting, we did not secure specimens of either. Among the wild animals of this country, besides those mentioned, is the ichneumon, very common, and easily tamed; one they had at Manyanga played fearlessly with the dogs of the station. Chameleons were also brought to us at Stanley Pool. Leopards are sometimes killed, their skins are greatly valued, and are a sign of chieftaincy; leopard's teeth, too, are worn in a chief's headdress. The hairs of an elephant's tail are also highly prized; they are used for the strings of a musical instrument something the shape of a small harp. The country abounds in minerals; we were shown specimens of copper, malachite, and lead.

Among the curious customs of the Lower Congo is that called *Inkimpi*. This is a kind of freemasonry to which every youth aspires to be admitted. He has to undergo a preliminary ordeal, which lasts about a year: during this time he lives out of doors, and holds no communication with his fellows; he paints the upper part of his body white, and wears a dress of palm-leaves from the waist downwards. He undergoes the rite of circumcision, and receives a name by which he is ever afterwards known. Lutete, Sakala, are favourite names. When the period of probation is over, a grand procession is formed, and thousands assemble to see it.

The International Association has, during the last few years, accomplished a great work in opening out Africa. Upwards of 5000 miles of navigable rivers are accessible from Stanley Pool; three steamers are already launched on its waters, and accompanied Stanley on his last expedition, while a fourth is on its way out.

As St. Petersburg was termed by Peter the Great the window through which Russia looked into Europe, so may Leopoldville be termed the window opened by Leopold II. through which Europe may look into the heart of Africa.

Previous to the reading of the above papers—

The PRESIDENT said that both the authors had on previous occasions appeared before the Society, and that it was therefore almost superfluous for him to introduce them. He could not, however, refrain from calling their attention to the public

services of Sir Frederic Goldsmid in many parts of the world. Upwards of forty years ago he entered into her Majesty's service. After being engaged on the coast of China, and in Scinde and Persia, he was employed by the Government on the important work of deciding on the boundary between Beluchistan and Persia. Subsequently he filled important posts in Mauritius and in Egypt, and he has lately been employed in the service of that most philanthropic association which was started by the King of the Belgians in connection with the exploration of Africa. Unfortunately Sir Frederic Goldsmid was taken ill in an early part of the expedition, but he had with him Mr. Delmar Morgan, who went on and ascended the Congo to complete the task which Sir Frederic otherwise would have performed. The Society had recently had the advantage of listening to Mr. Johnston's account of a journey in the same region, but it was well to have also the results of the sagacity and experience of such observers as Sir Frederic Goldsmid and Mr. Delmar Morgan.

After the papers had been read,

The Rev. HORACE WALLER said it was quite clear from the lucid sketch of the Congo which had been given that great difficulties would beset philanthropists, missionaries, travellers, and merchants in gaining the navigable part of the river. Much climbing up stairs would have to be undergone before a good look was obtained out of the window into the interior of Africa. The question arose how the country was to be got through. It might be said it could be either traversed on foot or with mules, but he was sorry to say from his former experience on the east coast that the chief difficulty arose from a Western nation. He wanted to know what the position of Europeans who went out to the Congo would be with regard to Portugal. The question cropped up in the House of Commons last year, and there was a very hot debate upon it. If he was rightly informed the position was exactly this. Mr. Gladstone closed the debate last year by giving a positive assurance that even supposing it might be necessary during the recess to conclude a treaty with Portugal that treaty should not be ratified until ample opportunity had been afforded for holes to be picked in it if possible. He thought it was the duty of everybody who looked forward to the opening up of that great country to keep his eye upon the matter as it now stood. It was evident that as soon as a traveller entered the mouth of the Congo he must land and proceed over land. His goods must be disembarked, and if the journey had to be taken over Portuguese territory, Portugal would inevitably levy black mail to support her convicts, whose presence on the coast tended towards the destruction of everything like morality. If the English Government were to empty the convict establishment of Chatham into some station in Africa the last state of the place would be worse than the first; and it behoved everybody to get a sight of the treaty with Portugal as soon as possible.

Mr. H. H. JOHNSTON said the papers had described the country round the Congo with photographic accuracy, and therefore he would only add a little piece of news which reached him a fortnight ago from a Belgian officer out there. He learnt that canoes had come down to the station and brought the news that Stanley had had rather a bad reception beyond the Mangala river, and had been forced to retrace his steps, and that De Brazza's lieutenant, accompanied by a French missionary, was chased by the natives away from Mfwa, and had to appeal to Stanley for help. He had it on the authority of Mr. Stanley himself that if ever a railway was made to Stanley Pool it would be along the valley of the Kuilu, in which case Landana would be its outlet. When he was there Mr. Stanley was very anxious that it should not get into the hands of either the French or Portuguese. The Dutch merchants at Banana had informed him that there was an arrangement on foot by which the Portuguese Government would occupy both sides of the Congo mouth. In that case everything else would be in the hands of Portugal. He read in the daily papers that

the Portuguese were prepared to allow the same liberal terms as were at present in vogue in Mozambique; but those who knew anything of Mozambique would think that the terms were rather illiberal than otherwise. He therefore thought it would be a very unfortunate thing if Portugal was allowed to occupy Landana and Banana, the two points which would affect the Congo in the future.

Commander V. L. CAMERON called attention to the fact that the route viâ the Zambesi and the Shiré to the north-west of Nyassa had now become a frequented highway, and that not very far from that lake were the head-waters of the Congo—the river Chambezi—where Livingstone worked. To descend that river would be an easier task than to ascend it, and by transporting boats built in sections a traveller might without much difficulty descend the great river and ascertain where all its great tributaries came in and also decide how far the Lomame was navigable. He had no doubt that a large portion of the Congo might be utilised for navigation and commerce. He had read a good deal lately in English papers about M. De Brazza. He himself was not only acquainted with De Brazza but with members of his family, and a more modest man could not be found. He was an enthusiast in his work, but he did not think any Englishman ought to set that down as a failing. He had travelled hundreds of miles alone, without a shoe to his foot, and in rags and tatters, and worked his way from the Ogowé to Stanley Pool. He had not a single man, white or black, to accompany him for a long portion of his journey.

Sir FOWELL BUXTON said although he had nothing to contribute to our geographical knowledge of the Congo he wished to put one or two questions to the gentlemen who had so recently returned from the river. It would be interesting to know what, if any, traces were still to be found of that Portuguese dominion which was of great importance several centuries ago. Formerly that dominion was a real thing, and it was administered to a great degree on the best Christian principles of that time. The old Portuguese governors wished that their government should be for the benefit of the governed, and they exercised their control with a great deal of masterfulness, guided by Christianity. It could not be doubted that their government extended over a very large area and lasted for a long time. If all trace of their dominion had vanished it would be a fact worth knowing. He also wished to know if the readers of the papers were able to measure the effect of Stanley's and De Brazza's work—whether trade had sensibly increased, and, if so, whether that increase had led to greater communication between the different tribes and therefore to more friendly intercourse and to the diminution of intertribal wars. He believed that such had been the effect where communications had been opened out in other parts of Africa, and it might reasonably be hoped that the same result would be experienced in the valley of the Congo.

General Sir F. GOLDSMID, in replying to the questions that had been put, said that from the little he had seen of the Congo, he was only able to answer imperfectly; but he thought there was now scarcely any trace whatever of Portuguese dominion in those parts. At the present day he did not suppose that the Portuguese were better known along the river banks than the English, Dutch, French, or other nations there represented. At Loanda, of course, Portuguese influence prevailed, as also further down the coast for some distance; but it was generally understood that a "white man" could not go from Loanda to Ambriz without being molested by the natives. A statement to this effect will be found in Mr. Monteiro's clever book on Angola, published about nine years ago, and he (Sir Frederic) had learnt on trustworthy local authority, corroborated, to the best of his recollection, by a Portuguese gentleman on board the steamer in which he travelled, that such was still the case. With regard to the trade on the Congo, he did not think that as yet there had been any palpable increase in the imports and exports, but this result

could hardly be expected so soon. He had little doubt that when more stations had been formed, and the aims and objects of the Association were more clearly understood, the whole would in time become centres, as it were, of traffic, and a great impetus would be given to commerce and the march of civilisation.

The PRESIDENT, in proposing a vote of thanks to the readers of the papers, said he would not be tempted by the political hints that had been thrown out to enter into the question whether or not Mr. Gladstone was going to violate his promise that the treaty with Portugal should be submitted to the House of Commons, nor whether the Dutch merchants had received information as to the contents of the treaty, which were not known in this country. He had no doubt that in process of time it would be found that Her Majesty's Government would do all that they had promised to do, and submit their treaty to the consideration of Parliament; and he was bound to say that if they had shown too great consideration for the interests of Portugal, it could not be for want of ample notice, in Parliament and out, of the opinion of the mercantile community in this country. With those considerations, however, the Geographical Society had nothing to do. Their interests were geographical, and the progress of geography led to commerce, which, when conducted as it was in these days, generally led to the advantage and improvement of a country. It may not have been so in the past, when the most active commerce in those districts was in human beings; but things were altered now, and with little exception commerce was now the handmaid of progress.

New Guinea: a Summary of our Present Knowledge with regard to the Island. By COURTS TROTTER.

Map, p. 244.

AN abstract of a paper on New Guinea, read at the last meeting of the British Association by the present writer, appeared in the 'Proceedings' for November last; but the increasing importance of the subject, besides the impossibility of obtaining the desired information in a collected form, may warrant a more detailed sketch of the progress of discovery in that island, with a few notes on the character and habits of the people, on the resources of the country, and its political relations.

Area. First Discoverers.—New Guinea, the largest island in the world after Australia, with an area of some 306,000 square miles,* i. e. as large as France and Great Britain together, was probably discovered, or at all events first sighted, in 1511, by Antonio de Abreu, for he penetrated eastwards as far as the Aru Islands, and sailed thence north to the Moluccas. In 1526 Don Jorge de Meneses, on his way from Goa to Ternate, whither he was proceeding as Portuguese governor, being driven out of his course, anchored at a spot which he calls *Isla Versija*, "lying under the Equinoctial," and which is perhaps to be identified with Warsia, a place on the north coast, in about 131° 45' E. and 0° 50' S.; but it may possibly have been the Papuan island of Waigiu.

* According to a careful re-computation in Perthes' Geographical Establishment at Gotha, the area is 234,768 square miles (geographical). 'Geographische Mittheilungen,' 1881, p. 48.—[Ed.]

The Spaniards, however, contest the honour of the discovery, for two years after this, Alvaro de Saavedra, returning eastwards from the Archipelago, sighted the coast of "Papua" for some hundred leagues, and "cast anchor in a great gulf near certain islands," which he named *Islas de Oro*, presumably on the north coast. Again, in 1536, the survivors of Grijalva's company, after their mutiny and shipwreck, and subsequent rescue from slavery by the illustrious Antonio Galvano, give a short but circumstantial account of "the Papuas."

The vagueness, however, not only of these, but of all the early visitors to New Guinea, is unsatisfactory. Many records no doubt are lost, while many were intentionally falsified at the time, either to divert a rival from a new discovery, or to place it on the right side of the Papal meridian. The coasts were probably surveyed to a greater extent than is commonly supposed by the early Spanish and Portuguese navigators.* Among the more important of the former was Ortiz de Retes, in 1545, who laid down a number of places along the north coast, and probably first gave the name of New Guinea, from the resemblance of the natives to those of the African coast; at all events, the name was known in 1567, when Mendana describes the Solomon Islands as being "near New Guinea." By the end of the century, or, in short, by the time when Torres passed from the eastward through the straits which now bear his name, the outlines of the coast, or at all events the general form of the island, was for the most part roughly known. No doubt the approach to the north coast, east of Cape Finisterre, was barred both by ignorance of the fact that New Britain was an island, and by the intricacies of the Louisiade Archipelago. Thus none of the explorers before Dampier's time, coming from the eastward, were able to cross the land further east than about the 146th meridian.

Again, although the passage of Torres, in 1606, had shown the severance of New Guinea from Australia (which indeed is indicated, mysteriously enough, on maps of an earlier date †) the discovery was not generally known for many a day after. In the instructions given to Tasman, in 1644, he is ordered, after passing Port Ture or False Cape in S. lat. 8°, and continuing east to 9°, to examine a great cove—apparently the north side of Torres Straits—for a passage to the South Seas; and thence to coast the shores of the unknown South Land as far as 17° S., i. e. to the point previously reached in the Gulf of Carpentaria, a locality which even sixty years later seems to have been generally thought a part of New Guinea, though Keyts, in 1678, "believes New Guinea to be separated from New Holland in about 10° S. lat." But

* Some curious evidence to this effect will be found in the map of D'Abancourt, published at Amsterdam by Mörter 1700, and reproduced and discussed by Dr. Hamy in the 'Bulletin de la Soc. de Géographie de Paris,' for November 1877.

† See maps of Asia and of the Pacific, dated 1589, in Ortelius's 'Theatrum Orbis Terrarum,' and Hondius's *mappemonde* to illustrate the voyages of Drake and Cavendish, Hakluyt Soc. Trans. vol. xvi.

even in 1768, Bougainville, who, having reached Orangerie Bay, at the south-east extremity of New Guinea, from the eastward, was unable to continue his voyage, writes that "Nothing indeed was more probable than the existence of such a passage" as a strait to the westward!

Torres's report of his voyage, addressed to the King of Spain, remained unknown till discovered at Manila, on our capture of the place, in 1762,* and the straits, then named after Torres by Dalrymple, were never thoroughly explored until Cook passed through them in 1770. But in fact, for sailing vessels, the passage through such a labyrinth of reefs, with a monsoon, concentrated by the high lands on either side, blowing violently for six months in either direction, could never have been of much practical use. Even Flinders, writing early in this century, speaks of it as a thing unheard of, and probably impossible, that a ship should pass through from the west; and though these conditions have now, of course, been entirely changed by steam, even steamers can sometimes hardly face the united power in the straits of wind and tide.

Early Explorers.—The chief explorers of the west and south-west coasts during the seventeenth century were the Dutch. The journal of the *Duyfken*, Willem Jansz, a classic name in Pacific discovery, is unfortunately very imperfect. His instructions, written in 1602, curiously enough speak of New Guinea as an island. Starting from Ceram in 1606, the commander noted several points on the south coast, and passing the Aru Islands, proceeded to the south-east, whence, taking the mass of islands in Torres Straits for continuous land, he returned by the north coasts of Australia, supposing this to be still the coast of New Guinea. It is interesting to speculate what would have happened had he encountered Torres, who at this very time, unconscious of the full bearings of his discovery, was sailing through the Straits from the eastward! The voyages of their successors during the century were confined to superficial explorations on the south-west coast, their object being always and merely the development of trade. In 1624 they made treaties with the chiefs in the Aru and Ke Islands. In 1636 Gerrit Pool, crossing like his predecessors from Banda to the opposite coast, found the Ceram traders, who had come for massoi bark (already a chief article of export) jealous of his presence. They, as usual, and probably to discourage him from proceeding, represented the natives of "Onin" as very fierce and dangerous; and after sailing down the coast eastward for some days he was killed on attempting to land. The chief item of export at this time was slaves, and by 1654 the demand for these, owing to the extension of cultivation in the Dutch Islands, becoming more active, an agreement was made by Braconnier with the king and chiefs of Onin to have 200 or 300 slaves,

* His accurate surveys of points on the south and east coasts lay buried at Simancas till 1878 when, after the appearance of Captain Moresby's work, they were published in the 'Boletín de la Sociedad Geográfica de Madrid,' iv. 1878.

and a considerable quantity of massoi, ready for them every year. In exchange the Papuans took clothes, hatchets, swords, &c., the price of a slave in these goods being 25 to 30 reals, and when paid in advance these unsophisticated heathen would sometimes return the goods if unable to produce what they had promised.

Vinck, in 1663, describes all the tribes along this coast as at war with each other, and selling their prisoners for slaves; a state of matters which, added to the malpractices of the Ceramese and other traders, was sufficient to account for the hostile reception which the strangers often, though not universally met with. Vinck was well and hospitably treated. He, like others, made first for "Onin," which is described as a village also known as Ruma-batti, on the south side and at the entrance of the deep bay since known as McCluer inlet, which he afterwards explored, but without finding the tailed men said to inhabit the coasts. A more important voyage was that of Keyts, who in 1678 examined more closely than heretofore the neighbourhood of the island of Adi and the bays and river mouths on the coast opposite. Towards 1690 we find the trade considerably harassed by the "Papuan" piratical expeditions which, starting from Mysol and from places on the mainland, swept the seas from the Aru Islands to the Tenimbers and Amboyna.*

By the beginning of the eighteenth century the south coast as far west as the entrance to Galewo Straits was known. Later, in 1746, we find again a jealousy of the Ceram traders, and the natives of Onin beg the Dutch traders to deal directly with them. Next year, however, the skipper Wagenaer was killed by the natives, not, as they asserted, without provocation, and in 1784 the Dutch Government having heard that spices were being imported by Bughis and other unlicensed dealers from Wony (Onin) to Goram and thence to Bali and Manila, gave orders to extirpate this "nest of smugglers." The king of Tidore, however, declined to act, and the Dutch were not in a position to force him; while their local authorities represent the operation to be beyond their own resources, and assert that smuggling can only be kept down by regular cruisers.

In 1796 the Dutch surrendered Banda to the English; and owing to this, and to their political embarrassments in Europe, little more was done by them before the peace of 1815.

Turning now to the north coast, the discoveries during the seventeenth century were few. Lemaire and Schouten in 1616, arriving from the east after their adventurous voyage round the Horn, coming round the north of New Ireland, sighted one of the volcanoes of the group which now bears the name of Schouten, and afterwards anchored in a bay on the mainland in about 145° E., where they found the natives friendly. Their course then lay westward, by the great islands of

* Nearly a century later Forrest speaks of the Papuans of Salawatti and New Guinea as assembling and making war on "Ceram, Amboyna, Gilolo, Amblon, and as far as Kulla Bussy."

Geelvink Bay to the cape at the north west extremity of New Guinea. Tasman, thirty years later, followed much the same course.

The important voyage of Weyland in 1705, resulting in the survey of the north coasts as far as Geelvink Bay, was due to the fears excited by the arrival there, after his discoveries to the eastward in 1700, of Dampier. This great explorer, second only perhaps to Cook among English navigators, had just sailed round and named New Britain, showing it to be an island—an important factor in New Guinea geography—and had communicated at several points, in somewhat rough fashion certainly, with the natives. Weyland reported the north coast to be devoid of spice-bearing trees, and the people wild and ill-suited to deal with. Fruitful as are the annals of Pacific discovery in the eighteenth century, further contributions in New Guinea are few. Captain Cook's valuable survey of Torres Straits was followed, in ignorance of any previous attempts, by the voyage of Captains Bampton and Alt of the (English) East India Company's service, who visited and described for the first time several of the islands with which these straits are studded, especially those on the New Guinea coasts, which they examined up to the head of the Gulf of Papua, in the hope of finding a passage to the northward. Their difficulties may be measured by the fact that their passage of the straits occupied 72 days. They suffered greatly from want of water, and Captain Bampton's apparatus for distillation, extemporised out of a cooking vessel and a teapot, a speaking-trumpet and a gun-barrel, shows him to have been a man of ready invention. These commanders annexed Darnley and the neighbouring islands, with the adjacent coast of New Guinea, to Great Britain.* The traveller, however, from whom of all others in this eighteenth century we learn the most is Forrest, who visited New Guinea in 1774 in search of spice-bearing lands to the east of the Dutch possessions, and, chiefly to escape the interference of the Dutch, sailed in a little 10-ton vessel, the *Tartar Galley*. He landed at Doreh Bay on the north coast in long. about $134^{\circ} 10'$, a place which, from its long and narrow but sheltered harbour, has since been the usual halting place of passing vessels, and the headquarters of explorers. It has, besides other advantages, a strip of open and cultivated country, with numerous hill streams, sloping gently up to the forest, which is composed of great trees, but devoid of underwood, so that travelling is easy. Like later writers, he describes the mountain and coast people as on bad terms, but trading regularly in their respective produce. By dint of search, and the promise of a reward, he discovered the nutmeg tree (of the long species, *M. fatua*) in the adjacent island of Manaswari, a place of interest to Englishmen, for it was occupied by an expedition from India towards the end of last century. He was much impressed with the importance of sago as a means of subsistence, and speaks of the value it

* And yet Darnley Island, along with Tuan, Saibai, Talbot, and Murray, were annexed, as if for the first time, to Queensland in 1877.

would have been to the early explorers. Torres, however, mentions "a biscuit they call *sagu*, which will last for twenty years." At Rawak in the island of Waigiu, Forrest laid in 2000 cakes of sago of 1 lb. or 1½ lb. each, baked hard, which kept well. His intercourse with the people during a residence of several weeks was always pleasant, owing to his wise and conciliatory conduct. They too welcomed his visits, and he notes that they made pottery, though ignorant of the wheel, and that the women sang to him much better than the Malays. The reports he collected by hearsay of the parts about Geelvink Bay have been superseded by later information. He states that the people of Ternate and Tidore were forbidden by the Dutch to trade with New Guinea, a privilege they only granted to the "discreet" Chinese, who carried Dutch colours; but the Ceramese were trading with the south coasts at this time.

Dumont D'Urville.—Forrest's observations were corroborated and supplemented in 1827 by Dumont D'Urville, who notices, as others have done, the extraordinary height of the trees in the forest, and also that they are of two different degrees of height, the mimosas and pterocarpus towering above the rest like a second forest. A yearly tribute, he says, was being sent to Tidore. This accomplished explorer, though unable to land at Humboldt Bay, foresaw the great importance of its position, an opinion borne out by all subsequent voyagers.

Recent Dutch Exploration.—About this time the Dutch, after a long interval, began to show renewed interest in New Guinea. In 1826 Lieut. Kolff in the *Douga*, in 1828–30 Lieuts. Steenboom and Modera in the *Triton*, and in 1845 Lieut. Langenberg Kool in the *Siren*, examined more systematically than heretofore the part of the south coast opposite Ceram, in about 132° E. long., the seat of their earliest intercourse with New Guinea, and as far as the other side of Prince Frederick Henry Island in about 139°. The various inlets and islands of the great bay which lies at the back of the island of Adi, visited by Keyts in 1678, were pretty thoroughly explored, one object being the establishment of a permanent post; and a stockade, inclosing a few huts, was erected at the foot of the Lamantsieri Mountain, near Triton Bay, but finally abandoned in 1835. Their principal discovery, however, was the strait dividing Prince Frederick Henry Island from the mainland, its two entrances having up to this time been supposed to be the mouths of rivers. The strait proved to be from two geographical miles to one-sixth of a mile in width, with a depth of 4 to 10 fathoms, and affording but little shelter for vessels. Several streams enter the strait on either side, but the banks are shallow, muddy, overflowed at high water, and almost impossible of access. The great difficulty indeed of approaching the coast here, and in fact from 135° 30' eastward, is that it is so shallow that vessels can seldom approach within four miles of the shore, and sometimes have to anchor out of sight of land. No mountains are visible here, and the

coast region is a flat, mangrove-covered, half-drowned country, probably a vast delta of streams which flow from the inland mountains, and it maintains the same character as far as Torres Straits, and indeed to the head of the Gulf of Papua. West of $135^{\circ} 30'$ high hills begin to be visible, gradually rising in height and approaching nearer to the coast, and apparently terminating in a bluff at Cape Buru. The more distant mountains are rounded or flat-topped, with occasional peaks, the lower coast range bolder and more precipitous, especially at the headlands; beaches are rare, except in the numerous little bays, and the shore is dotted with islands which take the character of the land opposite to them—high or low; in the former case the limestone rock is eaten away by the waves, leaving a mushroom-shaped summit. The scenery among the channels which divide these islands, backed by the high cliffs and distant mountains of the mainland, is described as exceedingly beautiful. The inhabitants of the mainland, where it is too steep for cultivation, often betake themselves, for this purpose, to the lower islands. The formations in the interior are said to be jurassic limestones and dolomites. The Utanata river also brings down pebbles of a grey and apparently ancient sandstone; and bog iron ore and a light porous volcanic slag are found in Princess Marianne Straits. Some information on the social and political condition of the natives was obtained by these expeditions, through not very efficient interpreters; but some of the chiefs on these coasts have visited Ceram, speak Malay, and have Malay blood in their veins. There is a brisk trade with Ceram and the neighbouring islands, and many of the people are Mahommedans. They have various titles and dignities, but all of foreign origin, and bestowed in different ways. The higher chiefs usually hold from the Sultan of Tidore, but others are elected among themselves, or have been invested with a title and a robe of honour—their only garment—by the Ceramese traders.

It seems needless to record by name the various Dutch and other expeditions which from this time (1835) onward have visited the south-west and north-west coasts of New Guinea. Their notes, like those of their last-named predecessors, on the natural history of the region, are as extensive as the very superficial contact with the country permitted, but this naturally limits their value for purposes of general deduction, and as regards pure geography it must be admitted, without impugning the skill or energy of their commanders, that except as regards the neighbourhood of Geelvink Bay, they have not added greatly to the knowledge acquired from the reports of their predecessors. Their narratives have been collected and published by Mr. Robidé van der Aa, and their interest is enhanced by the valuable notes and comments of that accomplished geographer. The precipitous south-west coast is broken by the remarkable inlet known as Telok Berau or McCluer Gulf. Its southern shores are hilly, but the northern low and swampy, producing great quantities of sago, the mountains inland from thence being inhabited by

a savage race who are the terror of the coast-dwellers. This swampy character, and shallow seas, continue to mark the coast for some distance to the northward of the inlet.

The west and north coasts of the great western peninsula resemble in character those of the south-west coasts, except that in the straits opposite Salawatti the shores, like those of that island, are swampy. The mountains, however, rise at a short distance inland along the north coast, and the high land on the north of Salawatti is doubtless a continuation of these. On the northern coast, nearly as far as Geelvink Bay, the shores are precipitous, and there is no anchoring ground owing to the depth of the water. The ranges of hills, rising one behind the other to the height of some 3000 feet, and reaching far inland, are usually wooded, but with bare tracts, due in part to earthquakes and forest fires, and extend the whole distance, apparently joining the Arfak Mountains. This hill region is inhabited by tribes of various character, some nomad, and supplying their few needs from without by the sale of bird-skins and slaves, or by plunder; others, like the Amberbaki, industrious cultivators.

The west shores of Geelvink Bay are also rocky, but at the head of the bay, and on the east side, especially towards the north, they are level and swampy, and inland only a few isolated hills are seen. Here the great delta of the Amberno river comes in, with its shores overgrown with casuarinas and nipa palm, and evident far out to sea by the mud and masses of floating timber. Beyond this eastwards, the land again rises gradually; scattered hills, then continuous wooded ranges appear with occasional bare patches of limestone rock, and frequently showing a ferruginous red colour, which gives to the district its Malayan name of Tana Mera. The coasts are steep, and, like the inhabitants, difficult of access; and though good anchoring ground may be found, no harbours are known except within the sheltered reaches of Humboldt Bay.* Eastward from this, the coast generally maintains the same precipitous character, with a fringing reef and very deep water close in shore, and occasional headlands, the mountains reaching at Huon Gulf a height of 9000, and at Finisterre probably 11,000 to 12,000 feet. Opposite New Britain, however, for about forty miles, a strip of cultivated land extends along the shore, the hills beyond rising in fertile and cultivated plateaux or terraces. Near Cape della Torre, as also in Huon Gulf, and again at about the 148th meridian, are the mouths of considerable rivers.

Torres Straits, Gulf of Papua, and South-East Coast.—To return to Torres Straits, the work of Captain Cook and less systematic observations of Captains Bampton and Alt, Bligh, and others, were materially supplemented in 1842 by the labours of Captain Blackwood, in the *Fly*, as described in Mr. Jukes's valuable narrative, which contains

* Mr. W. Powell, however, says there are several such bays on this coast.

a detailed account of the more important islands in the straits, those nearest to the Australian coast being shown to be a continuation of the high lands of Cape York, others of coral, and further east of igneous rocks superposed on stratified sandstones and conglomerates, pointing to repeated volcanic action. The western side of the Gulf of Papua was also explored for 140 miles, including the mouth of the Fly river, one of whose channels they ascended for several miles, the writer arguing from the general conformation, so far as it was known, of the mountain system of New Guinea, that the whole of the coast in question must be the delta of a great river; and he is fascinated with the idea of thus easily penetrating to the heart of the country, a feat reserved for Signor D'Albertis thirty years later.

From the head of the gulf to Cape Possession the coast-line was surveyed by Lieutenant Yule, in the *Bramble*, while Captain Owen Stanley, in the *Battlesnake*, worked up to this point from the Louisiade Archipelago, without, however, having examined or ascertained the precise eastern limit of the mainland.

Meanwhile the proximity to Australia, the establishment in Torres Straits of the pearl-shell fisheries, which are now so valuable, and later on the settlement in the islands and on the opposite shore of English missionaries, led to an increased knowledge of this part of the coast, to which an important and timely addition was made in 1873 by the survey of Captain Moresby in the *Basilisk*. His stirring and agreeable narrative did much to awaken the general interest now felt in the subject, while conveying an indirect reproach for our previous neglect and indifference. More fortunate than his distinguished French predecessors, he was able to lay down the exact configuration and limits of the eastern extremity of the mainland and the neighbouring islands, so acutely guessed at by Dumont d'Urville, and after rounding the south-east capes, not only to lay down with some precision the landward limits of the D'Entrecasteaux Islands and the straits which separate them (only seen from the north by D'Entrecasteaux), but materially to correct the existing charts of the opposite (northern) coast of New Guinea for some 480 miles, or nearly 700 of actual coast-line.

From near the head of the Gulf of Papua eastwards the south coast has no longer the level, half-drowned character which distinguishes it all the way east from long. $135^{\circ} 30'$, but is marked by ranges of rounded hills of an Australian character, sparsely timbered with eucalyptus and acacia, and is skirted almost continuously from Redscar Head to its extremity, at a distance of five to six miles, by a reef, an outlier of the Great Australian Barrier, within which are excellent harbours and anchorages.

Interior.—From what has been already said, it will be seen that our knowledge even of the coasts of New Guinea is as yet far from complete. But our acquaintance with the interior is still more imperfect, and

though doubtless something may be inferred from what has been seen by travellers in the eastern and western peninsulas, the great central mass of the island is still, if we except Signor D'Albertis' voyage up the Fly river, absolutely unknown.

Eastern Peninsula.—The eastern peninsula has been penetrated for some little distance in different directions from the south coast by the English missionaries Messrs. McFarlane, Lawes, Chalmers, and others; and Captain Armit, who recently went there as the correspondent of the *Melbourne Argus*, penetrated further than any previous traveller, though he did not reach the mountains of the central (Owen Stanley) range, which measures 13,200 feet.

The comparatively bare Australian-looking coast range is backed by a succession of higher ranges with precipitous ravines and occasional open valleys, sometimes a few miles in width, full of rich deep soil; the whole watered by fine streams, and clothed with dense tropical forest interspersed with open grassy patches. In these intermediate ranges the rocks in some parts are volcanic, in others a volcanic breccia is found resting on metamorphic strata, consisting of talcose and plumbeous schists and slates, with veins of quartz. The valleys, and in many places the hill-sides, are cleared and carefully fenced and cultivated. Very fine sugar-cane, cotton, and tobacco are found everywhere, and yams and taro (among other food-sources) are extensively grown, and stored; an oak grows there, and pigs fatten on the acorns. The natives are reported as singularly amiable, honest, and pleasant to deal with; their first impressions of Europeans, which were taken from the missionaries, having happily been confirmed by the general conduct of subsequent travellers, prospectors for gold and others. Without the aid they have willingly given as carriers, exploration would, in fact, have hardly been possible. The different tribes seem, however, as a rule, to be at war with each other, and the prevalence of the *dobbo* (houses built high up in the trees) and stockaded villages testify to a general insecurity.

At least two types of population are reported here; one, perhaps corresponding to the race with Polynesian affinities who occupy the neighbouring coast, is fair, and taller and more intelligent than the other, with aquiline noses and high foreheads; in the other race the forehead is lower, the nose flat, and the hair, it is said, inclined to be "woolly"; i.e. probably the "mop" is less elaborate. Others are described as intermediate in appearance, but the observations made are insufficient to argue upon.

Fly River.—Of the many river mouths which appear to drain the vast level region which begins on the west side of the Gulf of Papua, more than one may probably, under favourable circumstances, lead into the heart of the country; the coast-region may, in fact, be a network of streams. Ascending the Fly river, Signor D'Albertis reports that after leaving the coast, he passed first through a plain and apparently often flooded

region with patches of forest, but otherwise treeless, and having rather an Australian than a tropical appearance, overgrown with great reeds and grasses, with isolated hills rising from the plain, which correspond, we may conjecture, in position and character, to the islands of Torres Straits in that they also, at no remote geological period, were islands surrounded by the sea which then covered the surrounding plains. They would thus remain as nuclei of Australian vegetation, though the Indo-Malayan flora has now nearly exclusive possession of the level country. Further inland, i.e. within 200 miles (as the crow flies) from the sea, the tropical forest (which, curiously enough, is found also in many of the Straits islands) again prevails. Some fifty miles further inland, the country, as far as could be seen through the dense jungle, became undulating, with conical hills, the stream, which now contained pebbles of quartz, of basalt, and other igneous rocks, became shallow and more rapid, and the traveller was forced to return while the high mountains were still apparently some 50 miles off.

The unfortunate character, from whatever cause, of his relations with the natives, greatly restricted his observations, both of the country and of the people. The latter, whom he met with throughout at irregular intervals, he believed to consist of migratory tribes; at all events they seemed to have combined with some unanimity to oppose his return passage. Still, though the result is in some ways disappointing, the length of stream surveyed through an entirely new district, along with the birds, plants, skulls, and other objects brought home, give considerable importance to the journey. The only other journeys into the interior worth recording are the expeditions made both by Signor D'Albertis himself, by another Italian naturalist, Dr. Beccari, and by Von Rosenberg and others into the Arfak Mountains of the north-west peninsula, and Dr. A. B. Meyer's journeys from Geelvink Bay across the isthmus.

Interior of North Peninsula.—Leaving Andai, a coast village situated in a small plain to the south of Doreh, the traveller ascends the first wooded range, to a plateau some 1500 feet high, beyond which, inland, extends a mass of steep and lofty mountains, covered with forest to the height of several thousand feet. In the lower parts the great trees have little or no undergrowth, but higher up is a dense growth of ferns, lycopodiums, &c., favoured by the damp mists and copious rain, which falls there even in the comparatively dry season of the south-east monsoon, and many plants of temperate or sub-alpine origin, as oaks, rhododendron, vaccinium, epilobium, and various Umbelliferæ.

These mountains were supposed to be the peculiar home of several species of birds of paradise, which, however, have recently been found also in the mountains of the south-east peninsula, and no doubt these and an extensive alpine flora will be found at similar or greater elevations throughout the whole length of the island. Looking west-

ward from these heights the country appears like a wooded plain dotted with hills, while to the south-west and south are lofty mountains also forest-clad. But it must be remembered that these excursions, interesting as they are, did not cover a distance of much more than 20 miles, and that the peninsula measures some 200 by 130.

Signor Beccari, in a journey inland from the north coast a good deal further west, struck the river Wa Samson, there over twenty yards wide and four yards deep, which is said to rise in the Arfak* Mountains, and debouches to the east of Sorong. Other considerable rivers are, the Krabra, on the south coast, up which Captain Redlich sailed about 36 miles, and which was navigable for boats to an unknown distance beyond, and the Karufa, which debouches opposite to Adi Island, and whose course has been traced up a mangrove-covered valley for 30 miles into a more hilly country. All attempts to ascend the Mai Kassa, Katau, Aird, and the other rivers east of the Gulf of Papua, have been checked by barriers of fallen timber.

The only traveller who has actually crossed New Guinea is Dr. A. B. Meyer. In the course of his exploration of Geelvink Bay he landed at Rubi at the head of the bay, where he found a specially friendly and innocent people, and ascended the hills, which consisted of granite and ancient sandstone rocks, to the height of 2260 feet, where he found a plateau terminating on the other side in precipices and ravines which barred further progress. Beyond, extended parallel ranges of mountains with very narrow ridges. The population was very scanty. In the distance the sea was visible to the south, and towards the south-east, behind a mountain 4000 feet high, lay, he was told, a lake named Jamoor, the only one mentioned by any traveller, if we except the lagoons in the south-east. It lies near the south coast, with reedy banks thickly inhabited by a savage people, who have boats on the lake, and carry on trade with the south coast. Their attire must be singularly scanty, for it was commented on satirically by Dr. Meyer's not over-dressed companions! Returning to the sea, he sailed to the mouth of the Wapari river, and arranged to ascend it on his way across the isthmus to McCluer Gulf, but finding that it was not navigable he proceeded on foot, with considerable difficulty, owing to the objection of the natives to carry burdens. The road lay over a very steep wooded hill 1250 feet high, and after crossing this and another he struck the Jakati river, and descended it next day to the sea, passing several villages and the mouths of other streams which flow into the head of the inlet. Many people joined him as he passed, but always left him after going a few miles, being at war with the neighbouring tribe. The south coast of the inlet, where he passed the night, seemed uninhabited, the sago palm growing

* It is remarkable that Captain Armit mentions a tribe named Arfak at the other extremity of New Guinea.

everywhere in profusion. His return voyage was rendered difficult by the trees thrown down across the stream by a severe earthquake which occurred during the night.

Earthquakes and Volcanoes.—Terrific earthquakes have been experienced both in the north and west, but it is not yet known whether volcanoes occur on the mainland of New Guinea. They have been reported in the Arfak Mountains, and again east of the Amberno delta, and Mr. Powell found a mass of pumice at a considerable elevation on the coast opposite New Britain, which is the seat of tremendous volcanic activity. Dampier "saw smokes" here, at the cape he named "King William." In the neighbouring small islands, however, volcanic action appears to have diminished. Vulcan Island, by the light of whose fires Dampier in 1700 first steered through the straits to the southward, is described by D'Entrecasteaux in 1793 as merely "couronné de fumée," and by Dumont D'Urville, in 1827, as "complètement éteint."

Geological Formation.—In the north-west of New Guinea and the adjacent islands, the raised coral beaches, and the alternation of recent coralline limestones with ancient rocks stratified and volcanic, seem to argue recent upheaval. Along the north coast, too, there is no barrier reef, only fringing reefs shelving suddenly into very deep water. Of the geological features of the island generally little more can be said. The great submarine bank on the south coast, the peculiar conformation of the Aru Islands, from which Mr. A. R. Wallace ingeniously showed their former connection with the mainland, as well as an examination of Torres Straits and the land on either side, all indicate a recent southward extension and connection with Australia. The date of the separation may, from the identity of certain lower miocene shells at Hall Sound, on the east of the Gulf of Papua, with others of the same series found in Victoria and South Australia, be inferred to be not earlier than that period. In this connection too it may be mentioned that of the Amphibia of New Guinea, those which are not of wide distribution are exclusively Australian. As regards the other rocks of the eastern peninsula, it may be interesting, especially with reference to the recent search there for gold, which has as yet been found only in very small quantities,* to note that the pebbles and small fragments brought down from the interior, consisting of mica slate, quartz, sandstones, greenstone, and jasperoid rocks, show the formations there to be undistinguishable from the Silurian and Devonian series of the gold-fields of New South Wales. Rocks of similar age, with granite and gneiss, are also found in the interior of the north-west.

Clay ironstone has been observed at Humboldt Bay, on the Jakati river at the head of McCluer inlet, and at Lakahia Island; and a tertiary coal (lignite) at Lakahia Island and in Galewo Strait; a black magnetic iron-sand with traces of gold is found in the streams of

* Specimens of quartz examined yielded hardly more than 1 dwt. to the ton.

the south-east, and plumbago is also reported on this coast, and in the interior.

Islands of Geelvink Bay.—The great islands of Geelvink Bay have been visited, but by no means thoroughly explored, by Von Rosenberg, Meyer, and Beccari. Jappen (sometimes erroneously called Jobi from a place on its south coast) is the largest, being about 90 miles long. It has a central range with peaks some 2500 feet high, and is well wooded. Its southern coast is difficult of access, owing to reefs. The next largest, probably divided into two by a narrow channel accessible only for small boats, is sometimes called Schouten (a name which ought for clearness to be confined to the small group known as Schouten Islands 8 degrees further east), but more properly Mysore, or Korido. Its coasts consist of coral limestone, and the mountains in the interior of older formations, containing slaty and quartzose rocks. It is fertile, with abundance of tropical forest and water. Here, as in Jappen, and on the east coast of Geelvink Bay opposite, the people are wild and of very uncertain temper, and in the last two localities are said to be cannibals. On both islands the hill and coast people are at war, and the latter protect their gardens by sharp bamboo stakes hidden in the ground. Mefor is 1000 to 1500 feet high and densely wooded, but not very populous. A wide-spread tradition on the mainland derives the population there from this island, and the Mefor language or its dialects prevail, according to the missionaries, over a considerable part of Western New Guinea. It is not improbable that the islands of this bay, being a natural halting place for emigrants from the north and west, were a centre of population. Dr. Beccari indeed goes so far as to find in the Mefor physique and customs traces—interesting, but somewhat slight for argument—of an Indian or Caucasian origin.

Population.—Ethnological speculation would be out of place here, and perhaps adequate material for it is not yet forthcoming. It is usually stated that two types of man exist in New Guinea; the one, the Melanesian or so-called Papuan (which prevails with considerable modifications throughout the region extending from Flores on the west of New Guinea, as far east as New Caledonia and Fiji), occupying the bulk of the country; the other, a fairer and milder race, having decided affinities with the Polynesian, found on the south coast of the eastern peninsula. Members of the former division, however, differ widely in appearance in different parts of the island. Not only have they in some instances undergone great admixture, as e. g. on parts of the north coast, where the type has been refined and elevated by mingling with a superior and possibly Asiatic immigrant strain, but elsewhere (and not always in the more primitive interior, but at parts of the coast, as at Sorong in the north-west, and on the east side of Geelvink Bay), very degraded types are found. The fairer race equally shows signs of great admixture and deviation from the Polynesian type, though they entertain towards their

darker neighbours the same sense of superiority, not unmixed with fear, which characterises the genuine Polynesian. An amusing instance of this was seen in the contempt which they showed for some native teachers brought by the missionaries from one of the Melanesian islands, while welcoming others of Polynesian origin.

The Papuan is usually said to be a timid sailor, in contradistinction to the Polynesian, but the people on the north-west coast, as at Doreh and the neighbouring islands, are bold and capable seamen—another proof perhaps, of intermixture of race. Some peculiar customs may be mentioned which not only prevail among the Dyaks of Borneo, but may be traced at least as far as the north-east corner of India. Such are, a belief in certain malignant spirits of the clouds, the rocks by the sea, and the forest, akin to those of the mountain and forest worshipped by the Mishmis; * and the practice of taking and preserving the heads of enemies, in vogue among the Dyaks and among the Kukis of North-east India. (It may be observed that the Papuans also preserve the skull, and oftener the jawbone of a relative.) Again, the great house, many hundred feet long, and containing several families, is found in New Guinea, as in Borneo, and among the Mishmis and Nagas of Assam; the last-named having also, like the Papuans, separate houses for bachelors, and, unlike them, others for maidens. The Malay practice of building on piles is also common throughout New Guinea, even high up on the mountain sides. In the south-east stockaded villages are built on the steep spurs of hills, surmounted by a *dobbo*, which serves both as a watch-tower and as a refuge from enemies, human and spiritual. Houses are also sometimes, as at Astrolabe Bay, built on the ground, with very low walls, and projecting eaves reaching nearly to the ground, and a bench outside on which the meal and subsequent siesta are taken. This form of house, and the *dobbo* also, occur in the Melanesian islands to the eastward.

In some places houses have been found somewhat different in construction from those surrounding them, as at Humboldt Bay, where they are larger, higher, and of octagonal form, and ornamented outside with life-size figures of birds, fishes, and beasts. These have been, perhaps hastily, assumed to be temples, a view hardly consistent with what is known of the Papuan religion. Little has been found in them except musical instruments, as drums and flutes, and wreaths of scented grass. They may be akin to the *marea*, or council- and guest-house of the Pacific, but also they may be used, as are certain houses in New Ireland, for the reception of the *karwars* or ancestral images, which are apparently the only object of Papuan adoration or worship, and that only for a limited period after the death of the individual represented by the *karwar*. The religion of the people in the south-east peninsula is still more rudimentary, which is curious as bearing on their supposed affinity

* We need not, however, go as far as Dr. Beccari, to whom the name of *Manoin*, the powerful spirit of the Papuan forest, suggests the Indian lawgiver *Manu*!

with the Polynesians, for the chief distinction between the Polynesian and the Melanesian religions is that the former have attained a certain conception of powerful deities, embracing the necessity for a priesthood quite different from the Melanesian sorcerer. By both races the spirits of the dead are greatly feared, and the houses which they haunt, and beneath or near which they are buried, are deserted from time to time, as by women before childbirth, &c. Possibly the effluvia from the buried corpse produces the feeling of sickness supposed to be caused by the spirit's presence, and which subsides when the sufferer leaves the spot.

As regards the character of the people, the Papuan certainly has a bad name, but very large allowances must be made for reports spread by Malay traders in order to frighten away rivals, as well as for savage habits induced by ill-treatment and kidnapping for slaves. Although in many places wild, suspicious, and excitable, yet when treated with tact and patience, very friendly relations have been established with them. A remarkable instance of this was Mr. Miklukho Maklay's interesting narrative of his lengthened residence at Astrolabe Bay; and it is borne out by the experience of Captain Moresby and his ship's company, and also of Captain Armit's expedition.

The English mission schools, though only established a very few years, are attended by hundreds of children, whose brightness and intelligence is very remarkable, exceeding that of the adults. The people at the other end of the island are probably a ruder race, and, with the exception of the coast districts under the influence of the semi-civilisation of the Malays, at a lower stage of culture, and perhaps with less capacity for it. The Dutch missionaries about Geelvink Bay complain naively that their *protégés* are sadly lacking in ambition and discontent—those twin virtues which lie at the root of modern civilisation. Still, their labours have at least produced some conceptions of order, and increased material prosperity. The level of civilisation varies considerably, but the average Papuan, if a savage, is a savage of a high order. Although still in the "stone age," the artistic faculty is strongly marked, and perhaps more so among the western tribes than among the milder eastern. This is shown conspicuously in the carved ornamentation of their canoes, houses, implements, and weapons, and these tastes are further seen in the habit of adorning themselves with (among other things) flowers and leaves. Crotons and dracenas, coleus, begonias, and the scarlet hibiscus are thus used, and at Humboldt Bay an anise-scented clausena. They are also alive to the advantages of trade. The tribes on the western coasts have for centuries traded with Malays, Bughias, Chinese, and others, exchanging the products of the country, such as massoi bark, nutmegs, bird of paradise and other bird-skins, pearl- and tortoise-shell, tripang, and slaves, for cotton cloths, iron and copper wares, knives, beads, mirrors, indigo, and arrack.

They have also a good deal of inland trade among themselves. Thus the Wandessi, a tribe on Geelvink Bay, take massoi bark across to McCluer Inlet in exchange for sago, and the massoi is then sold to traders from Ceram. The savage hill tribes about McCluer Inlet in like manner come down to purchase sago, bringing nutmegs, which are then disposed of to foreign traders. Assuming apparently that intertribal war is the normal condition of man, they adopt ingenious devices to mitigate its inconveniences. For example, each of the above-mentioned hill tribes has its allotted trading station on the coast, but even thus collisions are not always avoided.

The people of the south-east peninsula make long voyages to the west of the Gulf of Papua for sago, in strange craft composed of several canoes lashed together, with a house at each end. There is also here an active trade between the hill and coast villages, the former bringing down vegetables and tobacco, and receiving fish, shell ornaments, &c., in exchange. A village or a district often has its speciality, e. g. for pottery, or for canoes, or shell or other ornaments. Salt, too, is greatly in demand, especially in the interior, sea water being sometimes carried up in hollowed bamboos, or it is obtained by burning the roots of trees which have grown in the salt water.

Among the natural resources of the country, besides minerals and the produce of the sea, such as pearl- and tortoise-shell, and tripang, are various kinds of timber, gums, barks, spices, and fibres, with such staples as the sago, sugar, and coco-nut. The people in most parts are skilled agriculturists, growing, generally with the help of artificial irrigation, all the usual plants of tropical Pacific culture, most of which—with probably the traditions of scientific agriculture—seem to be of Asiatic origin. Any one may clear and cultivate a piece of land within the territory of his tribe, but they have a strong sense of proprietorship, even of the fruit trees in the forest, and of the fish in their own streams, or on their own tract of coast.

Political and Social Condition.—Looking to the probable and not distant future, it would seem that the confidence of these people might best be gained, and the resources of the country developed to an indefinite extent by avoiding for the present any attempt to purchase or settle on tracts of land, which would almost certainly lead to complications; and by establishing depôts to which the people might be induced to bring their produce for trade, under proper regulations. Their own organisation, social and political, is quite rudimentary, as may be inferred from the small power possessed by the chiefs. Kingly authority, and graduated or hereditary rank, are Polynesian, and not Papuan conceptions. Important matters are settled by the assembly, and otherwise every man, beyond conforming to certain established customs, is a law to himself. As bearing on the question of annexation, it is at least satisfactory to feel that there are no national suscepti-

bilities which a foreign occupation could offend, and no political institutions which it need overthrow.

The Dutch Claims.—A good deal of misconception prevails as to the claims over New Guinea asserted in former times by certain Malay sultans, and recently by the Dutch. The earlier claims date from the spread of Islam in the Archipelago, and were put forward by the sultans of Batchian and G  b  , and latterly Tidore, whose first Mahomedan sultan conquered G  b   and succeeded to his rights, late in the fourteenth century. And with a single exception to be mentioned afterwards, any action which the Dutch have taken has been solely in the capacity of suzerain of the Sultan of Tidore. The claims of these little islands, mere specks on the map, over such a territory as New Guinea, seem at first sight—though perhaps it does not become an inhabitant of Great Britain to make such invidious comparisons—rather absurd; but they admit of a simple explanation. Our geography books talk of “Papua or New Guinea,” but the Papua or Tana Papua of these Malays merely meant the islands in their immediate neighbourhood inhabited by the dark frizzly-haired race, and had probably little or no reference to the great continental island beyond. The sovereignty in question is more especially defined as the “*Raja Ampat*,” i. e. the four (Papuan) kingdoms, to wit, the islands of Waigiu, Salawatti, Mysol, and Waigama, a district on Mysol Island.

A brother of the Sultan of Batchian held Mysol about 1610, and he too claimed supremacy over the *Raja Ampat*, but in his claim the term “Papua” was substituted for Salawatti. The Tidore claims on New Guinea indeed rest, perhaps, on nothing more substantial than an alleged supremacy over the Rajah of Salawatti, who in his turn claims a suzerainty over the island of Mefor, which has some settlements on the mainland near Salawatti! For the last two centuries, however, these claims have been acknowledged by the payment of a tribute of sago, massoi bark, bird-skins, and slaves, sometimes sent voluntarily, sometimes levied forcibly by the semi-piratical Tidore fleets, and by the acceptance of investiture at the sultan’s hands by some of the principal chiefs around the western extremity of New Guinea.

The Dutch seem to have first supported, and finally assumed as their own, the claims of their old rival and ally the Sultan of Tidore, in accordance with the system long practised by them in their dealings with the native rulers in the Archipelago: their only direct act of annexation in New Guinea, sanctioned or ordered by the Home Government, was in August 1828, when Commissary van Delden, by proclamation, fixed the limits of Dutch territory on the south coast at 141° E. long., the line running thence westward round the coast to the Cape of Good Hope in 132° 45’, reservation being made of the rights of Tidore to the four districts (*distrikten*) Mansarai, Karongdifer, Amberpura, and Amberpon. These same districts, it may be mentioned, were confirmed

to the Sultan of Tidore, as constituting his possessions on New Guinea, during our temporary occupation of the Moluccas in 1814. This at first sight seems conclusive as to the rights of Tidore over part of the mainland of New Guinea, but on examining the maps it appears that the said "districts" are not on the mainland but on adjacent islands. The Dutch proclamation contains besides a curious informality. It takes possession of the "coast of New Guinea," between the two points above specified, "and of the lands lying within," but it does not say how far inland the annexation is to extend; it could hardly, from the formation of the land, be intended to join the two points named by a straight line. Curiously enough, in Van der Goes's report of the Dutch commission which visited New Guinea in 1858, the proclamation is alluded to in a slightly satirical tone, and the writer declares he could not find a copy of it in the archives of Amboyna!

For the line now popularly considered to be the Dutch frontier line, and which traverses New Guinea on the 141st meridian, the only foundation appears to be a mere rescript (*besluit*) of the Governor-General of the Dutch East Indies in 1848, Van Rochussen, who defines, *proprio motu*, the rights of the Sultan of Tidore as extending along the north coast to 140° 47' E., and an enterprising map-maker must then have stepped in and completed the arrangement, by drawing a line from that point to meet the limit laid down in 1828 on the south coast, for it cannot be supposed that so scientific a frontier was drawn by so unscientific a potentate as the Sultan of Tidore. It is not very clear on what grounds our Government, in defining the jurisdiction of the High Commissioner of the Western Pacific over British subjects in islands not held by any civilised power, fixed its western limit at 143° E.; at all events it is clear that no valid act of annexation was performed by Van Rochussen in 1848, nor probably was any such act intended. It is true the rights of Holland are declared (by this local authority) to extend to this point on the north coast, in her capacity as suzerain of Tidore; but her right to interfere directly in the administration is expressly stated to derive its validity solely from the connection with Tidore; and even the lesser rajahs along the coast, with whom the Dutch have made agreements, consider these to exist only in virtue of the same relationship. Now, first, there is abundant evidence that to the east of Geelvink Bay the natives either repudiate the rights of Tidore, or are ignorant of his existence; and secondly, his rights, which never extended far inland, could hardly be the basis for the annexation of an inland territory 400 miles across; besides which, the definition of his rights above quoted deals expressly and exclusively with the coasts, from the point mentioned on the north coast westward, and round to that named on the south.

A small coaling depôt exists at Doreh, and poles supporting the Netherlands arms have been erected along the coast, but the only serious

act of occupation was the erection of "Fort Du Bus" at Triton Bay; this, however, was abandoned in 1835, i. e. fifty years ago, and could hardly therefore be held to constitute possession at the present day. Dr. A. B. Meyer, in 1873, before starting on his journey, applied for protection while in New Guinea to the Resident of Ternate. He, however, replied that he could give him none; that there were no Dutch officials anywhere on New Guinea, and that even the missionaries were independent of the Dutch Government, and not protected by it; and he added that Dr. Meyer would have the right of life and death both over the natives and over his own attendants. It seems probable that the slight show of possession hitherto kept up by Holland may, except perhaps as regards the western peninsula, be read as signifying no definite annexation, but merely a provisional claim in case of her becoming able, which she probably at one time contemplated, to undertake the development of this vast region; or it may simply represent the survival of a state of matters now past or passing away,—a caution to all unlicensed traders to the New Guinea coast, and a barrier against intrusion from the east into her Moluccan preserves.

Various points in East New Guinea have at times been annexed by British commanders, and all that region seems now, from the force of circumstances, tacitly assumed to be English territory. This is not the place to discuss whether such a tenure is quite satisfactory; it seems, however, pretty evident that New Guinea must eventually take its place as a member of a great Anglo-Australian political system, for whatever nations may contribute their quota to its development, the vast preponderance both of men and capital engaged will be English. It is hardly necessary then to allude to the grave inconvenience and permanent injury to the harmonious political development of the said system, which would be caused by the presence of hostile or incongruous elements in one of its component parts. A vast increase of military expenditure would be one of the least of the drawbacks; there might also be the neighbourhood of a foreign convict settlement; the entire question of the protection of the natives, too, would pass from our control; while the valuable pearl and tortoise-shell fisheries on the coasts would become a source of much inconvenience if not kept under one jurisdiction. And it may be remembered that the rapidly increasing trade of Australia with Europe and India through Torres Straits, and with China by Captain Moresby's route, are both commanded by New Guinea. Australia, however, though she has expressed herself unmistakably as to bad neighbours, and may be trusted to give effect to her wishes, does not shrink from good ones, and would be last to deal graspingly with a gallant little nation like the Dutch, whose energies in proportion to her resources are so admirable, and from whose administration of a tropical dependency even Englishmen, with all their experience, may take some valuable hints.

Since this paper was in type, the Society has had the pleasure of listening to Mr. Markham's luminous essay on the explorers of New Guinea, treated mainly from an historical and biographical standpoint, which, the present writer hopes, will lend some additional human interest to the comparatively dry details now submitted.

Recent Explorations in South-Eastern New Guinea.

By the Rev. W. G. LAWES.

Map, p. 244 (Inset Map).

I HAVE the pleasure of forwarding to you with this two tracings of maps describing recent journeys of my colleague, the Rev. J. Chalmers. The first was that to the Gulf, and was made in one of the large native trading vessels. The district west of Maclatchie Point is but little known, and before Mr. Chalmers's visit had never been visited by a white man. The natives of Port Moresby make periodical visits to it for sago and canoes. Many and marvellous were the stories of this cannibal territory, its horrors and its wonders. All, however, gave the people, cannibals though they are, a good name for kindness and hospitality.

Until this year no opportunity has offered for visiting them. Mr. Chalmers, who has travelled more than any one else in New Guinea, and seen more of its tribes, was particularly anxious to add this district to those he already knew.

A large fleet of trading canoes left Port Moresby and neighbourhood for the west last October, and in one of these Mr. Chalmers took his passage. He landed at Maclatchie Point, and from there made a number of journeys and voyages to the west. He found the people generous and hospitable. They are certainly cannibals, but only as concerns their enemies. Sorcery and superstition have their home amongst these tribes. One *dabu*, or sacred house visited, is described by Mr. Chalmers as the finest he has ever seen. Two large posts, 80 feet high, support the large peaked portico which is 30 feet wide, while the whole building is 160 feet in length, and tapers down in height from the front. A large number of skulls of men, crocodiles, cassowaries, and pigs ornament it. The human skulls are those of their victims who have been killed and eaten by them. They speak of this as the greatest luxury, and think those are fools who despise it.

The whole district from Orokolo to Panaroa is one great swamp, the villages all surrounded by the muddy water. Canoes are a necessity in making morning calls; bridges of logs or trunks of trees form the streets, and the roads are more easily traversed barefoot than in boots. The houses are really well-built, and in front of many of them are small gardens, raised ten feet from the ground. In making them, a well-built

platform is covered with soil, in which flowers and tobacco are planted and cultivated, the whole carefully fenced.

From the natives Mr. Chalmers learnt that the Alele, Aivei, and Panaroa are the mouths of one and the same large river, which unite about five miles inland. He himself went up the Alele to its junction with the Aivei. This large river he named the Wickham. He is strongly of opinion that the Wickham, the Aird, and other rivers about Bald Head, are a part of the Fly, or rather that they are all mouths of one large river, of which the delta extends from the Alele to the Fly. Large lakes may be found, of which these large rivers are the outlet. There is no river of any size on the opposite part of the northern coast, and the drainage of the north side of the Mount Owen Stanley range is unknown.

To solve all these questions would be a most worthy object of geographical exploration. The Wickham and Aird have never been ascended beyond a few miles. A good steam-launch in capable hands might do much good work in this district.

You will have heard of the two newspaper expeditions for the exploration of New Guinea. The *Argus* and *Age* of Melbourne both sent this year correspondents at a great expense. Captain Armit was the representative of the *Argus*, and being a Fellow of your Society, has probably sent you an account of his travels. He left the coast on the 14th of July, and went in a north-easterly direction to Sogeri (Sogere), of which place I sent you an account last year,* when Mrs. Lawes, Mr. Chalmers and I visited it. He made this for some time his headquarters, visiting from there the surrounding district. After leaving Sogeri, he travelled in a south-easterly direction, until he was compelled by fever and the death of his fellow-traveller, Professor Denton, to return. His farthest point was about lat. S. $9^{\circ} 35'$, long. E. $147^{\circ} 38'$, i. e. 39 miles in a straight line from Port Moresby, and about 22 from the sea-coast at the nearest point.

Mr. Chalmers has been the farthest yet into the interior. He has been as far as lat. S. $9^{\circ} 2'$ and long. E. $147^{\circ} 42\frac{1}{2}'$, so that the English flag has travelled farthest inland in the hands of the missionary.

The *Age* expedition took a more westerly course than Captain Armit. Mr. Morrison, who conducted it, left here on the 21st July. He took horses, and after a very difficult and trying journey, he reached the point on the Goldie river marked on the map I now send, "Junction." Here he was attacked by natives, and wounded. He was obliged to return, and reached Port Moresby on the 14th of October, his party hungry, fever-stricken, and disheartened. As the inland natives have always been friendly, and the very best of all tribes to travel amongst, we were anxious to know the real cause of attack, and also, if possible, to restore the former friendly relations. With this object, Mr. Chalmers left this on the 4th of this month (December), intending to go to Varigadi, from which place the attacking party were known to have come.

It was late in the season for inland travel. Mr. Chalmers found both

* 'Proceedings,' 1883, p. 355.

the Larogi (Laloki) and the Goldie much swollen, and running with a very strong current. On the third day his party camped about five miles from the place where Morrison was attacked. They left his track there, and took a more easterly direction to the villages of Varigadi. The villages were there sure enough, but empty and deserted. Soon after the attack on Morrison, the natives all left, and went to Eikiri, a district further to the east. They shared the plunder of Morrison's goods with the Eikirians, and so secured their favour. After some weary hours of search for signs of human life, Mr. Chalmers and party returned to their camp of the previous day.

From the Nagila people who live about half-way to Varigadi, they got the following information, which may be relied on as correct. There was no trouble with the foreigners until a tomahawk was stolen: this was returned, and next day a knife was stolen. Morrison shot the thief as he was running away. He happened to be the son of the Varigadi chief Gomaradaure, a man who has always been friendly with the white man, and who warned Morrison to return by laying a spear and shield on the road in front of him. The friends and companions of the young man attacked Morrison in revenge, but it was not a united attack, neither was any other tribe involved in it. The goods of the party were left behind when they retreated, and to these the natives helped themselves.

The country about Varigadi is exceedingly rough, and travelling very hard and difficult. This is one route to Mount Owen Stanley and was thought to be the best approach for the ascent of that grand mountain. But it is far too rugged and seems indeed to be impracticable. The easiest way of getting to the base of the mountain is by Doura, which can be reached by water, and is an extensive tract of level country.

Mr. Chalmers was accompanied on this trip by my son, Mr. F. Lawes, who took the positions marked on the map I now send you. They were from cross bearings taken with prismatic compass from well-known points. He was also accompanied by Messrs. Lawrie and Horsley, two young gentlemen on a visit here. They were all back at Port Moresby on the morning of the 11th, having been absent a week. They walked about 100 miles, rested on the Sunday, and did in the one week what occupied Morrison three months.

No well-organised party need fear anything from the natives in the Koiari district. They would find them everywhere friendly and helpful. I should have said above that the young man shot by Morrison is not dead, but may recover.

The rainy season has now fairly set in, and until next May at the earliest it would be folly to attempt travelling in the interior. With kind regards, I am, &c.,

H. W. BATES, F.R.S.

W. G. LAWES.
Port Moresby, New Guinea,
December 19th, 1883.

GEOGRAPHICAL NOTES.

The Volcanic Eruption of Krakatau.—The article on this subject in the March No. of the 'Proceedings' was written by Mr. H. O. Forbes.

Mr. Wilfred Powell's New Guinea Expedition.—We are informed that this expedition is not likely to set out during the present season, owing to sufficient funds not having been secured to meet the expenses.

Mr. W. M. Ramsay's Explorations in Asia Minor.—Our Council have voted a contribution of 100*l.* to the "Asia Minor Exploration Fund," raised in 1882, to enable Mr. Ramsay to pursue his important topographical and arohæological researches in Asia Minor. The committee who administer the fund announce that 500*l.* is required for the continuation and completion of Mr. Ramsay's work.

Cambridge Local Examinations.—Award of Geographical Prize Medals.—The two Silver Medals offered annually by our Society for geographical proficiency to the authorities of the Cambridge Local Examinations have been awarded this year as follows:—The medal for Physical Geography to Gertrude Frances Crosby; for Political Geography to Sidney Albert Playne.

Lake Bahringo.—Mr. A. M. Mackay, writing from Smith's Creek, Victoria Nyanza, says, with reference to Mr. Joseph Thomson's announced intention of reaching Lake Bahringo, that from all he can learn from the Ba-ganda, who penetrate far to the east of Bu-soga in their yearly raids, there is no lake of that name. He says the idea of a lake in that direction, derived from the meaning in Arabic of the word *Bahr*, arises from a mistake. The word is *Baringo*, which means "the people of the leopard," and refers to a tribe, not to a lake; *Ba* being the prefix (corresponding to *Wa* in Ki-swahili) used by all tribes to the north of Victoria Nyanza, and *ngo* meaning "leopard" in Ku-ganda; the *r* being merely a euphonic letter. The Ba-ganda have told Mr. Mackay of a tribe in that quarter whom they call Ba-ringo, because they wear leopard-skins in war. Similarly they speak of another tribe in the same neighbourhood called "Ba-mporogoma," because they wear lion-skins—*mporogoma*, lion.

A Steamer on Lake Tanganyika.—The sections of the London Missionary Society's steamer, *Good News*, were safely delivered to Captain Hore, at Liendwe, on Lake Tanganyika, on the 8th of October last. The arduous task of conveying the steamer by land from Nyassa to Tanganyika was undertaken and personally carried out by Mr. Frederick Moir, one of the managers of the "African Lakes Company," who have been for some years engaged in mercantile operations on Lake Nyassa. From Karonga on the north-western shore of Nyassa to Pambete, the nearest port on Tanganyika, by the road taken by Mr. Moir and his large party of native porters, is 292 miles, a distance accomplished in

thirty-one days. At Pambete the land transport ended, the sections being carried by water the further distance of 30 miles to the harbour of Liendwe, where Captain Hore has his sheds and workshops all ready for the mounting of the steamer. In letters which Mr. Moir has sent to his family in Edinburgh, the road between the lakes is described as level for the most part, i. e. after the plateau is reached from the lake level. Villages and their corresponding chiefs occur at every ten or twenty miles, each strongly defended by a deep ditch and stockade for fear of the marauding Wa-hemba tribe. Food was very scarce, and Mr. Moir and his party suffered much from hunger.

Expedition through the Shan Country.—Mr. Holt S. Hallett, *c.z.*, whose projected journey of exploration through the Shan States to Ssumao was briefly noticed in our number for February last, p. 91, writes from Hlaing-Bhwai (or Hlineboay), British Burmah, under date of 22nd January last, announcing his intended start for Zimmé on the following day. From Zimmé he intends first to proceed to Kiang Tsen on the Mekong or Cambodia river, then south-east to the eastern sources of the Menam and down the valley of its eastern branch to Muang Phey and Muang Nan, over country which has not as yet been visited by Europeans, and then across by Lagone (or Lakhon) and Labong to Zimmé, where he hopes to arrive about April 15th. After staying there a week, he proposes to go slowly down the Meping and Menam to Bangkok, collecting information, and on his arrival hopes to meet Mr. A. Colquhoun, with whom he intends to go over a great part of the delta during the rains, with the object of selecting the best direction for a railway. As the greater part of this country also has not been visited or described by Europeans, the results will doubtless be interesting. From his present experiences, Mr. Hallett is convinced that the geography of the region above the delta of the Salween, as shown on all our maps, is very faulty—ranges being shown where only isolated hills exist, and many hills left out.—In a subsequent letter dated January 30th, he announces his safe arrival at Meh-tha-wah on the Siamese frontier, having so far settled in a satisfactory way the question of the feasibility of a railway, and having found from his surveys and heights taken all along the route, that the maps are all incorrect. He had on that day been joined by the Bombay Burmah party referred to in our former notice, with eleven ponies and ten elephants, the two camps being close together. At the Siamese guard-house, he found a missionary with his wife and daughter, who had been kept there for thirteen days for a relay of elephants; and as neither his own nor the Bombay Burmah party could take their elephants beyond Minelonghee, where they would have to be replaced, some delay seemed probable. Advantage of the halt was taken to measure the river and secure photographs: the scenery is described as very fine, and animal life seemed abundant, from the frequent tracks of tigers and cries of deer, but available provisions were running rather short.

GREELY RELIEF EXPEDITION.

WE have been favoured with an advance copy of the Report (about to be issued in Washington) of the Board of Officers appointed to consider an expedition for the relief of Lieut. Greely and his party, from which we extract the following memorandum, supplied at the request of the Board, by Sir George Nares, Capt. Markham, and Major Feilden. The valuable suggestions of these officers are likely to influence much the plan of the Relief Expedition, the more so as General Hazen, the President of the Board, reports that they coincide so nearly with the Board's own recommendations.

LONDON, 1st February, 1884.

*To the President of the Board for the relief of the Lady Franklin Bay
Greely Expedition, Washington:*

SIR,—In response to the invitation transmitted to us by His Excellency the Minister of the United States in London, we have the honour to submit for consideration the following suggestions, which may prove useful in drawing up the instructions for the guidance of those intrusted with the conduct of the expedition about to be despatched for the relief of Lieut. Greely and his party.

To ensure success, the expedition must, in our opinion, be thoroughly and efficiently equipped, competently commanded, and, above all, be under the direct auspices and supervision of the Government.

We would strongly deprecate the despatch of an expedition that was to combine any other object, such as whaling, with that of the primary undertaking.

In the first place, we are very strongly of opinion that the main relief party should consist of two ships; one of these should be engaged in advance, in the actual search, proceeding, if necessary, as far north as Discovery Bay; whilst the other should be used as a depôt ship, placed in such a convenient position that, in case of accident to the advance ship, there would be no necessity for her crew to retreat to the Danish settlements in Greenland.

In such an eventuality, the officers and men of the ship destroyed would merely have to fall back upon their consort, from which sledging expeditions would be despatched in quest of Lieut. Greely and his party.

Both these ships should be fully equipped for ice-navigation; should, of course, be steamers, but possess sail power as an auxiliary.

They should be provisioned for at least two years, and should be provided with complete sledging equipments, which should certainly include pemmican and other provisions generally used by sledging parties.

Too much care cannot be taken in the selection of provisions of a suitable nature, but the experiences derived, in connection with this matter, from recent American Arctic expeditions can leave little to be desired. It appears to us that the possibility of adding frozen meat to the general stock of provisions should not be overlooked.

We think there is a great probability that Lieut. Greely's party has already left Discovery Bay. Adopting this view, one of the ships should, we think, be despatched as early as the 1st of May, 1884, certainly not later, with orders to proceed to Godhaven, in Greenland, and to push on as early as possible to Upernavik, so as

to meet Lieut. Greely should he have succeeded in finding his way south to any of the Danish settlements.

If he has not done so, it is quite possible that he may have passed the winter somewhere between Cape York and Life-Boat Cove. It is therefore very desirable that this region should be searched early in the season.

There are two ways of carrying out this duty: either by sending a special Government vessel independent of the main relief expedition, or by inviting the co-operation of the whaling vessels. The latter should in any case be requested to keep a good look-out for the party journeying south in boats. However, should one of the whaling vessels meet them the captain would, by returning with them to the south, necessarily have to give up his chance of making a successful fishing voyage. It is, therefore, worthy of consideration whether the vessel that communicates with the Greenland settlements early in the season should not be ordered to proceed to the northward through Melville Bay, with the whaling vessels, at the first breaking up of the ice. If Lieut. Greely's party is not fallen in with near Cape York, it would then be the duty of the commander of the vessel to diligently search the Cary Islands and the coast line to the northward, prior to the arrival of the main relief party; every endeavour being made to communicate with the Eskimos of those regions, who will be sure to have tidings of the absent party, should they have been in the vicinity.

The two main relief vessels should time their arrival at Upernavik about the first week of July, and in the event of no tidings of Lieut. Greely's safety being forthcoming at the Danish settlements they should proceed to the northward in company.

Failing intelligence of the party having been obtained on the Greenland coast north of Cape York, including Littleton Island, Cape Isabella should be visited, and the cairn on the summit of that headland examined.

Supposing that no tidings or traces of the missing party are forthcoming at the entrance to Smith Sound, it will then devolve on the commanding officer of the relief expedition to organise further plans for prosecuting his search through Kennedy Channel, even if necessary, to Discovery Bay.

In such an event it appears to us essential to consider the course of action that would probably have been pursued by Lieut. Greely up to the present date.

What Lieut. Greely's views were in August 1881, may be gathered in some measure from his letter to the Chief Signal Officer, U.S.A., dated Fort Conger, August 17, 1881,* which was brought back to the United States by the S.S. *Neptune* [*Proteus*], after her successful voyage with the members of the international expedition to Discovery Bay in the autumn of 1881.

Lieut. Greely, in that communication, appears to have fully recognised the contingency that the relief ship of 1882 might not be able to reach Discovery Bay; but it does not quite appear that he realised the possibility of the ship not making good her passage to some point on the east coast of Grinnell Land (west side of Kennedy Channel) where at some prominent point he recommended a depôt † should be landed.

He further requested that a similar depôt to No. A might be placed on Littleton Island, and a boat at Cape Prescott, to enable his party to retreat across the waterway between that point and Bache Island, and thence to Cape Sabine.*

He evidently contemplated that under every circumstance "Depôt No. A" would

* Sig. Ser. Notes, No. X., pp. 22, 23, Washington, 1883.

† For contents of this depôt (A) *vide* Sig. Ser. Notes, No. X., p. 22, Washington, 1883.

be placed in the autumn of 1882 at least as far north on the shores of Grinnell Land as Cape Hawks.

His views as to the relief to be afforded in 1883 are thus expressed in the above-quoted communication :

“ If the party does not reach here (Discovery Bay) in 1882, there should be sent, in 1883, a capable, energetic officer, with ten (10) men, eight of whom should have had practical sea experience, provided with three whale-boats, and ample provisions for forty (40) persons for fifteen months. In case the vessel was obliged to turn southward (she should not leave Smith Sound, near Cape Sabine, before September 15th), it should leave duplicates of depôts A and B, of 1882, at two different points, one of which should be between Cape Sabine and Bache Island, the other to be an intermediate depôt, between two depôts already established. Similar rules as to indicating locality should be insisted on. Thus, the Grinnell Land coast would be covered with seven depôts of ten days' provisions, in less than three hundred miles, not including the two months' supplies at Cape Hawks.

“ The party should then proceed to establish a winter station at Polaris Winter Quarters, Life-Boat Cove, where their main duty would be to keep their telescopes on Cape Sabine and the land to the northward.

“ Being furnished with dogs, sledges, and a native driver, a party of at least six men should proceed, when practicable, to Cape Sabine, whence a sledge party northward, of the two best fitted men, should reach Cape Hawks, if not Cape Collinson.”

It is clear, therefore, that whenever Lieut. Greely decided to retreat from Discovery Bay his plans would be based on the supposition that Depôt No. A of 1882 had been placed at or to the northward of Cape Hawks; that a large supply of stores would have been cached at or near Cape Sabine, and that a relief party would winter at Life-Boat Cove in the winter of 1883-84, even if the relief ship had turned south in the autumn of 1883.

The results of the relief expeditions of 1882 and 1883 may be briefly summarised as follows :

On the 10th of August, 1882, the steamer *Neptune*, with a relief party and stores on board, reached her most northern point in Smith Sound, latitude 79° 20', being 12 miles from Cape Hawks and 17 from Cape Prescott, but was there stopped by the ice. The record * of the voyage shows that from the above date to the 28th of August, 1882, repeated but unsuccessful attempts were made to reach Cape Hawks. On the morning of the 31st August a landing was effected on Cape Sabine, western side of Smith Sound, and there stores and a whale-boat were placed (presumably Depôt A), but no distinct mention is made as to the amount of provisions left. On the 3rd September, 1882, Mr. W. M. Beebe succeeded in landing stores on Littleton Island (presumably Depôt B), and the *Neptune* then turned homeward.

In 1883 the steamer *Proteus*, carrying Lieut. Garlington, U.S.N., relief party and stores, rounded Cape Alexander at the eastern entrance of Smith Sound on the 22nd July, and entered Pandora Harbour; that same afternoon Smith Sound was crossed to the western side and a landing made at Payer Harbour, in the vicinity of Cape Sabine. Lieut. Garlington satisfied himself that the stores left there from the *Proteus* [*Neptune*] in 1882 were in good order, though the whale-boat had been slightly damaged by bears. At 8 P.M. on the evening of the 22nd July, the *Proteus* was again under way, and attempted to force a passage to Cape Hawks; she was, however, caught in the ice-pack, crushed, and sunk early on the morning of the 23rd July, 1883, between Cape Sabine and Cape Albert.

* Sig. Ser. Notes, No. V., Washington, 1883.

Lieut. Garlington, assisted by Lieut. Colwell, U.S.N., succeeded in saving some stores from the *Proteus*, out of which some 500 rations were cached by those officers about three miles west of Cape Sabine.

The relief party and crew of the *Proteus* then crossed the sound to Littleton Island, which they reached on the 25th July. From there they started southward in their boats for the Danish settlements in Greenland, reaching Upernavik on the 24th August, 1883, after a most fortunate boat-voyage, entailing, however, great exposure and suffering on the party.

There has been, therefore, no depôt of provisions, stores, or boat established anywhere north of Cape Sabine since Lieut. Greely's party arrived at Discovery Bay in 1881; so, whilst retreating along the east coast of Grinnell Land to Smith Sound, their only means of subsistence, until reaching Cape Sabine, would be the supplies brought away with them from Fort Conger, the animals procurable on the journey, and the depôts left behind by the British expedition of 1875-76.

When, in the autumn of 1882, the party at Discovery Bay realised that relief had failed to reach them that year, Lieut. Greely would at once husband his remaining stock of provisions. Discovery Bay being a peculiarly favourable position for procuring musk oxen, he in all probability eked out his subsistence with a considerable supply of meat. Consequently, if he decided to start southward from that station in July 1883, as we think he would, and run the risk of passing the relief ship on her way north, it may reasonably be hoped that the party had with them a large supply of food, dependent of course on the capacity of the boats at their disposal.

The first difficulty would be to cross Lady Franklin Sound, 10 miles wide, but, provisions advanced in the spring of 1883, this part of the journey would probably be accomplished before the first week of August. By that time Kennedy Channel would be comparatively free of ice, and few troubles need be expected while proceeding south along the shore of Judge Daly Promontory. In latitude 80° 5' N. the British expedition left a cache of 240 rations, sufficient to last Lieut. Greely's party for at least ten days; with this supply, in addition to his own resources, he would be the better able to face the forty miles of the route before reaching Cape Hawks in latitude 79° 30' N., where, although he would not find the expected Depôt A, he would find a boat and a supply of biscuit left there by the British expedition. The party would then be sixty miles from Cape Sabine, where they knew that a cache of 240 rations had been left by the British expedition, and where, in addition, we now know he would find the stores left by the *Proteus* [*Neptune*] in 1882, besides a whale-boat, also the 500 rations left by Lieut. Garlington and Lieut. Colwell, three miles west of Cape Sabine, in 1883.

Reaching this position would probably be the most difficult part of the journey, but once at Cape Sabine, and strengthened by this supply of provisions, and supplemented with an additional whale-boat, it would be an extraordinary misadventure if an opportunity did not offer in the fall of 1883 for the party to cross over Smith Sound and reach the neighbourhood of Littleton Island. No doubt extreme disappointment would be felt when the absence of a relief party and want of a winter station at Life-Boat Cove (*Polaris* winter quarters) was discovered; but as, in all probability, Lieut. Garlington's record announcing the loss of the *Proteus* would have been found at Cape Sabine, the disappointment would have been in a great measure anticipated.

Once arrived at Littleton Island, with the help of the depôt left there in 1882 by the *Proteus* [*Neptune*], and with assistance from the Eskimos of Etah, there is no reason why the winter of 1883-84 should not be passed in safety.

If, on the other hand, Lieut. Greely and his party, owing to contingencies, such as sickness, may have determined, rather than risk the hazard of a boat-journey in 1883, to chance the arrival of a relieving ship at Discovery Bay in the fall of 1883, and have remained there, the position of the party, though precarious, is not, we think, by any means hopeless.

With the addition of supplies of musk oxen, birds, hares, and perhaps a few seals, we may hope that they will not be absolutely without supplies before August 1884.

The relief of Lieut. Greely's party differs in one vital respect from the Franklin search expeditions. In that case, expedition after expedition was pushed into an unknown area; the uncertainty of where Franklin had been lost intensifying a hundredfold the difficulties of the quest.

Now there is a definite objective to strike for, and the difficulties to be overcome are those arising from the forces of nature in the Polar world, but in a comparatively well-known area.

We will now suppose that the search of the relief expedition of 1884, between Cape York and Littleton Island and Cape Isabella, has proved fruitless; in this event the commander of the expedition would naturally attempt to reach Cape Sabine, and there will probably be no very great difficulty in his making good a landing at that point.

If Lieut. Greely's party is not found there, then only two conclusions can be arrived at: either they are still at Discovery Bay, or else the party has met with misfortune in its attempt to retreat southward.

In this case the *dépôt* ship should move into Payer Harbour; the other ship should take advantage of any favourable movement in the ice, and, keeping to the land water, *always carefully avoiding the main pack*, proceed northwards. Patience and skill would, there is little doubt, be rewarded in the end, and it may reasonably be hoped that an opportunity of gaining Discovery Bay will offer itself during the navigable season of 1884.

The east side of the entrance to Smith Sound, after being carefully examined for traces of the missing party, should be shunned, particularly during strong south-west and west winds, for those are the winds that give favourable opportunities of reaching Grinnell Land and proceeding northwards, along the eastern coast.

As a precaution, in case of an accident to the advance ship and her crew having to retreat by land, *dépôts* and a boat should be placed at or near Cape Prescott, and some other points further north, as proposed by Lieut. Greely.

It may be suggested, if not already provided for, that great advantage would accrue from heliography; a pair of instruments, therefore, on both ships, and a trained operator in each vessel, might be of the greatest service.

We now arrive at our final consideration: Supposing the advance ship is unable during the navigable season of 1884 to reach Discovery Bay, or to find Lieut. Greely's party along the coast of Grinnell Land, its fate must be ascertained.

The *dépôt* ship should find winter quarters, not later than the 1st September, in the safest and most convenient station near Payer Harbour, on the west side of Smith Sound; this would enable her sledge parties to start early in the spring of 1885, along the east shore of Grinnell Land, and with those from the advance ship, complete the search of the whole coast line. Payer Harbour itself has the disadvantage of being somewhat too exposed a station for winter quarters, but the leader of the expedition may be safely intrusted to decide that point. Port Foulke or Pandora Harbour offer more eligible wintering stations than Payer Harbour or any other known place in its vicinity on the west side of Smith Sound, but wintering on the Greenland side of the sound would involve uncertainty in the despatch of the sledge parties

along the shores of Grinnell Land in the spring of 1885, for it must be borne in mind that the ice in Kennedy Channel is not to be relied on remaining unbroken during the winter months, and is certain to break up early in the spring.

No dependences should be placed on detached boat relief expeditions, except in the extreme case of the advance vessel becoming disabled early in navigable season of 1884, for no boat party can, in addition to the provisions necessary for their own support, convey sufficient supplies to relieve a large distressed party of men, and return with them to their station.

Too much reliance should not be placed by such parties on the natural resources of the shores of Grinnell Land. But although the British expedition of 1875-76 did not actually meet with any musk oxen, reindeer, or bears, between Port Foulke and Discovery Bay, traces of them were seen, and with good fortune a retreating boat party might come across some of these animals, walrus, or a few seals. After leaving the warmer waters of Baffin Bay, the great breeding haunts of sea-fowl are left behind. Port Foulke is the most northern summer haunt of the little auk, where it breeds in countless numbers, and contributes largely to the summer food of the Eskimos of Etah. Neither does Brünnich's guillemot, the well-known Arctic loom, extend its breeding range beyond the entrance of Smith Sound. Along the shores of Grinnell Land a few black guillemots nest, but not gregariously. At certain localities, such as the more protected bays, a few eider ducks will be found, whilst on the fresh-water lakes a considerable number of brent geese rear their young. None of these birds are to be obtained without an expenditure of time beyond the capacity of travelling parties, with whom delay means consumption of the stores they are carrying with them. The bird life of that region will not afford to sledge or boat parties more than an occasional addition to their rations, and cannot be reckoned on as a certain means of subsistence, such as the loomeries and aukeries of Baffin Bay afford during the breeding season of those birds.

In conclusion, we think it would be advisable to obtain the good-will and assistance of the Cape York district Eskimos by the timely and judicious distribution of presents, and the leader of the relief expedition should receive directions to this effect. Finally, we are desirous of expressing our heartfelt sympathy with the United States regarding the object of the contemplated expedition, and our readiness to afford, at any time, any information or assistance that it may be in our power to render.

We have the honour to be, sir, your obedient servants,

G. S. NARES, *Captain R.N.*

A. H. MARKHAM, *Captain H.M.S. "Vernon."*

H. W. FEILDEN, *Major H.B.M. Army.*

Obituary.

Earl Somers.—By the death of the Right Hon. Charles Earl Somers, which occurred on the 27th of September last, the Society lost one of its oldest and most respected members, who in his early years had made a prolonged, and at that time a remarkable, journey in Western Asia, a journey which produced fruit in the stimulus it gave to the spirit of investigation, by excavation, of the sites of ancient cities and temples. Lord Somers took a most lively interest in these studies, and in the geography of classical lands. He was born in 1819, and was educated at Harrow and Christ Church, Oxford. He became a Fellow of our Society in 1839, and served afterwards twice on the Council—in 1846 (as Viscount Eastnor) and again in 1855. He was for some time a Trustee of the British Museum and of the National Portrait Gallery. We are indebted to one of his relatives for the following outline of his travels, which occupied the greater part of three years, from 1841 to 1843.

After staying a week or two in Constantinople, he passed to the southern shore of the Sea of Marmora, and went on to Brussa, where he explored at leisure the Bithynian Olympus and some of its numerous picturesque villages, making an interesting collection of the mountain plants of the district, which passed into the herbarium at Kew. Proceeding southward and crossing the Tumanji range, he reached Phrygia by the Kutaya line of road, making for Tcherdur, the site of the ancient city of Azani, where was then and still may be seen a temple of Jupiter, which is the best preserved example of the Doric order of architecture of all that are extant. Accurate measurements were taken, and a plan made of this fine monument, which were published in the *Builder* of 7th September 1847. At that time many other most interesting remains existed at Azani, comprising three bridges over the Rhyndaous with arches intact, a theatre, a stadium, and many tombs. From Azani, progressing southward by the valley of the Hermus, Lord Somers traversed and examined that curious volcanic country which was called by the Greeks Katakcaumene, visiting thereafter the sites of ancient Philadelphia, Hierapolis, Laodicea, and Colosse. The picturesque province of Caria, abounding in fine ruins, was next explored, beginning with the sites of Antiocheia and Aphrodisias, on the flank of Mount Cadmus, and continuing through Alabanda, Alinda, Labranda, Stratoniceia, Mylassa, Halicarnassus, Myndus, Iassus, Didyma, famous for its temple of the Branchidæ, and Miletus, with its splendid theatre. At Halicarnassus daguerrotypes were secured of the bas-reliefs which were built into the walls of the castle of Budrum, whereby for the first time certainty was acquired that they belonged to the celebrated tomb of Mausolus. Lydia was then entered, and all the chief sites visited. Soon after the Mysian sites of Pergamus, Adramyttium, Antandrus, Gargara, Assos, and Alexandria Troas were passed through, leading to the Troad, where all the noteworthy points were examined, and some excursions made into the valleys of Mount Ida. Gaining the Dardanelles, steamer was then taken to Constantinople.

A Greek schooner was here hired for an excursion in the Archipelago. Arriving at Telmissus, in Lycia, land travelling was resumed, and the principal sites in the southern region of that country were visited. Thereupon proceeding along the Cilician coast, Pompeiopolis (Soli) was reached, and then Tarsus, after a very interesting exploration among the fine tombs which are so numerous in the region of Coricia Caverna. The Issic Gulf was crossed by boat, and a long stay made at Aleppo; after which Syria and Palestine were twice traversed in their entire length, and an excursion made into the trans-Jordanic region of Bashan. Egypt, reached

by sea from Beyrout, occupied six months in *dahabieh*, producing a remarkable series of drawings of the principal objects of interest between Alexandria and the First Cataract.

Lord Somers was never able to command afterwards sufficient leisure to undertake any of the archaeological excavations which he had so much at heart; but it was principally owing to his inspiration that two important undertakings of the kind came to be realised. The daguerrotype views of the Budrum bas-reliefs led soon afterwards to the obtaining, by Lord Stratford de Redcliffe (then Sir Stratford Canning), of a *firman* for their removal, which was accomplished by Mr. Alison, at that time Secretary of Legation, and ultimately brought about the Halicarnassus expedition, under the conduct of Mr. C. T. Newton. The Cyrene expedition of Lieutenant Spratt was also undertaken at the suggestion of Lord Somers, who had a considerable hand in the previous journey of the Rev. James Hamilton, whose charming book, 'Travels in North Africa,' gives so interesting an account, of that remarkable region. Another project of his, which has not been realised, but which is well deserving of attention, was an exhaustive examination of the tombs of Coricia Caverna, in Cilicia, whereby he expected much funeral epigraphy of the early centuries of Christianity to be recovered. On some of the sites the inscriptions are chiefly Christian, in others principally Pagan. It is doubtful whether there be known any other region wherein those two classes of inscriptions occur side by side in such numbers.

REPORT OF THE EVENING MEETINGS, SESSION 1883-4.

Seventh Meeting, 25th February, 1884.—Sir RUTHERFORD ALCOCK, K.C.B.,
Vice-President, in the Chair.

ELECTIONS.—*William Allan, Esq.; Waller Crick, Esq.; Henry Dann, Esq.; Lawrence Hindson, Esq.; Richard Laishley, Esq., F.R.S. LIT. &c.; Frank Mason, Esq.; Walter Frederick Miéville, Esq. (H.B.M. Consul at Rio Grande do Sul); Dr. Emil Riebeck; P.W. Scott, Esq.; Richard Gillham Thomsett, Esq.; W. Wyke, Esq.*

Papers:—

"Progress of Discovery along the Coasts of New Guinea." By C. R. Markham, Esq., C.B.

Will be published, with a complete Bibliography relating to New Guinea, in "Supplementary Papers," Vol. I. Part 2.

Eighth Meeting, 10th March, 1884.—The Right Hon. Lord ABERDARE,
President, in the Chair.

PRESENTATION.—*Charles W. Thompson, Esq.*

ELECTIONS.—*The Right Hon. Lord Coleridge (Lord Chief Justice of England); Levi Cohen, Esq.; Lieut.-Col. Sir Francis Walter De Winton, B.A., K.C.M.G.; John Gannon, Esq.; Alfred P. Maudslay, Esq.; William Milford, Esq.; Alfred W. Olver, Esq.*

The following papers were read:—

1. "Lupton Bey's Geographical Observations on the Bahr-el-Ghazal Region: with Introductory Remarks by Malcolm Lupton." Read by Mr. Malcolm Lupton, brother of Lupton Bey.

Will be published with a map in the next number of the 'Proceedings.'

2. "The Somāl and Galla Countries." By E. G. Ravenstein.

Will be published in a subsequent number.

Ninth Meeting, 24th March, 1884.—General Sir H. C. RAWLINSON, K.C.B.,
in the Chair.

PRESENTATIONS.—*Captain J. Henderson Smith, R.N.B.* (Commander of the Worcester Training Ship); *Richard Laishley, Esq.*; *J. A. Morris, Esq.*

ELECTIONS.—*W. St. L. Chase, Esq., v.c.*; **Commander A. Duke Crofton, R.N.*; *Juland Danvers, Esq.*; *John A. Gosset, Esq.*; *Captain J. Henderson Smith, R.N.B.*; *William J. Smith, Esq.*; *Wm. Henry Stewart, Esq., Staff-Surgeon R.N.*; *Robert Wright, Esq.*

The following paper was read :—

“Notes on the Physical and Historical Geography of Asia Minor, made during Journeys from 1879 to 1882.” By Colonel Sir CHARLES W. WILSON, R.E., K.C.M.G.
Will be published in a subsequent number of the ‘Proceedings.’

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—February 12th, 1884: Special meeting. **M. FERDINAND DE LESSEPS**, President of the Society, in the Chair.—The meeting was convened for the reception of **M. A. Thouar**, the explorer of the Pilcomayo, who had just returned from South America, where he had been engaged in searching for the remains of the Crevaux Mission. The meeting was held in the large Sorbonne hall. **M. Foncin**, Inspector-general of Second-grade Teaching and the author of several treatises upon geography for the use of schools, represented the Minister of Public Instruction. The Vice-President of the Municipal Council of Paris was also present, as well as a large number of members of the Institute, senators, deputies, &c. **M. de Lesseps**, in opening the meeting, congratulated himself on the active interest shown by the public in these geographical celebrations. After alluding to the meeting in May 1881 when **Dr. Crevaux** was present, and having made some observations on French enterprise generally, **M. de Lesseps** said in conclusion, that **M. Thouar** seemed to be animated with the holy fire of travel. Having gone in the first instance to South America as the representative of a commercial house, it was on being informed of the massacre of **Crevaux**, and especially on hearing the rumour regarding the escape of several members of this mission, that **M. Thouar** conceived the idea of inquiring into the causes of the catastrophe, and going to rescue the survivors, who were stated to be prisoners in the hands of the **Tobas** Indians.—**M. Emile-Arthur Thouar** is yet a young man, being only 31 years of age. He was born in the island of **Rhé**, in July 1853. A photograph, which might be seen in the collection of photographs of travellers made with great care by **M. Jackson**, the energetic librarian and record-keeper of the Society, represents **M. Thouar** in his travelling costume, rifle in hand. The portrait with its dusky complexion indicates a man of energy, and this characteristic is observable at once upon seeing the traveller himself. From a short report drawn up by **M. Thouar**, which accompanies the photograph, we learn that he has already made three journeys in South America. After having traversed **Mexico** and the **Antilles** he visited during the period from September 1879 to January 1884, **Venezuela**, **Colombia**, **Ecuador**, **Peru**, **Bolivia**, **Chili**, **Paraguay**, **Uruguay**, and the **Argentine Republic**. His third journey lasted from 21st May 1883 to 10th November, and was made from **Tacna** in **Peru** to **Asuncion** in **Paraguay**. The traveller, starting from the source of the **Pilcomayo**, descended that river as far as its confluence with the **Paraguay**, and in this way traversed the unexplored region of Northern Gran

Chaco.—M. Thouar then addressed the meeting, and described the progress of Dr. Crevaux day by day until the fatal 27th April 1882, when he and his party were massacred by the Tobas. The causes of this catastrophe were, he said, now well known. Some few days before Dr. Crevaux and his expedition crossed the Bolivian frontier, several horses were stolen from the commander of the garrison of Caiza. It was supposed, but very wrongly, that the culprits were the Tobas, and consequently a party was sent against them. Ten of them were killed and a similar number made prisoners, among whom were several children. Dr. Crevaux entirely disapproved of this little expedition when he heard of it. He felt that this act of gross injustice would cause retaliation on the part of the Tobas, and therefore, before proceeding into their territory, he sent an emissary to them in the person of a woman of their tribe, charging her to tell the Tobas that he himself would bring back their children who had been made prisoners, and restore them to their parents. Every one had a presentiment that Dr. Crevaux was going to meet with a misfortune. The friendly Indians, the Chiriguano, witnessed his departure with tears in their eyes, and said, "Go with God, friend." Crevaux, however, thought that his open and evidently peaceful attitude would remove all mistrust from the Tobas. He was so convinced of this that in the course of a few days he was writing to this effect, "We have made peace with the Tobas." But he was terribly mistaken. The Tobas were animated with but one desire, and that was to wreak their vengeance on the first party of white men they encountered. It was Dr. Crevaux's expedition that first presented itself, and the Tobas massacred them in return for the injustice done to themselves. These Indians, said M. Thouar, were not so treacherous or savage as they were imagined to be, and that if anybody was to blame it was those who maltreated the Indians and drove them to deeds of revenge, which recoiled upon the innocent. M. Thouar spoke in feeling terms when stigmatising the hasty conduct of the Caiza authorities, "As if," said he, "there did not beat in the breast of the Indian a human heart, which ought to be taken into account." In his letters to the Society M. Thouar had already held up to public indignation the wretches without hearts or consciences, who, when beyond the lines of the outposts of civilisation, plunder the Indians of their goods, their cattle, their wives and their children, and sell them for slaves. The first among the party to fall were Dr. Crevaux the head of the expedition, Billet the astronomer, and Ringel the photographer and artist; a French steersman named Haurat, and an Argentine named Blanco, managed to escape. A boy, Ceballos by name, whose father had just been massacred under his son's eyes, was about to suffer the same fate, when a Toba more compassionate than the rest took him under his protection and thus he was saved. M. Thouar interrogated this lad Ceballos, but the boy was so affected by the scene of carnage, at which he was present, that his answers were confused and did not reveal anything satisfactory. With regard to Haurat and Blanco, M. Thouar was thoroughly convinced from information he gathered on the spot that they did really escape, but that, after four or five months' of severe privations and sufferings, they succumbed. Of the remains of the expedition the traveller stated he had only collected a few articles, viz. a sketch by Dr. Crevaux, a barometer, a portion of a letter and a wooden thwart belonging to one of the boats. After the massacre the Indians took possession of the baggage, the arms and ammunition; the boats they set fire to on the spot. The articles collected by M. Thouar were exhibited on the table, together with the instruments, utensils, articles of clothing, and weapons brought from the country of the Tobas. With regard to these Indians, M. Thouar gave some very interesting details respecting their manners and customs; and by the aid of photographs, projected by oxy-hydrogen light, he represented to the audience various types of the natives (both male and female). The Tobas, it

would seem, are tall, strong, and muscular. In their ears and sometimes through their noses they wear strong metal rings, specimens of which the traveller exhibited; they cover their skin with a very elegant tattoo. Excessively lazy, they do not devote themselves to cultivation of any kind, the mere effort of handling an axe giving them blisters on their hands. From this it might easily be imagined that industry with them is not in a very advanced condition. With regard to musical instruments, they can only boast of a stick with a hole bored in it; through this they blow or rather whistle. They are able to light a fire with extraordinary rapidity, by causing a pointed piece of wood to revolve in a cavity in another piece, which they hold between their feet; they lose no more time than we should in taking a lucifer match from a box and striking it. To clothe and protect themselves they make small coats of stuff, stout enough to be proof against arrows. They catch fish in swimming. Woman they regard as a slave, and she does the work. Jealousy is a distinguishing characteristic of the latter, and consequently combats between women are very frequent. They fight with very sharply pointed fish-bones fastened on their wrists; thus armed they rend each other's breasts with great fury, not relaxing until death supervenes. The children are buried alive with the mother! and the women not unfrequently suffocate their offspring. These facts seem to contradict what M. Thouar said previously, viz. that these people were not so ferocious as had been supposed.—The second part of M. Thouar's paper was devoted to an account of his journey on the Pilcomayo and across Northern Gran Chaco. M. Thouar did not add much, if anything, to the details published, undoubtedly under his own direction, in the *Diario* of Buenos Ayres (7th December, 1883), which were reproduced in the Society's publications. The Pilcomayo is navigable for the greater part of its course, but in the lower parts of the river the morasses render navigation difficult. It is probable that the traveller is reserving the scientific results of his exploration for publication in another form; with regard to the commercial results, which are certainly the most important, he made no observations at the meeting.—M. de Lesseps, in conclusion, congratulated the traveller upon his explorations, and informed him that the Society had decided to present him with a gold medal, which would be awarded in the usual course at the distribution of prizes.

— February 15th, 1884: M. BOUQUET DE LA GRYE, President of the Central Commission, in the Chair.—At the commencement of the meeting, the annual report of the librarian and record-keeper, Mr. J. Jackson, upon the state of the library and the collections of the Society during the year 1883 was laid on the table. From the report it appeared that the collection of maps and non-periodical works had increased by 1123 works comprising 1565 volumes, and 206 maps in 1034 sheets, besides 25 atlases. The periodicals numbered 526, being an increase of 114 over the figures of the preceding year. Exchanges were made with 306 Societies, Periodicals, &c. The collection of photographs was composed of 72 series representing views of various countries, and these were arranged in geographical order. That of the portraits of travellers and geographers numbered 1250, as against 600 only in 1882. The loans, which were 474 during the year 1882, had reached a total of 776 in 1883.—The Committee appointed for organising the seventh Congress of the French Geographical Societies, which is to be held this year at Toulouse, sent a communication stating that the date of this conference had just been fixed by the Geographical Society of that town for the 2nd to the 8th or 9th of August, subject to the approval of the other societies. There would be an exhibition and several excursions to the Pyrenees.—It was then announced that news had at last been received from M. Giraud, naval lieutenant, who started some time ago for an exploration in East Central Africa, and a letter dated 22nd December, 1883, was read from M. Ledoux, French Consul at Zanzibar. The letter stated that a man, who ha

left M. Giraud's caravan on the 12th of July, at a place four days' march from Lake Moero, had been interrogated by the Consul, and also that another porter was expected shortly to arrive with despatches for the Consul. From the very confused information given by the native, it was ascertained that M. Giraud, whilst penetrating into the interior of the country, had encountered a party of Maviti, to whom he had been obliged to pay a considerable tribute, in order to obtain the right of way; that the Sultan of Urori had, by procuring him porters, assisted him to cross the mountains of Mérére; the highest peaks of which range attained an elevation of 27,890 feet (8500 metres).* The young traveller had made a stay of a fortnight on the Bangweolo before crossing the Untari. He had then reached the Chambesi, which he had crossed, and was directing his course to the north-west. The Consul supposed that M. Giraud's object was to take the Congo almost from its source, and to descend the river. By this time he should have made considerable progress down this river, and it would soon be possible for him to send news to Europe via the West Coast.—With regard to M. Georges Revoil, news received from Mogadoxo informed the Consul that he had returned to the coast because he found it impossible to proceed from Guelidi to Gananeh, owing to the hostility of the tribes through whose territory he had to pass. It was not, it appears, from mere fanaticism and hatred of the foreigner alone that the native chiefs refused him a passage; they saw in him a competitor in commerce who would be able to totally deprive them of, or at least considerably diminish, the profits they realised by transporting to the coast the products of which they possess the monopoly.—M. Romanet du Caillaud presented a communication entitled "Des droits territoriaux de la France sur certains points de la côte d'Ethiopie." This was a reply to certain objections, raised by M. de Lesseps at a former meeting (18th January, 1884) against another pamphlet by M. R. du Caillaud upon the territorial rights of France in the basin of the Red Sea. It should have been stated in the report of that meeting, that M. de Lesseps, not content with making observations on M. du Caillaud's paper, spoke at considerable length on Abyssinia, and its efforts to obtain a port on the Red Sea, a desire which had been expressed to the French Government, and on the chances there were that she would obtain her request. The reading of M. du Caillaud's new paper was reserved for a future meeting; in the interim it will be communicated to M. de Lesseps, in order that he may be able to make his observations thereon. The facts brought forward by M. du Caillaud to induce France to reassert the claims she has on certain points, viz. Edd, Adulis, Ouda, Dessi, &c., in the basin of the Red Sea, brought M. Carrey, engineer of bridges &c., to the platform. He pointed out another spot, viz. the bay of Sheik-Said on the Straits of Bab-el-Mandeb, on the coast of Arabia. A Marseilles company acquired there, from the Sheik Ali-Tabatt, a tract of country of over 400,000 acres (165,000 hectares) in extent, which was entirely independent of Turkey. In 1870 M. Carrey stated he made an exploration of this bay in the interests of the company of which he spoke, viz. the Rabaud-Bazan Company.—M. Ch. Gauthiot, General Secretary of the Society of Commercial Geography, communicated a letter received from Para, and dated 27th December, 1883. The letter was concerned with an expedition which started from French Guiana, with the view of ascending the river Amazons. The principal objects of the expedition were to study the speed and direction of the currents, to make soundings, and to explore particularly the left bank, together with some affluents on this side of the river. The explorers were MM. Coudreau, Roche, and Demont.—In conclusion, M. Castounet-Desfosses read a paper on the part played

* So stated in the report of our Paris Correspondent.—ED.

by Bussy, the lieutenant of Dupleix, in India, in the eighteenth century. He stated that Dupleix had his attention turned towards Indo-China and Tong-king, and he (M. Castounet-Desfosses) hoped that in another half-century it would be possible to speak of Asiatic France, as to-day African France was spoken of.—The series of scientific lectures organised by the Society were stated to have commenced, and the Chairman, as the meeting was rising, announced that a generous donor, M. Pierre de Balachoff, had just sent 1000 francs towards the expenses of these lectures.

— March 7th, 1884: M. BOUQUET DE LA GRÈVE, President of the Central Commission, in the Chair.—M. William Hüber, General Secretary of the Commission of Awards, announced the names of the medallists of the Society for the year 1884 as follows:—The first gold medal had been awarded to the expedition commissioned to make soundings and dredgings in the Atlantic, which was directed by M. Alph. Milne-Edwards, of the Institute, professor at the Jardin des Plantes; the Government vessels *Travailleur* and *Talisman* having been used for the purposes of the expedition. (The curiosities and specimens collected by this expedition had been exhibited since the 1st of February in the galleries of the Natural History Museum at the Jardin des Plantes, and the exhibition had been very popular.) A gold medal had been awarded to M. Arthur Thouar for his journey in South America in search of the remains of Dr. Crevaux; another medal to M. Désiré Charnay in consideration of his archæological researches in Yucatan.—M. Denis de Rivoyre, who for more than fifteen years is said to have been working to bring about an official and definite installation of France in Obock, informed the Society that his efforts had just been crowned with success. From the 19th of December last, the Minister of the Navy and Colonies had signed with the “Compagnie Française des steamers de l’Ouest,” plying between France and the Persian Gulf, a contract for the installation at Obock of a coal and provision dépôt, where the French Navy, hitherto supplied from Aden, might in future re-victual. This taking possession, which may be considered as final, perpetuates the work of Vice-Admiral Fleuriot de l’Angle. M. Rivoyre congratulates himself upon this, as he thinks that henceforth French vessels *en route* for Madagascar and Cochin China will be able to cast anchor under the shadow of the national flag, and that travellers will find there the protection and shelter necessary for their operations.—A communication was received from General M. Venukoff announcing the complete publication of the general map of Russia, scale 1 : 4,200,000, the original manuscript of which was exhibited in 1875 at the Geographical Exhibition of the Tuileries at Paris. This map, which commenced to appear in parts some six months ago, could now be purchased complete for a moderate sum (ten francs for eight large sheets). The map, besides giving the whole of the Russian possessions in Asia beyond the Caspian Sea, represents a part of the Chinese Empire, a portion of India and Persia, the whole of Afghanistan and Beluchistan, and nearly the whole of Russia in Europe. M. Venukoff announced further the publication of a Russian work upon Merv, the author of which was M. Alikhanoff, an officer in the army. This work was printed by order of the Russian Staff, and would not be on sale. Our correspondent stated also that M. Lessar was engaged in the Transcaspien districts in reconstructing and improving the wells which are situated along the road from Askabad to Merv.—The Director of the Anthropological Museum at Buenos Ayres, Dr. Moreno, who started some thirteen months ago on an official mission from his Government, wrote (the date of his letter was not given) from San Juan that he intended to set out for the Andes in a few days. His journey is to last for five years. He will visit the northern part of the Argentine Republic, Bolivia, and Peru as far as Cuzco, and it is probable that in order to return to Buenos Ayres he will descend the River Amazons.—A letter, dated November 30th, 1883, was received from M. Charles Hüber, who is charged by the Minister

of Public Instruction with a mission to Arabla. The communication was written from Haïl, where he arrived on October 27th, having been very cordially received by the Emir Ebn-Réshid. He had already made two short excursions, one to Jebel-Agâ and the other to Jebel-Gildiâh, whence he had brought back more than a hundred inscriptions, besides obtaining much geographical information. He was going to start upon a journey making a complete circle round Jebel-Agâ, hoping by this means to determine once for all the direction of this chain of mountains. On his return from this exploration he intended to proceed to Hedjaz, which he hoped to explore thoroughly.—M. H. Duveyrier then gave a *résumé* of the journey of M. Georges Revoil in the Somali country. He stated that the traveller had, as was already known, failed in his undertaking, having been baffled by the duplicity of the chiefs of the district, and by the plundering propensities of the Somali tribes, their natural instincts in this direction being still more excited by the outburst of fanaticism of which the east of Africa was at the present moment the scene. M. Revoil was not able to proceed from Guelidi to Gananeh, in consequence of the ambushes and traps prepared along his route by Omar Yotsef, a worthy successor of the King Ahmed Yotsef, who assassinated (by poison) the traveller Kinzelbach. If the French traveller had not discontinued his journey in time, he would never have retraced his steps to Mogadoxo, but would have met with the same fate as Kinzelbach, Sacconi, Baron Von der Decken, and others. The vast extent of territory occupied by the Somali people is now, it appears, and has for a long time been closed to all European travellers who are suspected of not being sincere Mahommedans. M. Revoil was going to return to Zanzibar, in order to make preparations for another journey into the interior.—With regard to the traveller Sacconi, whose name was mentioned above, M. Ant. d'Abbadie, of the Institute, communicated a letter from Mgr. Taurin-Cahagne, in which the latter gave the details he had been able to collect concerning the Italian traveller, whose fate was so unfortunate. M. Sacconi, it seems, had not gone more than five or six days' march from Harar, and when he met with his sad death he was only a short distance from the frontier of the Anniyas (Oromo), whose territory skirts for a few miles the northern border of the country of Ogadine.—General M. Venukoff announced that the representatives of the various Russian administrations who were engaged in geodesical and hydrographical works, had met in conference, in order to devise a plan for the scientific concentration of all operations of this character. The object of the Conference which had just assembled was to put an end to the chaos now existing in this branch of administration, and to establish some order and plan in the general methods of Russian geodesical works. Among the members of this council the following names appeared:—MM. Otto Struve, General Tillo, Putschine, Fadéief, &c. The Geographical Society of St. Petersburg was represented by several of its members. It was stated that every year the Russian Government spends not less than 160,000*l.* sterling (4,000,000 francs) on geodesical works throughout the empire.—The President of the French Topographical Society wrote, stating that this Society proposed to submit to the next Congress of the French Geographical Societies a scheme for the organisation of a National School of Geography. This would be thus taking up the work of the first French Republic (for a School of Geography existed then), and with all the advantages and development of which the present age admits. The General Secretary of the same Society, M. L. Drapeyron, editor of the '*Revue de Géographie*,' gave some details with regard to the topographical excursions organised in a large number of towns throughout the country by the military authorities, and carried out under the auspices of the Society. M. Drapeyron took the opportunity, while on the platform, of announcing the formation of a Geographical Society at Tours, which would, he said, devote itself to the study of the geography of the centre of

France.—In conclusion, a communication was made by M. Constant Germain Bapst regarding the mission which he had recently accomplished in Daghestan.* Before, however, pronouncing the meeting at an end, the Chairman stated that M. Ferdinand de Lesseps, President of the Society, had just been elected a member of the French Academy, he being already a member of another section of the Institute, viz. the Academy of Sciences.—M. B. de la Grye proposed that the meeting should offer its congratulations to the newly-elected member, and a motion to that effect was carried unanimously.

NEW BOOKS.

(By E. C. RYE, *Librarian R.G.S.*)

EUROPE.

Drosinis, Georgios.—Land und Leute in Nord-Eubœa. Ländliche Briefe von Georgios Drosinia. Deutsche autorisirte Uebersetzung von Aug. Boltz. Leipzig (Friedrich): 1884, 12mo., pp. xii., 180. (*Dulau*: price 3s.)

These letters contain very slight references to physical conditions in the Northern Eubœa, being chiefly of historical and poetical tendencies.

La France par rapport à l'Allemagne. Étude de Géographie Militaire. Bruxelles (Merzbach & Falk): 1884, 8vo., pp. xii., 375. (*Dulau*: price 6s.)

Entirely consists of topography from the strategical point of view; the sheets ii., iii., v., and vi. of the French map published by the Dépôt des Fortifications, are recommended to be used in illustration.

Roissard de Bellet [Le Baron].—La Sarcaigne à vol d'oiseau en 1882. Son Histoire, ses Mœurs, sa Géologie, ses richesses métallifères, et ses productions de toute sorte. Paris (Plon): 1884, large 8vo., pp. 339, map, illustrations. (*Hachette*: price 10s.)

An excellent review of the mineral resources and actual and possible mining operations in Sardinia, supplemented by descriptions of its history, geography, inhabitants and their industries, &c. The map (scale 1:375,000) is devoted to the mining interests, but shows roads, villages, &c., on a somewhat large scale.

ASIA.

Schlumberger, Gustave.—Les Iles des Princes. Le Palais et l'Église des Blachernes, la grande muraille de Byzance. Souvenirs d'Orient. Paris (Lévy): 1884, 12mo., pp. 425. (*Dulau*: price 3s.)

The account of the Princes Islands, of which Prinkipo is the chief, situated near Constantinople, off the Bithynian coast, is almost entirely historical. Slight topographical details are given in the other notes, the latter of which describes excursions to Sardes and Philadelphia.

Marvin, Charles.—The Russians at Merv and Herat, and their power of invading India. London (W. K. Allen & Co.): 1883, 8vo., pp. xvi., 470 [no index], maps and illustrations. Price 24s.

Apart from political matter, this volume contains an account of Lessar's journey from Askabad to Sarakhs, and from the latter place to the outposts of Herat; also of the visit of Alikhanoff and Sokoloff to Merv on a secret Russian mission. Some of the illustrations are by Alikhanoff, and others by Karazin, who accompanied the exploring expedition of 1878. The maps are of the Tejend Oasis and roads to Merv, a sketch map of the country between the Hari Rud and Murghab, and General Annenkoff's map of the projected Russo-Indian Railway to join the European and Indian railway systems.

* See quarterly *Bulletin*.

AFRICA.

Johnston, H. H.—The River Congo, from its mouth to Bólóbó; with a general description of the Natural History and Anthropology of its western basin. London (Sampson Low, Marston, Searle, and Rivington): 1884, 8vo., pp. xvii. and 470, maps and illustrations. Price 21s.

This work supplies the details (especially as regards fauna, flora, and anthropology) of the journey up the Congo already reported in our 'Proceedings' for 1883, pp. 569 and 692. The climate, natural history, people, and languages of the Western Congo are separately discussed at considerable length; and the whole subject is profusely illustrated by reproductions of drawings of scenery, plants, animals, natives, &c., made on the spot by the author, and in nearly every case of remarkable excellence, and evident fidelity. The maps are reproduced from our 'Proceedings.'

AMERICA.

Saint-André, A. Dupin de.—Le Mexique aujourd'hui. Impressions et Souvenirs de Voyage. Paris (Plon): 1884, pp. iv. and 284. (*Dulau*: price 3s.)

Chiefly refers to conditions in the capital.

ARCTIC.

McCormick [Deputy Inspector-General], R.—Voyages of Discovery in the Arctic and Antarctic Seas, and Round the World: being personal narratives of attempts to reach the North and South Poles; and of an open-boat Expedition up the Wellington Channel in Search of Sir John Franklin and Her Majesty's ships *Erebus* and *Terror*, in Her Majesty's boat *Forlorn Hope*, under the command of the author. To which are added an Autobiography, Appendix, &c. London: (Sampson Low & Co.), 1884, 2 vols. 8vo., pp. xx. and 432, xii. and 412, maps and illustrations. Price 2l. 12s. 6d.

Although the great voyages referred to in the above title, and in which the author took so active a part, have long become matter of history, these two lengthy volumes, entirely composed of details, profusely and excellently illustrated from Mr. McCormick's drawings, and abounding with maps, cannot fail to find a useful place in every collection of Arctic books. The author's narrative is given in diary form, rendering analysis almost impossible; its value consists in the multiplicity of minute topographical and scientific observations, and in its extraordinary fund of accurate delineations of Arctic phenomena and events.

GENERAL.

Boguslawski [Prof. Dr. Georg. von].—Handbuch der Ozeanographie. Band I. Räumliche, physikalische und chemische Beschaffenheit der Ozeane. Stuttgart (Engelhorn): 1884, cr. 8vo., pp. xviii. and 400. (*Dulau*: price 7s. 6d.)

Forms part of the series entitled 'Bibliothek geographischer Handbücher,' edited by Dr. Ratzel, of which that author's 'Anthropo-Geographie' and Dr. Hann's 'Klimatologie' have already appeared. Oceanography is recognised as one of four components of physical geography (the other three being geology, surface geography, and knowledge of atmosphere), and is discussed under six headings: 1, the division and systematic arrangement of the separate oceanic spaces (Atlantic, Pacific, Indian, Arctic and Antarctic Oceans); 2, the relief of sea-basins from surface to bottom; 3, oceanic chemistry; 4, specific gravity or density of sea-water; 5, colour, luminosity, and transparency; 6, maritime meteorology, vertical temperature divisions, and ice. In the appendix, a list is given of the chief voyages since the middle of the 18th century, which have contributed to a knowledge of oceanic physics.

NEW MAPS.

(By J. COLES, *Map Curator* R.G.S.)

EUROPE.

France.—Carte des rivières navigables et des canaux exécutés, en construction et projetés. Scale 1:390,000 or 19 geographical miles to an inch. Paris, Andriveau-Goujon. (*Dulau.*)

Italia, I', par L. Wuhrer. Scale 1:1,600,000 or 21·9 geographical miles to an inch. Paris, Andriveau-Goujon. 2 sheets. (*Dulau.*)

Oesterreichisch-Ungarischen Monarchie, Spezialkarte der——. Scale 1:75,000 or 1 geographical mile to an inch. K. k. militär-geografisches Institut, Wien, 1884. Sheets:—Zone 19, Col. XVI. Kis-Komárom und Zala-Szt-Mihály. Zone 19, Col. XVII. Somogyvár. Zone 19, Col. XX. Paks und Kalocsa. Zone 20, Col. XVI. G. Kanizsa und Zákány. Zone 20, Col. XVII. Kaposvár und Böhönye. Zone 20, Col. XVIII. Ó-Dombóvár. Zone 21, Col. XVIII. Fünfkirchen. Zone 22, Col. XVIII. Harkány und Dolnji-Miholjac. Zone 22, Col. XIX. Mohács und Villány. Zone 22, Col. XXII. Zenta und Ada. Zone 22, Col. XXIV. Temešvár und Sándorháza. Zone 23, Col. XXII. Török-(Uj-)Becse. Zone 25, Col. XIV. Žirovac und Vranograč. Zone 25, Col. XV. Kostajnica und Novi. Zone 25, Col. XXIV. Werschetz und Alibunar. Zone 26, Col. XIV. Biháč und Krupa. Zone 26, Col. XXIII. Semlin und Pancsova. Zone 27, Col. XII. Carlopago und Jablanac. Zone 27, Col. XIII. Gospič und Korenica. Zone 27, Col. XIV. Dolnji Lapac und Vakuf-Kulen. Zone 27, Col. XXIII. Brestovác. Zone 28, Col. XIII. Medak und Sv. Roch. Price 1s. 4d. each sheet. (*Dulau.*)

—— Die Oesterreich.-Ungarischen Eisenbahnen der Gegenwart und Zukunft. Karte zur Reise, so wie zur Uebersicht der befahrenen, im Bau befindlichen, concessionirten und projectirten Eisenbahnen, nebst deren eigenthümlichen Benennungen. Scale 1:1,810,400 or 24·8 geographical miles to an inch. Erneute Ausgabe mit 3 Beikarten: Das nordböhmische Eisenbahnnetz.—Umgebung Wiens.—Die Orient-Anschlüsse. Artaria & Co., Wien, 1884. Price 1s. 6d. (*Dulau.*)

ORDNANCE SURVEY MAPS.

Publications issued from 1st to 31st December, 1883.

6-inch—County Maps:—

ENGLAND AND WALES: **Berkshire** (part of): Sheet 12 with Sheet 11 (Wiltshire); 2s. 6d. **Buckinghamshire** (part of): Sheet 40 with Sheet 47 (Oxfordshire); 2s. 6d. **Glamorganshire** (part of): Sheet 30; 2s. **Gloucestershire** (part of): Quarter sheets, 10 N.E. with 53 N.E. (Worcestershire); 31 S.E.; 49 S.W.; 50 N.W.; 1s. each. **Hertfordshire** (part of): Sheets 8, 14; 2s. 6d. each. **Northamptonshire** (part of): Quarter sheets, 59 N.E., 59 S.W.; 60 N.W., 60 N.E.; 61 N.W., 61 N.E., 61 S.W.; 63 N.W.; 1s. each.

25-inch—Parish Maps:—

ENGLAND: **Bedford**: Dunton, 6 sheets; Oakley, 5; Stevington, 8; Wrestlingworth, Area Book. **Cornwall**: St. Breward, Ar. Bk. **Derby**: Hartshorn, Ar. Bk.; Newton Solney, Ar. Bk.; Repton, Ar. Bk. **Gloucester**: Horfield, 6 and Ar. Bk.; Kingscote, 8; Quenington, 6; Sherborne, 10; Tibberton, 7. **Leicester**: Blackfordby, 5; Normanton le Heath, 5; Osgathorpe, Ar. Bk.; Staunton Harold, 6; Swannington, 4 and Ar. Bk.; Thringstone, 5 and Ar. Bk.; Worthington, 7. **Leicester and Derby** (Det.): Ravenstone, 8.

Monmouth: Bassaleg, 16 and Ar. Bk.; Bettws, Ar. Bk.; Bishton, Ar. Bk.; Coedcernew, Ar. Bk.; Goldcliff, 9; Grosmont, Ar. Bk.; Llantilio Crossenny, Ar. Bk.; Llanwern, Ar. Bk.; Magor, Ar. Bk.; Marshfield, Ar. Bk.; Michaelston Fedwy, Ar. Bk.; Peterstone Wentloog, 7 and Ar. Bk.; Rumney, Ar. Bk.; St. Brides Wentloog, 6 and Ar. Bk.; St. Mellons, Ar. Bk.; Whitson, Ar. Bk.

Norfolk: Attleborough, 12 and Ar. Bk.; Breckles, 6 and Ar. Bk.; Caston, 4 and Ar. Bk.; East Tuddenham, Ar. Bk.; Elsing, 6 and Ar. Bk.; Hargham, Ar. Bk.; Hockering, 8; Lyng, 8; Mattishall, 7; Mattishall Burgh, Ar. Bk.; North Tuddenham, 6 and Ar. Bk.; Rockland All Saints, 7 and Ar. Bk.; Rockland St. Andrew, 6 and Ar. Bk.; Rockland St. Peter, 6 and Ar. Bk.; Stow Bedon, 8 and Ar. Bk.; Wilby, Ar. Bk.

Nottingham: Wollaton, 6.

Shropshire: Broseley, Ar. Bk.; Buildwas, Ar. Bk.; Chirbury, Ar. Bk.; Church Preen, Ar. Bk.; Claverley, 15; Dawley Magna, Ar. Bk.; Hughley, Ar. Bk.; Flyssington, 2 and Ar. Bk.; Liuley, Ar. Bk.; Little Wenlock, Ar. Bk.; Much Wenlock, 18; Ratlinghope, Ar. Bk.; Ruckley and Langley, Ar. Bk.; Shelve, Ar. Bk.; Stirchley, Ar. Bk.; Stockton, Ar. Bk.; Sutton Maddock, Ar. Bk.; Woolstaston, Ar. Bk.; Worthen, Ar. Bk.

Suffolk: Barnham, Ar. Bk.; Benhall, Ar. Bk.; Coney Weston, Ar. Bk.; Little Glemham, Ar. Bk.; Marlesford, Ar. Bk.; Rendlesham, Ar. Bk.; Sapiston, Ar. Bk.; Stratford St. Andrew, Ar. Bk.; Wantisden, Ar. Bk.

ASIA.

Buchara und Afghanistan (Pamir und Quellen des Oxus), Das Grenzgebiet von—. Uebersicht der Russischen Forschungs-Expeditionen von A. Regel, Iwanow, Putjata und Benderski 1882 und 1883, sowie dem Punditen vom Indischen Vermessungscorps Münschi-Abdul-Subhan, 1878-1881. Nach provisorischen Materialien u. älteren Quellen entworfen u. gez. v. B. Hassenstein. Scale 1 : 1,700,000 or 23·3 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Tafel 4. Justus Perthes, Gotha. (*Dulau.*)

Sumatra.—Overzichtsk kaart von Groot-Atjeh. Scale 1 : 50,000 or 1·4 inches to a geographical mile. Topographisch bureau, Batavia. (Uitgave Juli 1883.) 4 sheets. Price 8s. (*Dulau.*)

This map extends in latitude from 5° 20' N. to 5° 40' N., and in longitude from 95° 12' E. to 95° 43' E. It contains a detailed survey of the greater portion of the included district, exhibiting land under cultivation, proposed railways, and contours for every 25 metres of difference in height. A large amount of statistical information is also given, and two inset maps, one of Groot-Atjeh, another of Poeloe Bras.

AFRICA.

Amábara-Fluss, Der.—Aufgenommen 28-31 Juli 1883. Von Ed. Robert Flegel. Scale 1 : 700,000 or 9·5 geographical miles to an inch. Mittheil. d. Afrikan. Ges. in Deutschland. Bd. IV. Taf. 6. D. Reimer, Berlin, 1884. (*Dulau.*)

Central Africa.—Route der Pogge-Wissmann'schen Expedition von Malanshe bis zum Tanganika-See. Juni 1881-August 1882. Aufgenommen von Lieutenant Wissmann. Construiert und herausgegeben von Richard Kiepert. Scale 1 : 750,000 or 10·3 geographical miles to an inch. Blatt I. : Von Malanshe bis Kamba Poko. Blatt II. : Von Kamba Poko bis Mutschimang. Mittheil. der Afrikanischen Gesellschaft in Deutschland. Bd. IV. Taf. 4 und 5. D. Reimer, Berlin, 1884. (*Dulau.*)

On Sheet I. of this map are laid down the routes of Schütt, Capello and Ivens, with the work done by those explorers, in addition to that of Pogge and Wissmann, which it is specially intended to illustrate. It only requires an inspection of this map to form an idea of the large amount of topographical work which it is possible for an experienced and efficient surveyor to perform

during an exploration. In this sheet (and the remark also applies to sheet II.) the physical features for an average distance of 8 geographical miles on either side of the route are given, many elevations of mountains determined, the positions of many places fixed both in latitude and longitude, and the error of the compass ascertained; there are but few route surveys, taken under similar circumstances, which contain such an amount of topographical work.

The first sheet exhibits the route and country from Malanshe to Kamba Poko, and the second sheet from Kamba Poko to Mutschimang. Schütt's route and work are also shown on this sheet.

Mangbattu und Niamniam, Provisorische Karte von Dr. Wilhelm Junkers Reisen im Gebeite der— 1880-82. Reduction einer Originalskizze des Reisenden in 1:420,000 auf den Maasstab 1:1,000,000 or 13·6 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Tafel 5. Justus Perthes, Gotha. (*Dulau*.)

Willänder, Übersichtskarte der— Scale 1:5,000,000 or 66·6 geographical miles to an inch. Mit Carton: Das Nil-Delta. Scale 1:1,500,000 or 20·4 geographical miles to an inch. Von Heinrich Kiepert. Separat-Ausgabe aus dem Hand-Atlas über alle Teile der Erde. No. 34. Berlin, Dietrich Reimer, 1884. Price 1s. 3d. (*Dulau*.)

South Africa.—Original Map of—, containing all South African Colonies and Native Territories. Compiled from all available information, combined with the results of his own explorations, by the Rev. A. Merensky, formerly Superintendent of the Berlin Missions in Transvaal. 1884. Berlin: Simon Schropp'sche Hof-Landkartenhandlung (J. H. Neumann). Scale 1:2,500,000 or 34·4 geographical miles to an inch. 4 sheets. Price 16s. (*Stanford*.)

This map contains all that portion of Africa between the 15th parallel of south latitude and Cape Agulhas; there are numerous corrections and additions, and being drawn on a larger scale than most of the maps of South Africa, it is likely to prove very useful to travellers, the author, the Rev. A. Merensky, being well qualified, by his lengthened residence in South Africa, to undertake the compilation of a map in which judgment would have to be exercised as to the choice of the materials used in its production.

Comparing Merensky's map with one of nearly the same region by Mr. Anderson, lately published in the R.G.S. 'Proceedings' for January 1884, the following discrepancies appear: A marked difference exists in the conformation of the Tshuantya Lake and surrounding country; the Matoppo Mountains (Anderson's Molopo) bear but a very slight resemblance to one another in these two maps; while in the Kalahari Desert, Anderson's contains much the greater amount of detail.

There is the usual difference in the course of the Lower Zambesi, but this appears to be common to all maps, as seen in the results of the surveys taken by the officers of the Portuguese Navy and Engineers.

Taken as a whole, the map contains more information with regard to South Africa than any yet published; its scale is convenient, it shows all the means of communication in the Cape Colony, brought up to the present time, the positions of native kraals in the interior, and the elevations of the mountains; it is well lettered and beautifully drawn.

Tabora, dem Tanganika- und dem Rikwa-See.—Aufnahmen Deutscher Reisender, besonders des Dr. E. Kaiser, in dem Gebiete zwischen— Scale 1:750,000, or 10·3 geographical miles to an inch. Construit und gezeichnet von Richard Kiepert. Mitth. der Afrikanischen Gesellschaft in Deutschland. Bd. IV. Taf. 3. D. Reimer, Berlin, 1884. (*Dulau*.)

INDIAN OCEAN.

Réunion, Ile de la.—Carte de l'— Scale 1:300,000 or 4·1 geographical miles to an inch. Paris, Chaix. (*Dulau*.)

No. IV.—APRIL 1884.]

CHARTS.

Admiralty.—Charts and Plans published by the Hydrographic Department, Admiralty, in November and December 1883, and January and February 1884.

No.		Inches.		
620	m	= 0·9	North America, east coast :—Penobscot bays.	Price 2s.
1772	m	= 3·25	Ireland, east coast :—Approaches to Wexford harbour.	Price 2s. 6d.
97	m	= various	South Pacific ocean :—Anchorages in the Solomon islands.	Price 1s. 6d.
2208	m	= 0·9	Black sea :—Dniester estuary.	Price 1s. 6d.
536	m	= 0·19	Sado island and adjacent coast of Nipon (plans, Sakata harbour, Ogi bay, Niegata roadstead, Kamo harbour).	Price 1s. 6d.
1468	m	= 0·9	Ireland, east coast :—Wicklow to Skerries islands, with Dublin bay.	Price 2s. 6d.
44	m	= 0·9	Ireland, east coast :—Skerries islands to lough Carlingford, with Dundalk bay.	Price 2s. 6d.
979	m	= various	Central Pacific ocean :—Islands between 150° and 170° west longitude. Keirson, Palmyra, Christmas, Enderbury, Malden, Vostok, Flint, Caroline, Humphrey, Penrhyn, Starbuck.	Price 1s. 6d.
946	m	= 3·0	Borneo, north coast :—Kudat harbour.	Price 1s.
283	m	= 0·28	Newfoundland, west coast :—Codroy road to Cow Head harbour.	Price 2s. 6d.
344	m	= 11·0	Spain, east coast :—Port of Tarragona.	Price 1s. 6d.
492	m	= 2·0	India, west coast :—Agoada to St. George islands, including Marmugao and Goa roadstead.	Price 1s. 6d.
855	m	= 0·28	Sumatra, west coast :—Panjak islands and adjacent coast of Sumatra. Tapanuli bay and Pulo Mansalar.	Price 1s.
2427	m	= 2·9	United States, east coast :—Salem harbour, Marblehead, and Beverley harbours.	Price 1s. 6d.
1640	Plans added, Port Tai-oa. Vaieo or Akaoto bay. Perigot bay. Hakaha Tau.			
1676	Plan added, Patras roads.			
1874	Plan added, Port Howard.			

(*J. D. Potter, agent.*)

CHARTS CANCELLED.

No.		Cancelled by	No.
1772	Wexford harbour	{ New plan, Approaches to Wexford harbour	1772
97	Anchorages in the Solomon islands	{ New plans, Anchorages in the Solomon islands	97
2208	Dniester bay to Ovideo lake ..	{ New plan, Dniester estuary ..	2208
536	Sado island and approaches to Niegata	{ New chart, Sado island and adjacent coast of Nipon	536
1467	Wicklow to Dublin	{ New chart, Wicklow to Skerries islands	1468
1468	Dublin to Carlingford	{ islands	
2834	Howth to Drogheda	{ New chart, Skerries islands to lough Carlingford	44
44	Drogheda to Carlingford	{ lough Carlingford	
979	Islands between 157° and 163° west longitude	{ New plan, Islands between 150° and 170° west longitude ..	979

No.		Cancelled by	No.
946	Malludu bay	New plan, Kudat harbour	946
344	Tarragona mole	New plan, Port of Tarragona ..	344
855	Tappanooly harbour	New plans, Panjak islands and adjacent coast of Sumatra, Tapanuli bay, and Pulo Mansalar	855
856	Manissailar harbour		
858	Batoo island		
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CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No. 905. Fiji islands:—Suva harbour to Levuka. 1809. Africa, east coast:—Mozambique to Pomba bay. 1381. Africa, north coast:—Benzert road and lakes. 2347. Japan:—Nipon, Kiusiu, and Sikok island. 280. Newfoundland:—Notre Dame bay. 2010. England, west coast:—Morecambe bay. 1258. Korea:—Approaches to Séoul. 1975. England, east coast:—Kentish Knock and the Naze to West Swim. 1610. England, east coast:—North Foreland to Orfordness. 2121. New Guinea, south coast:—Freshwater bay to Round head. 2122. New Guinea, south coast:—Round head to Orangerie bay. 780. Pacific ocean:—South-west sheet. 2307. Norway, west coast:—Smöelen island to Svee fiord. 2300. Baltic sea:—Stiernö point to Umea light. 2056. Eastern archipelago:—Sunda strait. 767. South Pacific ocean:—Paumotu or Low Archipelago. 2123. New Guinea:—Orangerie bay to Bramble haven. 2247. Baltic sea:—Hogland to Seskär. 650. Africa, east coast:—Kilimani or Quilimane river. 123. Africa, south coast:—Table bay breakwater and docks. 941a. Eastern Archipelago, western portion. 2062. China:—Tong-King gulf. 1380. South Pacific ocean:—New Caledonia, New Hebrides, and Loyalty islands. 764. South Pacific ocean:—New Hanover, New Ireland, and New Britain. 156. Baltic sea:—Mäseskär to Hällö. 2205. Black sea:—Kertch strait. 1466. China:—Hong Kong. 1342. China:—Phan-rang bay to Tong-King gulf. 358. Japan:—The western coasts of Kiusiu and Nipon. 1808. South America, east coast:—Santa Cruz, port and river. 1083. Tasmania:—Burnett harbour and port Arthur. 769. South Pacific Ocean:—Admiralty and Hermit islands. 1543. England, east coast:—Yarmouth and Lowestoft roads. 2111. Borneo, west coast:—Nosong point to Ambong bay. 2056. Eastern archipelago:—Sunda strait. 1602. China:—Entrance to the Yang-tse-Kiang. 1114. South Pacific ocean:—Auckland and Campbell islands. 209. South Pacific ocean:—Ports and roadsteads in Solomon islands. 732. Pacific ocean:—Gilbert islands. 731. Pacific ocean:—Gilbert islands. 766. South Pacific ocean:—Ellice islands, south-eastern group. 980. North Pacific ocean:—Caroline islands. 2049. Ireland, south coast:—Brattin head to Wexford. 2691. South Pacific ocean:—Fiji islands. 1446. Scotland, east coast:—Aberdeen harbour. 548. South America, east coast:—Maldonado bay. 941a. Eastern archipelago, Western portion. 122. North sea:—Mouths of the Maas. (*J. D. Potter, agent.*)

North Atlantic Ocean, Pilot Chart of the—. No. 1. December 1883. Equatorial scale 3·7 degrees to an inch. Prepared by order of the Bureau of Navigation, Commander J. R. Bartlett, U.S.N., Hydrographer. U.S. Hydrographic Office, Bureau of Navigation, Navy Department, Washington D.C. With a pamphlet.

This chart, which is dated December 1883, is the first issue of the weekly series of pilot charts of the North Atlantic to be published by the United States Hydrographic Office, and the United States Hydrographer, in an accompanying

pamphlet, gives a detailed explanation of the method of their compilation as well as their general aim. He points out that with the increase of commerce and the large number of fast steamers crossing the ocean, and the facilities afforded by the submarine cables, a vast amount of valuable information can be collected and published weekly, instead of allowing this information to lie idle for months, or even for years, as has frequently been the case hitherto. A weekly edition of the North Atlantic Pilot Chart would show the track of recent storms and the probable weather at sea for the coming week; it would also show in a graphic form the probable limits of the Gulf Stream, drift ice, bergs, the best track for steamers, reported rocks, shoals, and marine dangers, the establishment of new lights, and the position of buoys.

In order to collect the necessary information to carry out this work, the U.S. Hydrographer makes an earnest appeal for the co-operation of seafaring men and those who are interested in the weather of the ocean. Masters of vessels making extended voyages are asked to keep a log-book prepared by the United States Hydrographic Office, and those who keep these records will be supplied gratuitously with sailing charts for their voyage. Both the log-books and charts can be obtained by application to the Navy Department, Washington, or to the branch offices lately established in Boston, New York, and Philadelphia. The winds and currents shown on the chart have been plotted from Maury's wind and current charts, and from the log-books of ships of war and merchant marine since 1861, covering many thousands of voyages across the Atlantic, and it is proposed, if found necessary, to issue an explanatory pamphlet with each chart. On the present issue are engraved, in red type, all the "Notices to Mariners" issued during November 1883, an explanation of symbols, and a summary of the Weather Report for the month of November.

North Atlantic Ocean, Pilot Chart of the—. No. 2, January 1884. Prepared by order of the Bureau of Navigation, Commander J. R. Bartlett, U.S.N. Hydrographer. U.S. Hydrographic Office, Bureau of Navigation, Navy Department Washington D.C. With a pamphlet.

A statement which accompanies this chart, contains information as to the positions, at given dates, of no less than twenty-two wrecks. The great value of such information becomes at once apparent when we read such notices as the following, which refer to wrecks which constitute a positive danger to navigation:—"No. 2. An abandoned schooner with her stern knocked in was sighted 45 miles east of Cape Ann." "No. 4. December 9. A sunken wreck was passed showing one mast eight feet out of water, with three small spars attached, in 17 fathoms of water. Fire Island Lighthouse bearing N.E. by N. $\frac{1}{4}$ N. distant 14 miles." "No. 14. In latitude $27^{\circ} 20'$ N., longitude $60^{\circ} 10'$ W., a large ship or bark was sighted, bottom up. Most likely wreck No. 14 on December Pilot Chart."

The positions of all wrecks, stranded and others, are laid down on the chart, and so may easily be avoided. Wreck No. 4, which is stranded off Long Island, is an illustration of the use that can be made of the 'Pilot Chart of the North Atlantic Ocean' to avoid dangers of this sort. The meteorological information given must also be of the highest value to seafaring men of all nations.

— — — Pilot Chart of the— . No. 3, February 1884. Equatorial scale 3.7 degrees to an inch. Prepared by order of the Bureau of Navigation, Commander J. R. Bartlett, U.S.N., Hydrographer. U.S. Hydrographic Office, Bureau of Navigation, Navy Department, Washington D.C. With Supplement.

This chart contains the usual amount of valuable information. It gives the positions of no less than 14 wrecks, any one of which constitutes a serious danger to navigation.

United States Charts.—No. 29, South Atlantic Ocean. The Coast of Brazil. Sheet II. Pernambuco to Bay of Espiritu Santo. From the most recent French and Brazilian Surveys. Corrected to 1883. Price 1s. 8d.—No. 30, South Atlantic Ocean. The Coast of Brazil. Sheet III. Bay of Espiritu Santo to Entrance of

Rio de la Plata. From the most recent French, British, and Brazilian Authorities. Corrected to 1883. Price 1s. 8d.—No. 97, Harbor of Uafato, Island of Upolu U.S. Ex. Ex., 1841. Saluafata Harbor. Surveyed by the Officers of the German Imperial S. Bismarck, Captain Deinhard commanding, 1880. Corrected to 1884. Price 10d. Hydrographic Office, Navy Department, Washington D.C. J. R. Bartlett, Commander U.S.N., Hydrographer to the Bureau of Navigation.

ATLASES.

France et de l'Europe, Atlas des bassins des grands fleuves de la——, d'après les documents les plus autorisés par A. Vuillemin. Edition avec tracé des lignes de chemins de fer. Paris, Delalain. Price 10s. (*Dulau.*)

Switzerland.—Topographischer Atlas der Schweiz im Masstab der Original-Aufnahmen nach dem Bundesgesetze vom 18 Dezember 1868, durch das eidgenössische Stabsbureau unter der Direktion von Oberst Siegfried veröffentlicht. XXIII. Lieferung. No. 69, Aadorf. 71, Bichelsee. 111, Balsthal. 113, Wangen. 146, Hölstein. 148, Langenbruck. 155, Rohrdorf. 214, Sternenberg. 219, Herisau. 221, Schwellbrunn. 222, Teufen. 230, Wald. J. Dalp, Bern. Price 13s. (*Dulau.*)

United States.—Atlas to accompany the Monograph on the Tertiary History of the Grand Cañon District, by Captain Clarence E. Dutton, U.S.A., Department of the Interior, United States Geological Survey. J. W. Powell, Director. Washington 1882. Julius Bien and Co. Lith. New York.

This Atlas contains the following:—Sheet I.: Title page and Table of Contents.

Sheet II.: Sketch map, showing the approximate distribution of the strata in the western part of the Southern Plateau Province. Scale 1:1,000,000. The topography of the coloured portion is compiled by J. H. Renshawe, from data and surveys by the United States Geographical and Geological Survey of the Rocky Mountain Region, J. W. Powell in charge, and by the United States Geological Survey, Clarence King Director. The topography of the uncoloured portion is compiled largely from surveys under the direction of Captain George M. Wheeler, U.S. Engineers. Geology by C. E. Dutton.

Sheet III.: Sketch map showing the approximate arrangement of the principal faults and displacements in the District of the High Plateaus, and in the Grand Cañon District. The topography is the same as that of the preceding sheet.

Sheet IV.: Panoramic view of the Temples and Towers of the Virgin. Drawn by William H. Holmes.

Sheet V.: View of the Toroweap Valley, looking north from Vulcan's Throne, and view of the Uinkaret Plateau, looking north-west from the same standpoint. The two views are continuous. Drawn by William H. Holmes.

Sheet VI.: View looking eastward from Vulcan's Throne disclosing the Inner Gorge of the Grand Cañon, the great esplanade, and the upper or outer walls on either hand. Drawn by William H. Holmes.

Sheets VII. and VIII.: Map of the Uinkaret Plateau. Topography by J. H. Renshawe. Geology by C. E. Dutton. Scale 1 mile to the inch.

Sheet IX.: Panoramic views from the summit of Mount Trumbull, on the Uinkaret Plateau, looking eastward and southward, with distant glimpses of the Kanab division of the Grand Cañon and some of its lateral gorges.

Sheet X.: Two views, one looking northward from the summit of Mount Trumbull, the other looking north and north-east from the summit of Mount Emma, exhibiting the basaltic cinder cones of the Uinkaret Plateau. Drawn by William H. Holmes.

Sheets XI., XII., XIII., and XIV.: Map of the southern portion of the

Kaibab Plateau, and of the Kaibab division of the Grand Cañon, and of the lower portion of the Marble Cañon. Topography by Sumner H. Bodfish, and geology by C. E. Dutton. Scale 1 mile to the inch. The inner gorge, designated as an Archæan area, contains remnants of Silurian strata, the extent and distribution of which are not at present accurately known.

Sheets XV., XVI., XVII. The Panorama from Point Sublime in the Kaibab. The three sheets form one continuous panorama. Drawn by William H. Holmes.

Sheet XVIII.: The Transept. View of a lateral gorge opening into one of the branches of the Bright Angel Amphitheater in the Kaibab. Drawn by Thomas Moran.

Sheet XIX.: View looking from the eastern brink of the Kaibab, and over-looking the Marble Cañon Platform. Drawn by William H. Holmes.

Sheets XX., XXI., XXII., and XXIII., Sheets from the General Topographic and Geologic Atlas of the United States Geological Survey.

It is to be regretted that the survey of this portion of the country is not yet sufficiently advanced to admit of the construction of two additional sheets required to complete the cartography of the Grand Cañon District. It was desired that this atlas should contain the two sheets lying west of sheets XXII. and XXIII. of this atlas, but although much material has been obtained for their construction, much more is still required. No attempt to supply the defect has therefore, been made in the present work.

Vendée.—Atlas cantonal de la—; canton de Saint-Fulgent (France). M. Désiny. Paris, Erhard, 1883. (*Dulau.*)

EDUCATIONAL.

Deutschen Reiches, Wandkarte des—, zum Schul- und Comptoir-Gebrauch bearbeitet von H. Kiepert. Scale 1:750,000 or 10·3 geographical miles to an inch. Dietrich Reimer, Berlin, 1883. 9 sheets. Siebente Berichtigte Auflage (*Dulau.*)

In this map, all roads, railways, and canals are laid down, and the topographical features are clearly shown. The contrasts of colour are well chosen, the lettering plain, the type indicating the populations, and it is not over-crowded with names. The map is beautifully drawn, and is well worthy the attention of all students.

Europe.—School Map of—. Scale 1:3,800,000 or 52 geographical miles to an inch. G. W. Bacon, London, 1884. On rollers, varnished. Price 15s.

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PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

*Mr. Frank Lupton's (Lupton Bey) Geographical Observations in the
Bahr-el-Ghazal Region: with Introductory Remarks by Malcolm
Lupton.*

(Read at the Evening Meeting, March 10th, 1884.)

Map, p. 304.*

THE Province of the Bahr-el-Ghazal which we are for a short time to consider to night, is that tract of country which lies between $6^{\circ} 30''$ and $9^{\circ} 30''$ N. lat., and roughly speaking from 25° to 31° E. long. It is bounded on the north by the Bahr-el-Arab, and stretches in the south to within a few days' march of the Congo.

The principal geographical features are the vast plains or steppes and the dense forests, many of which cover areas of hundreds of square miles. In the rainy season, most of the country in the depression of the Ghazal is under water, it being very difficult to find a dry piece of ground to camp upon.

Previously to 1878, this province was entirely in the hands of the slave-dealers. In that year Gessi Pasha, after the most sanguinary fighting, managed to crush their power. As soon as this was done he undertook the work of establishing a good and just government, and did much to restore the confidence of the natives and open up a legitimate trade. Unfortunately his death in 1881 deprived the country of his just though somewhat severe rule.

Mr. Frank Lupton, whose love of travel had taken him to the Soudan, was appointed by Gordon Pasha in 1879 to the post of Deputy-Governor of the Equatorial Provinces, under Emin Bey, in conjunction with

* The map is a reproduction, with some improvements, of Mr. Lupton's very rough original. We have retained all the positions of the places lying along Mr. Lupton's routes, as well as the general hydrographical features of the countries traversed by him. We have also accepted the position of Zemio's residence as given by Mr. Lupton, and the details of the Mbomo river, as shown on his sketch-map. But all beyond these limits is taken from the Society's map of Eastern Equatorial Africa and from other sources. Names which do not appear on Mr. Lupton's map are written in skeleton letters. The route, as indicated by us, is merely approximate.—[E. G. B.]

No. V.—MAY 1884.]

whom he explored the countries of the Bari, Latuga, and Shooli, particulars of which appeared in Petermann's 'Mittheilungen.' On Gessi Pasha's death, he was made Governor of the Ghazal Province, and reached there towards the close of 1881.

The principal tribes inhabiting this immense region, are the Bongo, Denka (or Dinka), Golo, Sehre, and Jur. The country of the Bongo lies between latitudes 6° and 8° on the south-western depression of the Ghazal basin. It covers an area of about 11,000 square miles. The natives, a mild-tempered race, fell an easy prey to the Khartumers, who after the year 1856, when they established themselves there, carried them off as slaves by the thousand. Unlike the Denka, they had no idea of uniting together, but allowed the Nubian soldiers to take one community after another, until the whole were brought into a state of vassalage. The result of which was that in a few years large districts, once thickly populated, were nearly deserted, the entire population now not exceeding 100,000. The complexion of the Bongo is of a red-brown, like the soil on which they live. The men only think it necessary to wear clothing. With the exception of some occasional hunting and a little fishing, they depend entirely upon the produce of the soil for their subsistence.

The Denka territory extends over an area of about 60,000 square miles; Schweinfurth stayed in this country for two years, and gives in his book, 'The Heart of Africa,' an excellent account of the different tribes inhabiting the Ghazal region. This warlike people, the Denka, are described as belonging to the darkest of races, as being clean in their persons and in what they eat. They turn all their attention to cattle-rearing, and possess immense herds. Their principal weapon is the lance. In strange contrast to the Bongo, the Denka men entirely dispense with clothing, but have the women well dressed.

The country of the Jur lies between that of the Denka and Bongo; it is not extensive and the population is not large. They are principally noted for their working in iron.

To hold this vast territory Lupton Bey has had six companies of regular troops, and four of Bashi Bazouks. These generally keep in the stations and look after local affairs. But the great strength of the Government lies in the Basengers or armed slaves, who were formerly in the service of the slave-dealers. Their arms consist of double-barrelled guns, with which they are pretty good shots. They make faithful soldiers, and cost but little; a few handfuls of grain being all they require in the way of food, and clothes they consider quite unnecessary articles. Most of them are recruited from the Niam Niam country. They do all the really hard work and fighting of the province.

As regards trade, ivory is the best paying commodity the country produces. Indiarubber, gum, and tamarinds are plentiful, but hardly pay the cost of transport. Enough cotton could be grown to supply the whole world. The country is also rich in good timber, which is sent to

Khartum for building purposes, more especially for the diabeahs of the Nile. It is from ivory and wood that the chief source of revenue is derived.

Trading with the natives is extremely difficult. Their treatment in the past has been so inhuman that they view with suspicion any strangers entering their country, and invariably send off their women and property to the mountains on hearing of the approach of a trading party. But confidence is being gradually restored, and in a few years, with good government, we may expect to see the whole province opened up to legitimate commerce.

The climate of the Bahr-el-Ghazal varies with the seasons. During the rains, which last for about five months, the country is turned into a vast swamp, and is consequently most unhealthy. During the dry season it is tolerably healthy; but near the river none but natives are free from ague and fevers. The climate improves wonderfully on leaving the river, and Lupton Bey thinks most Europeans could live and enjoy life in the interior, providing that life was an active one.

Having made these introductory observations, I will now read the geographical portions of Lupton Bey's recent letters:—

JUR GHATTAS, *Nov. 6th*, 1883.

I send you a rough sketch-map on a small scale of a part of this province. From it you will learn all about the rivers of this part of Africa. The latitudes of some places are by observation, others are by dead reckoning.

I have only one map of Central Africa here, the one published by Petermann in 1877.* I learn from it that the Kuta and Congo are the same river, and that, south of Dar Banda, it runs west a little south in lat. 4° N. This is not correct; the Kuta south of Dar Banda runs to the westward, but is north of the 5th degree of north latitude. I have not yet been able to visit the river myself, but when in Dar Banda last year, sent a man who brought me all particulars about the road. Barusso station is a little over 44 hours' march from Foro, bearing about south by west, distance 90 miles. The journey was done in seven days:—

		h. m.	
1st day,	Foro to Birria	7 30	Sultan Dukey.
2nd „	Birria to camp in forest	6 30	
3rd „	Camp to Engoe River ..	6 15	
4th „	Engoe to Talbo	5 45	Sultan Mofio.
5th „	Talbo to Engoe	6 0	
6th „	Engoe to Yargosso	6 15	
7th „	Yargosso to Barusso ..	6 0	On the Kuta.
		<hr/> 44 15	

* The map here referred to is No. 22 of Petermann's 'Mittheilungen' for 1877, entitled "Standpunkt der Erforschung von Äquatorial Africa, 1877."—Ed.

If the map to which I refer is correct, and the Kuta is the Congo as marked, the Welle is also the Congo, for the Kuta is formed by the junction of the rivers Mbomo and Welle; they meet at a place called Mabela, about 13 hours' march east of Barusso station.

I am also told that four days' march west of Barusso a big river joins the Kuta, coming from the south, but owing to my man not having made a note of the name, I cannot give it you. Dr. Junker, the Russian traveller, writes me that he believes the Welle to be the Shary, which flows to Lake Chad, adding that he would give me his reasons for this opinion when we meet, which will probably be soon, as I have invited him to visit me at Dem Zibër.* He is at present living with Sultan Zemio. I can only say that whether the Kuta be the Shary or not, the Welle joins it. Foro on the map I have is placed too far west. I should like you to refer to the books of Barth, Nachtigal, and Stanley, and learn what they say about the Kuta. It seems to me that Lake Chad is too far away from Barusso, where the Kuta is from two to three miles broad, for such a river to flow to it; if I remember, the Shary at its mouth in Lake Chad is only about half a mile broad, much smaller than the Kuta at Barusso.

I have learned very little more about the Mbwikeyebay † Lake, but have been told that it is also called Kuta el Kebir.

Dr. Junker, in the small map which he sent me, has marked a lake of the same name connected with a large river which he thinks is the Congo, but is called, I am told, Nungo. The lake is, according to his map, not more than 20 miles broad and 30 long; he did not visit it himself, but as he went to some of the islands in the Makua, I have no doubt he received reliable information about it there. He has placed it on his map in the same position as I gave it when I first wrote about it. Between the Makua and the Nungo (which river I think joins the Kuta four days' march west of Barusso) there are several large rivers: the principal are the Rubi, which joins the Welle, the Terre which joins the Rubi, and the Mombago which runs into the Nungo. Is the Nungo the Lualaba, and the Welle the Aruwimi? The tribes living between the Makua and Nungo call themselves Mubensa and Mubenge; they inhabit the country near to Makua; the Barboa, Baganyero, Bumame, and the Buputta are scattered about between Makua and Mombago; to the south and west of

* Mr. Lupton revives the old name of this station, which was founded by Zibër (or Sibehr) Pasha. Gessi and others call the same place Dëm Soliman, after Zibër's son.—Ed.

† Thus the name of the lake appears to be spelt on Mr. Lupton's map, whilst the editor of the 'Mittheilungen' (1882, p. 423) reads "a lake called by the inhabitants of Bur 'Key el Aby.'" We may here mention that, according to Mr. Lupton's note in the 'Mittheilungen' and in the 'Proceedings' (1882, p. 685), the lake lies 14 days' march beyond the Makua river, whilst on the sketch-map now forwarded by him he writes against the Makua: "Six days' journey to the lake Mbwikeyebay, which is connected with a river larger than the Welle, no doubt the Lualaba or Congo. It is said to run due north and join the Kuta." Another puzzle!—Ed.

that river dwell the Banyambay. The inhabitants of islands in Makua are called Basango.

The Banda and Ingany dwell in the country round about Barusso station, and south of the Kuta the country is called Rembeshe or Limbeshe. On my map I see Rembeshe is marked as being north of Kuta; this is a mistake. I should much like to visit the countries south and west of this province, but owing to this confounded revolt, I dare not go very far away from headquarters. If things improve here I shall at once make a long journey of exploration to the south-west. Dr. Schweinfurth on his map has marked the rivers Pango, Kuru, and Biri, as joining the Bahr-el-Arab. This is not correct, as they all run into the Bahr-el-Jur. During five months of the year most of the rivers are navigable. On the little map I have sent you you will observe crosses; these mark the points on the rivers to which boats drawing not more than five feet can go without any trouble. I expect the Government will give me a small steamer this year; she will be a great help to us here. I have more than 2500 cwt. of ivory and 300 cwt. of indiarubber, but at present cannot get it down to the Meshra, for I require at least 8500 porters to transport it. How am I to feed these, and the soldiers who would have to go with them, to protect them against the Janghe or Denka? Had the little steamer been sent here as promised, the Government would have been 100,000*l.* the richer.

It is hard lines to be placed so far away from headquarters; those in power at Khartum are apt to forget all about us here; it is only twice a year steamers are sent to Bahr-el-Ghazal. This province is one of the largest in the Soudan, and the richest, and yet we are less thought about than the others. I am the only one of the Soudan governors that can give this year to Government a clear profit of something like 60,000*l.*

A Dutch traveller, Mr. Schuver, came by the steamer *Ismailia* from Khartum to Meshra-el-Rek, with the intention I believe of trying to reach the new Lake Mbwikeyebay, but it was not to be. Two days after arriving at the Meshra he determined, against every one's advice, to start for Jur Ghattas; the Nazir and officers there would not at first let him go, and refused to give him either a guide or porters, owing to the road being blocked by the Janghe, and knowing the impossibility of his ever reaching the Jur alive. Mr. Schuver was furious at being detained, and resented the interference of every one who advised him for his own good. He produced a paper from the Governor-General saying that the Government had given him permission to go where he liked, that Government servants were not to detain him, and that if anything happened to him Government should not be held responsible. The Nazir seeing this paper, feared that if he still refused to let him go, he would be breaking the Governor-General's orders, so he gave him a dragoman and five Basengers, and Mr. Schuver gave the Nazir a letter declaring that should anything happen to him on the road the Government was to be

held free from all blame. He then put all his goods in a cabin in the steamer, locked the door and sealed it up, and he and his dragoman Karlo, the Janghe (Denka) dragoman Anyar, and the five Basengers started for Jur Ghattas. Arriving next day at Rek, at Sheik Kutche's village, he was killed with his dragoman and the five Basengers. The Janghe dragoman Anyar was made prisoner, but after some days was rescued by his relations, who attacked Kutche's village, and set him free. Anyar is now here with me, and I shall send him down to Khartum, where he will be able to give to the Consul all particulars relating to the affair. Suttie Effendi burnt Kutche's villages, but we have not yet been able to catch and punish the murderers; they will not much longer escape us, for I am now collecting 1000 men, and will in a few days send them against the Rek tribe. I defeated the Tonj Molih and Ayar tribes last week, the enemy losing 400 men and 350 head of cattle. We shall, I have no doubt, beat the Janghe this year. The grass will soon be burnt off the steppes, but we must wait till the dry season sets in; at present it is almost impossible to get at the enemy, the country being almost under water and no provisions to be had. I start for Dembo in a few days, and intend to take 500 men from there and build a stockade half-way between that station and the Meshra; the men who go to punish the Rek tribe, after having done so, will join me there, and together we shall, I hope, be able to beat Mayendut, the great vakhil of Mr. Ahmet the Mahdi; he is in possession of the green flag that was sent by the Mahdi to be carried before the men who fight for him. The flag that was given to the Rizegat chief, Ballal Nagur, was captured by Rafai and is now in my possession. Rafai was killed in an engagement with the Denka; he was one of my best officers and I miss him a great deal.

This province is better off than most of the others in the Soudan, the only tribes which have revolted here being the Janghe, the Nouer, the Dembo, and the Mandala,* and that is owing to their being mixed up with the Arabs, who have without exception joined the Prophet. My negro tribes, Niam Niam, Bongo, Golo, Krej, Banda, and Shere, are quiet and happy enough. Those who live near the Denka have suffered a little, the Janghe (Denka) having last year burnt the grain before it was cut; indeed, we have been very near starvation, but next month the new corn will be ripe; we then will collect as much as possible of that planted by the Janghe, and if I manage to defeat Mayendut, we shall without much trouble fill our schooners.

I will by-and-by write you a long account of what has happened here during the last year, but at present I cannot spare time. I am kept at work from morning till night; what with getting the official post ready,

* The Mandala, according to Gessi, are immigrants from Bagirmi, who settled in northern Dar Fertit. They are mostly Mahomedans. The Dembo are a tribe of the Lur or Jur. The Jeng or Janghe are the same as the Denka.—Ed.

fitting out the Rek expedition, &c., I have not one minute to spare. But after I get rid of the steamer I shall have a little spare time, and will then write you at greater length. I have no time even to be ill, and I believe work is the thing to keep one in health here. My advice to all Europeans is, to wear flannels, live on what the country produces, drink no spirits, and take plenty of exercise. If these things are attended to I believe Europeans would get along here very well. My life here suits me well enough, but I am inclined to think not many Englishmen would like it. Nubians and negroes are not at all nice companions, and it is not every one that would live with them as I do.

The little map I send is only a part of the work I have done here. Some time ago I sent a copy of it to Emin Bey to be forwarded by him to Dr. Behm, but the steamer has not yet, I believe, gone to Lado. I have no instruments or paper here with me, or would have sent you a map on a large scale, with all the small streams and villages, hills, &c., marked on it. The one I have sent is only intended to give you some idea of the rivers here. If you like to make any extracts from my letters for the Royal Geographical Society you may do so. I hope to be able soon to make a long journey, and should I discover anything new I will at once report it to the Society. They will no doubt be pleased to learn more about the Kuta and Makua rivers.

I append the observed latitudes and heights.

	Lat. N.		Height in feet.
	°	'	
Meshra er Rek	8	17 36	—
Jur Ghattas	7	16 31	—
Wau	7	34 35	—
Dembo	8	9 35	—
Dém Zibër (Soliman)	7	38 0	1985
Boko	7	53 45	2574
Mbarfery	7	8 47	2299
Aja	7	5 0	—
Marra	6	45 0	1980
Anyauer	6	44 6	2190
Mbunga	6	28 6	2267
Dém Bekir	6	48 52	—

JUR GHATTAS, *November 5th, 1883.*

I have surveyed the chief rivers of my province, and found that they are navigable during six months of the year. This will be a great help to me, for it will lighten the burden of the negroes and save many lives which are inevitably lost on the long journeys by land. In a desert country it is impossible to transport ivory for any great distance without loss of life and much suffering from thirst, hunger, and fatigue; there are no transport animals, and water and provisions are scarce. Horses, mules, donkeys, camels, and other beasts of burden will not live more than one year here, and the Denka cattle are not strong enough to be used for transporting goods. I tried the Baggara cattle, but they all

died in a very short time. In the pastures of the Janghe (Denka) districts they do well enough, but as soon as they enter the high lands it is all over with them.

Nothing would please me better than to undertake a journey of exploration into the unknown interior, did my duties here permit it. I should have no difficulty with the tribes for I know Arabic well, and am well acquainted with the manners and customs of the Soudan. The Mahdi war alone has prevented me from settling long ago the question regarding the direction of the Welle river and the new lake about which I wrote some months ago. I have not yet finished my large map, but send you a rough sketch on a smaller scale. Had I known that my poor work would have been accepted by the Royal Geographical Society, I would have sent you before this the whole of the information I have gleaned about this province. When I wrote what I knew about the new lake discovered by my agent Rafai Aga, I was in doubt whether it would be noticed or not. I am very glad you have made me a member of the Society, and in future will send all my notes and maps to you for them. Hitherto they have gone through Emin Bey to Petermann's 'Mittheilungen.' By this steamer I have sent a small box full of native weapons, utensils, &c., addressed to you, which please present with my compliments to Mr. Franks, of the Ethnological Department of the British Museum. I am badly off for maps of Central Africa. Can you not manage to send me the latest published? Mine are all old ones, not worth anything. Dr. Schweinfurth's map of this province contains serious mistakes. You will see the difference from my map; his book is most instructive and interesting, but his map is bad. I cannot write you about the fighting that has taken place here with the Mahdi's followers; it would fill a volume. It must suffice to say I am well and safe at present, and I hope the Denka have killed enough of us to satisfy them; at least one-third of the Government defenders of the Province have gone, never to return, and no one knows what the morrow will bring forth. Let us hope peace will soon be restored and the slaughter stop; we have had enough to satisfy the most bloodthirsty.

Hunting is my chief amusement when I have spare time. I have good horses and rifles, and have killed more than 1000 head of big game since I came to the Soudan; rhinoceros is the only large animal I have not been able to bring down; giraffes are plentiful, and we are compelled to hunt them for food. Antelopes are also extremely numerous, both in individuals and in species. I would venture to say that there are nearly one hundred in all to be found here. I have killed large numbers of hippopotami and buffaloes. I have found the buffalo to be the worst gentleman to deal with in the African forest. Elephants and lions cannot be compared with him. Every one here is of the same opinion. Some five to six thousand elephants are killed here every year and yet there is plenty of them. I cannot make it out;

one would think they would be exterminated, but there is no sign of it at present. I have tried hard to capture young ones and bring them up, but they always die. Tusks here average 25 lbs. each, but I have had a pair weighing 366 lbs., one being 184, and the other 182 lbs. Rouf Pasha took them with him to Egypt. I have some nearly as large here now, but 4000 pieces weighed 1100 cwt., the average is therefore a little over 25 lbs. each (ivory weight).

I will send you, for the Royal Geographical Society, all the information I have gathered about the Soudan. I have a map of Petermann's in which the Congo is marked as running as far as 4° north latitude. If that is true, I have not the least doubt that the Welle flows into it. According to a map I possess, the Congo and the Kuta, or Kabunda of Barth, are one and the same river. I have now two or three stations on the banks of the Kuta, and men whom I have sent out have bought ivory from the tribes south of the river. I should have reached as far myself, but was obliged to return from Dar Banda near Aja, six days' march from the Kuta. Any account of Stanley's recent operations on the Congo and the position of his stations on the river would be very useful to me.

I cannot at present undertake a long journey of exploration, the war with the tribes who have espoused the cause of the Mahdi keeping me hard at work, but I hope as soon as it is over to start from here and visit the countries to the west of my province, or to Dar Rembeshe, which country is six days' journey south of the Kuta, and not as marked on Petermann's map to the north of it. The country called Tembogo on the map is also I think an error. On my journey last year to Aja, I found a chief of the name of Dembugwo; the country marked Tembogo has probably been called after him.

To T. P. Hearne, Esq.

F. LUPTON.

The PRESIDENT, in his introductory remarks, before the reading of the foregoing paper, said that it would be read by the author's younger brother, E. Malcolm Lupton. Lupton Bey was originally employed by General Gordon in a very important but subordinate position at Lado, in the equatorial regions of the Nile. There he remained for some time with Emin Bey, the governor of that interior province, until a vacancy occurred in the vast province of Bahr-el-Ghazal by the death of Romolo Gessi, when he was promoted to be governor there, and had been there ever since. Of late years, with a small force he had been holding his own against the fanatical hordes of the Mahdi, having been in conflict with them no less than twenty times. On the whole he had been victorious, but his own military forces were so small that he had great difficulty in maintaining himself. The Bahr-el-Ghazal district was first fully described by one of the greatest of modern travellers, Schweinfurth; but the position of Lupton Bey had enabled him to add much to the information which Schweinfurth obtained.

After the paper,

Colonel GRANT said that the Welle was supposed by Schweinfurth to be connected with the Congo system, and believed that Lupton Bey would prove Schweinfurth's

idea to be correct. The Soudan proper originally consisted of the country between 20° and 10° north latitude. Sixty-two years ago this was taken possession of by Mahomet Ali. As years passed on, Darfur was taken and Baker and Gordon carried the Egyptian flag still further south, following the Nile stream as far as the territory of King Mtesa of U-ganda; but it was impossible now to say where the boundary of the Soudan was. It was ridiculous to suppose that Egypt could control the whole of that region, and he did not believe in the ability of the present native chiefs to govern. When Speke and himself came to Mtesa's country, they found it governed as well as India is by the English. It was true that the natives had some barbarous customs, and that slavery prevailed, but what he meant to say was that the whole country was under as much control as India. The Wa-ganda took a pride in their country, and were a united and splendid race, whereas in the Soudan there was nothing but perpetual strife and bloodshed, caused by ivory-traders and hunters in slaves against the poor inhabitants. He should be extremely sorry to hear of Mtesa's country ever falling into so degraded a condition as the Soudan. In passing from U-ganda, Speke and himself came upon slave- and ivory-hunters, like Zebehr Pasha. They were in a very comfortable village, were armed to the teeth, and were in the habit of going out and making raids for ivory. He had always previously thought that the Egyptian soldiers were great shots and bold dashing fellows, but a more cowardly set of villains and cut-throats he never met with. They were the most brutal people that Englishmen could imagine, and they had not improved from that day to this, but had rather gone from bad to worse. Whenever they approached a village, the villagers would fly away, and he and Speke had to travel as though they were passing through an enemy's country. Further south, in the native kingdoms, they were treated as friends, sleeping in the villages occupied by the natives, but directly they got into the Egyptian territory they had to march in squares, as in an enemy's country, just as our army at El Teb marched the other day. At Gondokoro they found a Circassian, named Kurshid Aga, who was living in great state and called himself king of the country; he had four hundred well-armed slaves and cared not how he got slaves and ivory. All the way down the river their lives were in great danger, in consequence of the natives being so infuriated against those representing the Turkish Government. He was happy to think that there was now a prospect that the Turkish Government would be abolished; but it should be remembered that the Soudan is a country larger than the British Isles, Portugal, Spain, France, Belgium, Holland, Germany, and Austria taken together, or in area equal to one million square miles, with eleven million inhabitants, and that if it were governed like the Punjaub it would become a granary for Europe.

Dr. JAMES MURIE said that twenty years ago he met Colonel Grant at Gondokoro, and thirty years ago he was at Benin and went far into the interior of the country on that side of Africa. Since that time the Soudan and Central Africa had gradually become questions of great public interest in this country. Those who know the country would acknowledge that the work of Lupton Bey was of a highly interesting and useful character. His paper must be taken in two aspects, first as a geographical communication and next as possessing special interest in consequence of the present prominent position of the Soudan question. Nearly the whole of the Sahara was a plateau or plain with here and there elevations, the formation being red sandstone which extended almost to the centre of Africa, where there was more hilly land, and from that hilly land the three great rivers, the Nile, the Niger, and the Congo flowed. The region between the bend of the Nile near the Ghazal river, and Khartum was at one time in possession of a powerful people constituting a great kingdom; this was the Denka tribe, and he himself saw that kingdom just when

it was beginning to disappear, and slavery was commencing. Two years afterwards the region was desolate. The Shooli tribe had for a long time defied the Egyptian Government, and had in fact now and again made raids on Khartum itself. Although the credit had been given to Schweinfurth for discovering the Welle, Consul Petherick made known its existence many years before. The Bahr-el-Ghazal region was the commencement of the rising chalk country, and a little further south mountains cropped up here and there belonging to the granite and other formations. A line drawn straight across in that region would be the barrier which divides the Congo from the Nile. Therefore the Welle must flow to the north.

The PRESIDENT, in conclusion, said that what had been read was a sufficient reply to those who believed there was no further work to be done by geographical explorers. In the vast region between the Niam Niam country and the Congo and the sources of the Benue on the one side, and in the land of the Gallas and the Somalis, wide tracts of unknown country still remained. The reading of Lupton Bey's letters, which conveyed vividly the impression of the moment, and were not the less interesting because they were not arranged into a formal paper, called to mind the fact that they were written within a few days of the disaster which overtook Hicks and his army. The knowledge of that circumstance must make every one look forward with anxious interest for the next news of such a gallant and enterprising traveller, who, if his life be spared, will undoubtedly make known regions which at present were the objects of eager curiosity. The country through which the Arnwimi and the Welle flow is the very part which Mr. H. H. Johnston had proposed to visit before he decided to go to Mount Kilimanjaro, his intention having been to leave the Congo at its northern bend and make his way across to the waters of the Nile. In so doing he would probably have settled the question of the direction of the Welle. He had, however, been naturally deterred by the disturbed state of the Soudan, which made that portion of it inaccessible at present to European travellers.

*Somal and Galla Land; embodying information collected by
the Rev. Thomas Wakefield.**

By E. G. RAVENSTEIN.

(Read at the Evening Meeting, March 10th, 1884.)

SINCE the labours of Livingstone and Stanley, and of their successors, have revealed to us the broad outlines of the geography of Southern Equatorial Africa, there exists no region in that continent equal in extent or richer in promise of reward to a bold explorer than the countries of the Somal and Galla. Stretching away for 1200 miles from Cape Guardafui into the basin of the Upper Nile, we are acquainted as yet with hardly more than its fringe, except immediately to the south of Abyssinia, where a broad wedge has been driven right into its centre. Our maps of the greater part of this region are still based upon frag-

* *Vide* the R.G.S. Map of Eastern Equatorial Africa, by Ravenstein, sheets 8-6 and 9-11.

mentary native information, and he would be a bold man who asserted that he possessed a definite knowledge of even its most elementary hydrographical features.

Vainly do we look to the ancients or to the Arabs for definite information respecting the interior of these territories, and although Fra Mauro, in his map of the world (1457) has given us a picture of Abyssinia, surprisingly correct as to certain details, though fearfully exaggerative with respect to distances, and even indicates a river Xibe, which in its lower course assumes the name of Galla, and finally finds its way into an arm of the Indian Ocean, against which is written the word "Diab," it is only since the Portuguese, in their victorious career round Africa, extended their researches inland into the country of Prester John, that our geographical knowledge assumes a definite shape. As early as 1525, Jorge d'Abreu, one of the gentlemen attached to the mission of Don Rodrigo de Lima, accompanied an Abyssinian army into Adea. He is the first European who stood on the shore of Lake Zuway, and up to within the last few years, the only one. Subsequently (1613) Antonio Fernandez vainly tried to make his way through the Galla countries to the Indian Ocean, and although he failed in his main object, he yet visited Kambate and Alaba, countries which no European has beheld since. A few years after him, in 1624, Father Lobo walked from Pata to the mouth of the Jub in search of an inland route to Abyssinia. He too failed; but the names of the twelve tribes, through whose territories he was told his route would lead, have kept their place on our maps down to the beginning of the present century, and this represented nearly all we knew with respect to it.

It may with truth be stated that the map of Abyssinia published by Tellez, is a geographical monument which does credit to the enterprise and capacity of these early Portuguese explorers. And if, during the last two centuries, Portugal, exhausted by efforts quite out of proportion to the number of her children, has allowed the stage of geographical exploration almost to be monopolised by others, it is all the more gratifying to find that in these latter days she has once more sent explorers into the field, whose scientific accomplishments are quite on a par with those of other nations.

Until far into the nineteenth century our knowledge of the countries under review can hardly be said to have increased, and when the work of exploration was resumed, it was Englishmen who stood in the van. Whilst Lieut. Carless and other officers of the Indian Navy were busy surveying the coast, Colonel Rigby, then on service at Aden, collected useful information on the interior, and first wrote an outline grammar of the Somal language. Lieut. Christopher, however, was the first to make important discoveries (1843), for during three trips inland, from Barāwa, Merka, and Mokhdesho (Magadoxo), he came upon the lower course of the Wébi Shabēla, which he named the Haines river. M. Guillain,

whose book on Eastern Africa will always maintain its place among geographical standard works, visited the same river in 1847, and determined the latitude of Geledi.* M. Léon des Avanchers, although he made no excursions into the interior, yet greatly extended our knowledge by careful inquiries among travelled natives, and it is to be regretted that only a mere outline of his itineraries should have been published. In 1865 Baron von der Decken achieved a great success by ascending the Jub to beyond Bardera, and if the explorer himself lost his life in this enterprise, it is some consolation to us that the results of his work have been saved. The Jub has since been ascended for a considerable distance by Colonel Long, who was attached to Admiral McKillopp's squadron, despatched to the east coast of Africa, at the instigation of Gordon Pasha, with orders to take possession of a suitable point whence overland communication might be established with the Egyptian stations on the Upper Nile.

In Northern Somal Land, Lient. Cruttenden is entitled to the credit of having first penetrated into the interior of the country, for Mr. R. Stuart, whom Salt despatched to Zeyla with instructions to proceed to Harar, never left the coast; whilst Lient. Barker, who endeavoured to reach that point from Shoa in 1842, failed in his enterprise. Mr. Cruttenden looked down from the summit of the Airansid upon the broad vale of the Tok Daror, or "river of mist" (1848). Captain Speke extended these explorations six years afterwards; and Captain Burton, in 1855, achieved one of those triumphs which it is given to few travellers to achieve. He reached Harar, the old capital of Adea, the first European who did so, although that town lies within a few marches from the coast, and was known by report to the old Portuguese. Among more recent explorers we may mention Henglin (1857), whose excursions inland have not, however, been of any extent; Captain S. B. Miles (1871), who explored the Wadi Jail, to the south of Cape Guardafui (1871); Hildebrand (1873), the botanist, who ascended the Yafir Pass; Hagenmacher (1874), who pushed his way far inland to the very border of far-famed Ogaden; Graves (1879), who explored the vicinity of Cape Guardafui; and last, not least, M. Révoil (1878-81), who, during three successive expeditions through North-eastern Somal Land, did perhaps as much work as all his predecessors taken together.

In the meantime Harar had been occupied, in 1876, by an Egyptian force commanded by Rauf Pasha, and almost immediately became a focus of attraction to explorers and merchants, not, however, before General Gordon, during a flying visit to the place, had deposed the

* Geledi, in M. Guillain's book, is placed in 2° 6' N., but this appearing to me to be a misprint for 2° 16' N., I requested Captain Lannoy de Bissy to try and obtain a look at the original records. These have unfortunately been destroyed. The map, however, very clearly places Geledi in 2° 16' N., and Captain de Lannoy writes: "La carte que j'ai calquée semble donner raison à votre assertion. Je vous l'envoie avec la latitude de Magadoxo déterminée par les officiers du *Ducouédie*."

Egyptian Pasha, just as he had done four years previously when he found him installed on the Upper Nile. Giulietti, the same who was subsequently murdered in the Afar country, provided us with a good map of his route from Zeyla (1879), and Father Taurin, already favourably known through his work in Abyssinia, gave us an insight into the Galla country to the west of Harar (1880). Captain Cecchi, on his return from the coast, turned out of his way to pay a visit to Harar, and determined its latitude (1882). All efforts, however, to penetrate from Harar into the interior have, with one single exception, ended disastrously. M. Luceran, a scientific explorer in the service of the French Ministry of Education, was murdered by the Galla, when he had scarcely left that place, in 1881. Sacconi, who proposed to visit the Ogaden country, met with the same fate when about twenty days' march to the south or south-east of that town (5th August, 1883); and Lazzaro Panajosi, a Greek, shared the same fate soon afterwards. M. Rimbaud, however, a gentleman in the service of Messrs. Mazeran, Bardey and Co., is reported to have returned in safety from a trading trip into the country of the Ogaden.

Continuing our survey of the borders of the Galla Land in a westerly direction, we reach Shoa and Abyssinia, where in the course of three centuries the Galla have obtained a footing, but where they have largely adopted the language and the customs of the more highly civilised people whose territories they invaded. Taking the Hawash and the Abai as the natural boundaries of Galla Land in the north, we find that the number of modern travellers who have overstepped that line is as yet far from considerable. On the other hand, many of those who confined themselves to Abyssinia and Shoa, and more especially Dr. Beke, M. Rochet d'Héricourt, and Dr. Krapf, have collected information on these southern countries, which in our present state of knowledge proves still highly acceptable.

Lieut. Lefebvre was the first European who in modern days (1843) crossed the Hawash into the country of the Soddo Galla. He was succeeded in 1879 by Signor Bianchi, the first of modern Europeans who furnished an account of Gurage from personal knowledge. Since then Chiarini and Cecchi have travelled from Shoa through the Galla countries as far as Kaffa. The former died at Ghera from the cruel hardships which he was made to suffer, but Captain Cecchi was able to return to Europe with a rich store of solid information. Since this enterprising and arduous expedition King John and his Viceroy Menelik of Shoa have extended their sway to the south as far as Kaffa; and the first European to avail himself of the facilities for travel thus afforded has been M. Soleillet, who visited Kaffa in 1882.

The region immediately to the south of Abyssinia proper, with its bold mountains, deep valleys, and very mixed population, was first explored in a scientific spirit by M. A. d'Abbadie, who visited Bonga in

Kaffa in 1840, and traced the Gibbe to its source during a second expedition in 1846. Some useful information was likewise collected by the Roman Catholic missionaries, Massaja and Léon des Avanchers, the latter of whom died at Ghera in 1879, after a residence extending over many years.

More recent still than either of these expeditions is that of the German, Dr. Stecker, the first to visit Lake Zuway since 1525. The last explorer whose name we have to mention is J. M. Schuver, whose recent murder in the Denka country has cut short a career of great performance during the past, and much promise for the future. He was the first and is still the only European who has penetrated to the Lega Galla, in the extreme north-west of the vast Galla Land. Dr. Emin Bey, the Governor of the Equatorial Province, intended to visit the Galla tribes lying to the east of the territories over which he so wisely and successfully rules; but recent events have wrecked his plans. I may mention parenthetically that the Lango, on the Upper Nile, are generally described as Galla; and that Dr. Emin, in one of his communications to the Journal of the German Ethnographical Society, states that they are of the same race as the Latuka. If this is so, then the Lango cannot be Galla, for an examination of his vocabularies of the Latuka language shows that these, at all events, are Massai. Hence arises the further question as to the nationality of the Wa-huma, who have given rulers to U-nyoro and U-ganda, and are met with as herdsmen far towards Lake Tanganyika.

In this rapid survey of the progress of geographical exploration we have mentioned the names of a large number of travellers of merit, but a glance at the Society's map of Equatorial Africa, upon which their routes are laid down, shows that the districts explored by them are still very limited in extent, if we compare them with the regions into which up till now no European has set his foot. Under these circumstances compilers of maps are still dependent to a very large extent upon native information. Indeed, one whole sheet of the map just referred to, embracing an area of 90,000 geographical square miles, is exclusively based upon imperfect information of that kind, and several other sheets of the map are almost in the same condition.

Amongst earlier travellers to whom we are most largely indebted for information of this class are Cruttenden, Christopher, Beke, d'Abbadie, Guillaïn, and Léon des Avanchers. To these honoured names I now wish to add that of the Rev. Thomas Wakefield, who has laboured sedulously on the East Coast since 1865, and has allowed no opportunity for obtaining information on the Galla countries to escape him. Before his return to Eastern Africa in 1883, that gentleman placed in my hands a large volume of manuscript notes, and from these I have culled all such information as appeared to me to be of interest to geographers.

The Country of the Hawiyah Somal.—It will be most convenient for future reference if we arrange Mr. Wakefield's information according to the geographical

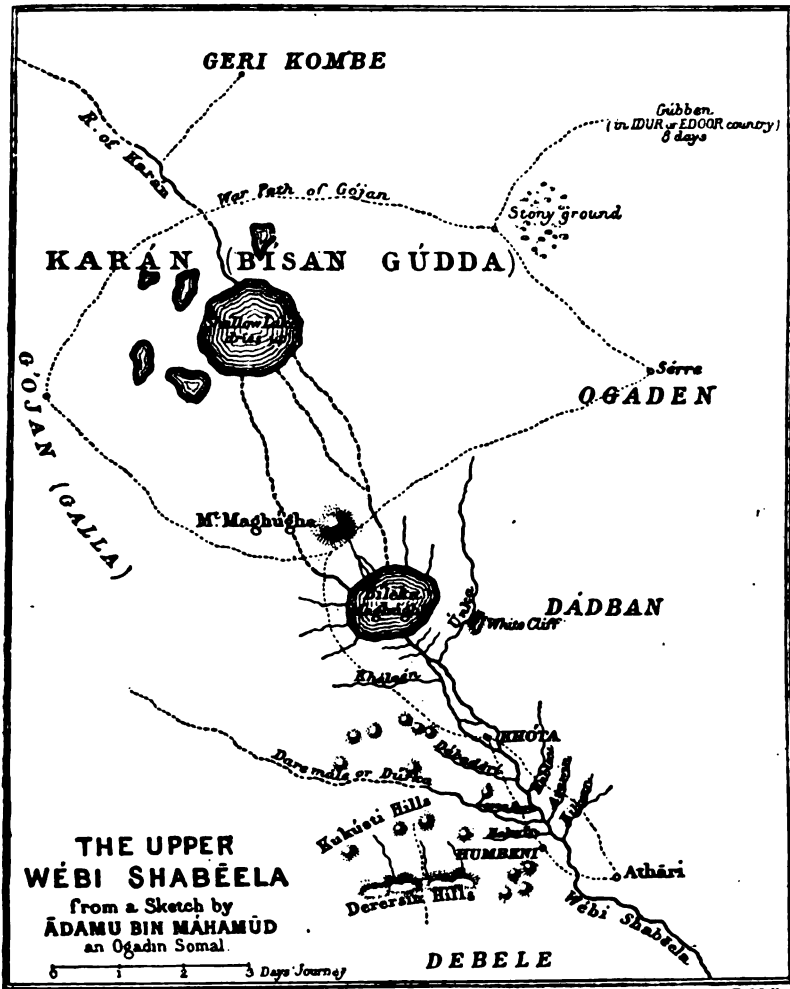
districts with which it deals. The country of the Hawiyah, which extends from Mokhdesho along the coast as far as Hópia, has hitherto been most inadequately delineated on our maps. Mr. Wakefield is the first to supply materials for indicating some of its more prominent features. It is to all appearance a country of white sands, producing scanty pasture, and affording only in a few localities a soil sufficiently rich for agricultural purposes, or for the growth of timber. Game is absent; lions or leopards are never seen; and even the hyena is very scarce. The principal tribes are the Abgal (including the royal clan of Al Yakub, the Wa Ézk, the Al Erli or "pot-bellies," the Arti (Herti), the Yusuf and the Galmaha, in the south-west; the Móro Sáthe in the centre, and the Ábr Githirr (Habr Gader) in the north-east. Hópia lies within the country of these latter. It is merely a small port, near which good water and timber are found. Amber is sometimes thrown up there on the coast. Sarūr, a locality in the interior, appears to be one of the more favoured spots, and the Abgal, who live there in small villages, cultivate millet, kunde, beans, water-melons, and cotton, and keep camels, cattle, sheep and goats, but neither horses nor asses. The home-grown cotton is spun by them, and woven into coarse tobas for the men, the women contenting themselves with goatskins. There are native smiths, but they are capable only of doing repairs. Tobacco, agricultural implements, and the calico in which the women wrap the head, are imported from Mokhdesho. These articles are very expensive, for a camel is given for nine or ten yards of tobacco, and a goat for a yard of blue cotton stuff. Slavery is said to be unknown among this tribe.

The Móro Sáthe, in the centre of the country, are the Murrusade of Guillain and the Emor Zaidi of old authors. They cultivate the same products as their neighbours. They likewise keep no horses. The Abgal, finally, are the tribe with whom Europeans come into contact at Mokhdesho.

The Wébi Shabéela or Haines River.—The Wébi Shabéela or Haines river, is apparently the only perennial river of the Somal country. There can be no doubt that some of its head-streams rise near the city of Harar, but we are unable to say whether the Waira, recently discovered by Chiarini, is one of its tributaries, or finds its way into the Jub. The accounts which Mr. Wakefield received as to its source are most conflicting, and quite irreconcilable with the topography of the country around Harar, such as it has been described to us by M. Taurin and other trustworthy European travellers. One of his informants, Adamu bin Máhamúd, an Ogáden Somal, has embodied his ideas in a map, of which we give a copy, as a curious specimen of native cartography. According to this native traveller, whom Mr. Wakefield describes as a man between fifty-five and sixty years of age, of mild disposition, and apparently intelligent, the river comes from a country called Karán by the Somal and Bisan Gudda ("much water") by the Galla. The western section of this region is a plain, flooded during four months of the year, and covered with pools imbedded in reddish soil during the remainder. The river of Karán, which flows through this country, has been traced for six days upwards. It is a swift stream, a stone's throw across when in flood, but dry during the greater part of the year. The eastern section of Karán is stony, with rugged rocks scattered over its surface. There are seven hollows, about 300 feet across, which during part of the year are filled with rain-water. The Gojan Galla live to the west of Karán, the Géri Kómbe or Kavlalala two days to the north-east of it, and the Ogaden Somal to the east. The path which leads from Sérre in Ogaden to the Gúbben Dóre in the Idur country passes between the eastern and western sections of Karán.

To the south-west of Karán the river, divided into two main branches, flows round a lofty conical mainland, riven by frightful chasms, and called Maghúgha. Beyond, it is once more gathered up in a lake, Bileka Maghúgha, nearly the whole

of which dries up in very hot seasons. There are fish in this lake, and vast flocks of birds resort to it, but neither crocodiles nor hippopotami are found. The river which leaves this lake is known as the Wébi Shabéela, or Wébi Athári, thus named after Athári (Adari), a large town, which is evidently Harar. It receives numerous tributaries, including the Únka, the swift Háblau or "clean river," the red-coloured Árawin or "much soil," and the Kiliwín or "big trench" from the east, and the



Kháloú or "crooked river," the Dábádéri or "long-tailed river," the Dúrka or Dáremála, and the Hábwín ("much débris") from the west. Of these rivers, the Dúrka ("from afar"), or Dáremála, thus named after a grass much relished by cattle, is the most important. It has been traced for a month without reaching the source, is up to 100 feet in depth, and 300 feet wide, and its bed cuts through the red surface soil into the white underlying rock. Its water is "red like blood."

Trees are floated down by it. Fish abound, but neither crocodiles nor hippopotami are found in it. The Dúrka forms a delta, the minor arm of which is known as Lama Bar, the "two palms." The Dúrka, notwithstanding its great size, dries up in very hot seasons, as does the Wébi Shabēla itself.

The Wébi Shabēla flows through the country of the Khóta and Humbēni Galla. The former are great agriculturists.* The millet which they grow attains the thickness of a man's arm. It takes ten months to ripen, and is then stored in granaries raised on poles. Both men and women work in the fields. A simple plough, drawn by camels or bullocks, is in use. Tobes of *lemale* cloth are worn by both sexes, and the women plait their hair, and allow the tresses to hang down.

The Humbēni are a numerous people. They have more goats than any other tribe, besides horses, asses, camels, cattle, and sheep. They do not till the soil, but purchase the corn they require from the Khóta or at Athāri (Harar), which is two days distant. The soil in their country is of a reddish hue, and grass grows luxuriantly. Their dwellings are circular, from five to ten yards in diameter, and provided with neither windows nor doors. The roof is almost flat, and although large quantities of straw are piled upon it, it leaks badly during the rainy season. The interior is divided into three compartments, of which the largest is assigned to strangers, and has stalls for horses in the corners, whilst the smaller compartments are the sleeping places of parents and children respectively. The Ogaḍēn are the enemies of the Humbēni, as of all other Galla, the Bworāna and Dádban † alone excepted.

Umari bin Daud, an Abgal Somal, states that the Wébi Shabēla rises in a lake which lies at the foot of a mountain in the country of the Arusía Galla. This mountain is visible from Athāri (Harar) and lies three to four days' journey to the west of Ēen. According to Umari, a traveller leaving Athāri for the south reaches the country of the Khóte on the first day, that of the Hūmbo (Humbēni?) on the second, and a camp of Bartira Galla on the third day. One day beyond the latter he arrives at Ēen, described as a considerable town of Somal, who live on friendly terms with their neighbours, the Arusía or Aróosi. One day further still he reaches a camp of the Arusía, near the Wébi Shabēla, and thence as far as Ime he travels through the territory of that tribe, always keeping by the side of the river.

Ime is a place of some importance, already known to us through d'Abbadie and Guillain. It is inhabited by freed slaves, who grow millet, wheat, and cotton, keep horses, cattle, sheep, and goats, and weave cotton cloth. They are black, with negro features. In time of danger they fly to the Górana or cliff of Ime, to the west of their settlements. This mass of rock is said to be a mile across and twice the height of the old castle at Mombasa. One day's journey below Ime is the district of the Káranle Somal, with several important settlements, where the river rolls between huge blocks of rock, leaving, however, a passage in the middle for a boat to pass through. A large river is said to enter the Wébi from the north-west, three hours to the north of Ime.

Six roads are said to converge upon Ime, viz. the Jiduēni or "big road" which leads in a north-easterly direction into the country of the Gelemies; the Habir road, which goes east into the country of the Ellam Somal, reputed for their piety and high moral standard; the Dedbāne or "road of the plain" which comes from Harar; a road from the same place which follows the Wébi Shabēla; and a much frequented path which conducts us to the country of the Aróosa.

Mr. Wakefield's informants are unanimous in asserting that the Wébi above

* *Kutto* means "ploughman" in Galla.

† *Dadbān* or *Dedbāne*, "dweller in plain."

Ime is a mere periodical river, which dries up in the hot season, and harbours neither crocodiles nor hippopotami.

Below Káranle the river is of considerable size throughout the year, but owing to the strength of its current it is not navigated for commercial purposes, and when it is in flood even the hippopotamus hunters of Ime, who are reputed for their daring, do not venture to launch their boats. The ferry-boats, which are found at most of the villages, are hauled over by a rope made of twisted creepers. The banks of the river are low, and the Somal, half-breeds, and freed slaves, who inhabit them, are thus able to irrigate their fields by means of canals. Wood is said to be plentiful, and as no rapids are said to exist, Mr. Wakefield suggests that it might be possible to ascend the river in a small steamer of sufficient horse-power. In its lower course the river is said to divide into several arms, inclosing large islands between them, and finally to lose itself in a lake, the size of which varies according to the season. The Somal call this lake Báyowin or "great water," the Tuni Bahrwēn, which means the same thing, the Galla (according to Krapf) Balli, or "pool." In the lower part of the river there are a few shallow places where boats can be punted across.

The road to Barāwa follows the right bank of the river as far as Shakāla, where it strikes off for the coast.

The more interesting districts on this part of the river are Shabēla or Shabelé ("leopard's"), apparently very populous, and inhabited by pagans, and Shidla ("stoneless"), which is inhabited by half-breeds, speaking Somal. They are also known as Jital Mogi, which means that they may "ignore the dry season," as they are able to irrigate their fields of millet, beans, sesamum, Indian corn, and cotton by means of canals derived from the river.

The inhabitants of this favoured region are Mahomedans, and they are reputed for their cruelty. They are armed with bows and arrows, and spears. They hunt the hippopotamus, and eat its flesh which pure Somal never do. They also fish with hook and line, and also use wicker-work traps similar to "crab-pots." Only a few goats are kept by them. Rághaile appears to be the principal town in the country.

The chief places on the lower Wébi are Géledi, the residence of Hámmed Yusuf, the chief of all the Sáb, which consists of three towns:—Géledi, El Ghóde, and Maréri; Golwēn; Anóele, the chief town of the Gonóu Somal; and Shakāle, where the road for Barāwa leaves the river.

The Galla to the West of the Upper Wébi.—Five great tribes of Galla appear to occupy the country to the west of the Wébi, besides some minor ones. The great tribes are the Ala, the Ánia, and the Aróosi, Arusi, or Arusia, in the north; the Gerire, in the centre to the west of Ime; and the Aróosa in the south, as far as the Jub, which separates them from the Bworana. The minor tribes mentioned by Mr. Wakefield are the Áltu, Gūre, Pánigal, and Jánti.

The so-called Dédbane road from Harar crosses the country of several of these. A few hours' journey from Harar brings us into the country of the Ala, who are called Debēle or "tail-wearers" by their Somal neighbours, and who have recently been visited by M. Taurin. Next to them dwell the Ánia, or Lóshu, as the Somal call them. A river Mun or Mádiale flows through their country, and the route follows it for a couple of days. It is a considerable river after rains, but nearly dries up in the hot season, and neither crocodiles or hippopotami are found in it. Several of the detached hills in the Ánia country are used as watch-towers, and fires are lit upon them on the approach of Ogaden from the east, Ala from the north-east, Dúda from the west, or Gurre from the south. The Ánia are a poor tribe apparently, for the men are content with a piece of cotton stuff thrown over the shoulders, whilst their women dress in goatskins.

The Áltu, who occupy a plain extending westward to the foot of lofty mountains, are said to be powerful, and rich in kine, asses, horses, camels, sheep, and goats. They cultivate a little wheat. The Gûre, to the south of them, are a mixture of Galla and Ogaden. They are a peaceable people. The Gáwele, who formerly lived around the Gúbben Dorl (see Itinerary) whence they were driven by the Idu Somal, are a purely pastoral people on the borders of Ogaden; beyond them live the Ré Ille, who are warlike, and cultivate the fan-palm, for the sake of the fruit it bears.

Of the powerful tribe of the Aróosi or Arusi, which extends northward to the Hawash and westward to the Zuway Lake, and occupies perhaps the region formerly known as Báli,* Mr. Wakefield tells us nothing, but he mentions the Pänigál and the Jánti, who live in the same region.

The Pänigál, called Páni by the Somal, live to the west of the Ré Ille and north of the Aróosa, who are their enemies. Their country is described as a plain covered with luxuriant grass, and intersected by a few rivulets, taking an easterly course. There are also some small lakes which never dry up. The climate is wet and cold, and rain is stated to fall every day (?). They are powerful, rich in cattle, horses, mules, asses, sheep, and goats, but without camels, as their country does not yield food suited to these animals. They are said to have been first among the Galla to embrace Islam, and the tomb of Sheikh Huseyn, their apostle, forms the principal object of interest in their country. Huseyn was a Somal from Harar, which he left for the avowed purpose of converting all Galla Land. The Debeli (Ala), whom he visited first, rejected his teaching; the Umbenbo (?), Ania, Alu, and Gáwele (?) declined to listen to him, whilst the Ré Ille, after having attended to his teachings for a time, soon fell back into their old paganism. It was only when he came among the Pänigál that he met with a more propitious soil, and he consequently settled among them, gathering disciples around him, and sending forth apostles to the neighbouring Bwórana, Gerire, and Aroosía. He translated the Koran, and that holy volume is now read to the Galla in their own language. But although one-half of the Pänigál are still heathen, the memory of Sheikh Huseyn is highly revered among all. Out of love for him Somal visitors are treated with unusual kindness, and when they leave the country they are given a mule or ivory. As a result of these friendly relations many Somal have settled down among the Pänigál, whose language and customs they have adopted. Sheikh Huseyn's tomb is guarded with much care. The saint lies buried beneath a sarcophagus made of rudely shaped slabs of stone about 6 feet in length and 4½ feet in height. A circular hut, about 50 feet in diameter, has been built over the sarcophagus. Its side walls, about 30 inches in height, are made of posts and stone, its roof is thatched. Women and children are forbidden to enter this hut, but they, as well as strangers, are permitted to seek shelter under a covered arcade which surrounds it, and where cattle are slaughtered for sacrificial purposes. A Somal and a Galla are attached to this tomb as teachers, and they conduct worship in their national languages.

The Jánti appear to be neighbours of the Pänigál. Their country is a wide plain of black soil, luxuriantly covered with grass. There are no forests, not even around the few lakelets or ponds, which are met one or two days' marches apart. The climate is cold, and more rain falls than in the Páni country. The central district is liable to hailstorms during the southern monsoon. Although they are not equal in numbers to the Páni, the Jánti are nevertheless an influential tribe, rich in horses, mules, asses, small cattle with long horns, goats, and sheep. Camels are scarce; a little millet is grown. Men not entitled to wear the *gutu* or crinal badge,

* Báli (8° 50' N., 39° 40' E.) is a district in Southern Shoa recently occupied as a missionary station, Gamu.

shave the head completely. Women allow their hair to grow, and anoint it liberally with ghee, but do not plait it into tresses. Their garment is made of two goat-skins, sewn together.

The *Aróósa*, who live to the north of the Jub, which separates them from the Bworana, are quite distinct from the *Aróósi*, *Arusi*, or *Aroosáa* on the north, from whom they are separated by the Gerire. They are said to be the mother tribe of all the Galla, and are split up into numerous clans, including the *Káko*, *Kariyu*, *Surhi*, *Lúgho Báddan*, and *Uriya*, and are second only to the Bworana in strength and numbers.* Wheat, Indian corn, and millet are cultivated, but pastoral pursuits predominate. Camels, kine, and sheep abound, as do horses, asses, and mules. The *Aróósa* are skilful riders, and can pick up a spear from the ground whilst in full career. In war they dodge the spears of their enemies by hanging down the off-side of the horse. They hunt on horseback, and when fortunate enough to kill a lion, zebra, or giraffe, they hang the mane of the slain beast as a trophy round their horse's neck. If an elephant is killed the tail is suspended to a lofty tree near a frequented road, to proclaim the hunter's prowess. No coffee is found in the country, and the little that is used is procured in Konso or at Ime. Among the products which the *Aróósa* take to Ime are salt, myrrh, and the bark of a tree, called *úumsi* by the Somal, and *khay ya talfata* by the Galla, and even more highly valued than myrrh.

The Country of the Sáb or Rahanwin.—The *Sáb*, or *Rahanwin*, according to Mr. Wakefield's informants, include the *Túni*, the *Jidu*, the *Erlai*, the *Digili*, the *Gebrun*, &c. *Umari bin Daud*, himself a Somal, declares that they are not Somal, whilst *Kinzelbach* (von der Decken, ii. p. 320) describes them as the descendants of Somal fathers and slave mothers. They are evidently much mixed with Galla, who formerly occupied a portion, at all events, of this country.

On going from *Mokhdesho* or *Baráwa* to *Bardéra* or *Lógh* on the Jub, the country of these tribes has to be crossed, and to the itineraries previously furnished by *Guillain* and *Cruttenden* Mr. Wakefield adds at least one that is new (No. 6), and according to which the journey from *Mokhdesho* to *Lógh*, a distance of 190 geographical miles, occupies ten days.

Crossing the *Wébi* at *Géledi*, the traveller passes over the *Gelgél*, a grassy plain, and through *Dáfet*, reaching the *Bur*, a "hill country," on the third day.

The "Bur" is commercially of some importance, for its inhabitants, the *Erlai*, visit the towns on the coast, where they part with their camels, cattle, and other products for dollars, which they in turn invest in indigo-dyed calico, iron, tobacco, and zinc (for bracelets). They are rich in camels, cattle, asses, sheep, and goats, but have no horses. Red millet, beans, vetches, sesamum, and a little cotton are grown. Prominent among the hills in this region is the *Bur Héba*, very lofty, and wooded to its cloud-capped summit, which it takes twelve hours to reach. A spring rising near the top is held in high veneration by the Somal, who make pilgrimages to it, spending as many as ten or even forty days fasting in a neighbouring cavern or stone hut, until their prayers are responded to by "an audible voice from an invisible presence." Near the same mountain live the descendants of the Galla *Sheikh Múhmin*, who were spared when the Somal invaded the country, on account of the protection extended to the *Sheikh* by a mysterious bird, after whom he is named. *Bur Déjji*, the "snake mountain," about six hours from

* Elsewhere the *Lúgho Bádda* are stated to live far to the north-west of the *Aróósa*, against whom they were led in times long past by *Hájje Dádaicha*. On that occasion they suffered such severe losses that they have not returned since.

Héba, is thus named after two "petrified snakes," who guard its approach. Umari says that these "snakes" require to be pointed out to strangers, before they can be recognised as such. This mountain, likewise, is described as lofty and wooded. Lions, leopards, hyenas, and antelopes abound near it.

Móala Mád, beyond the "Bur," is described as a town of Erlai, about half the size of Mombasa, and with several mosques within its walls. Sáramán, a day beyond it, is a fertile district inhabited by Ashráf or descendants of the Prophet, who are rich in cattle, camels, sheep, and goats, and till the soil.

The Bón, who occupy a portion of the Sáb country, at the back of the lower Wébi, but who are also found in the Bworána country and further to the south, are known also as Bón waranli ("Bón with spears") or Bón gavawín ("Bón with big quivers"). The Bworána call them Idóle or Kocho, and Mr. Wakefield suggests that they are identical with the Wata and Wasania (Walangula), who live under similar conditions among the Barareta Galla. Dr. Fischer looks upon the Wátus or Wadahalo, and more especially upon the Wasania, as near kinsmen of the Galla. They certainly speak Galla. Physically they are well made. Those among them who live in the Sáb country are hunters, who pursue the elephant and rhinoceros with packs of hounds, and kill their quarry by dexterously plunging a long spear from behind into its abdomen. The Bón keep cattle, but they subsist almost exclusively upon the products of the chase.

The Jub.—The voluminous information collected by Mr. Wakefield does not settle the question of the sources of the Jub, although it points to the Gibbe as its head-stream. This conclusion would agree with the opinion held by the early Portuguese, by Léon des Avanchers, Massaja, and Cecchi, although in conflict with the information collected by M. d'Abbadie and Dr. Beke, which would lead us to look upon the Gibbe as the head-stream of the Sobat.

Mr. Wakefield traces the Jub from Konso, to the south of Kaffa, to Lógh and Bardéra. Below Konso it is known as Wébi Dáwe or Dau, or Ganale Gurácha ("black river"), although its water is said to be red; or Wébi Dúrka ("river coming from afar"). Does Dáwe mean "capricious"? Below Lógh its name appears to be Wébi Ganáni, or Wébi Giwéni ("big river"), Jub being the name given to it by the Arabs.

Lógh, or Lógho, appears to be the largest town on the Jub, which surrounds it on three sides, the neck of the peninsula thus formed being closed by a stone wall. It is much larger than Bardéra, and a great place of trade, to which the Bworána bring ivory, coffee, nitrate of soda, and *manukato*, a scented wood, which they exchange for copper, iron, cloth, &c., brought thither from Baráwa. The inhabitants are Gasára Gúde Somal, who formerly lived at Mokhdesho. The plain around the town has red soil, and is well cultivated. There can hardly be a doubt that Lógh is identical with the Ganana of our maps. Mr. Wakefield was told, however, that Ganáni, and not Ganana, was a wooded district to the west of Lógh. Athále and Kúrnum are smaller towns above Lógh.

Below Lógh the Jub forms the rapids at the foot of which the *Welf* was wrecked in 1855. These rapids are called Le Héle, and it is interesting to learn that the two boats taken from Baron von der Decken are now employed as ferry-boats at Bardéra, the Galla name of which is Bal Tir.

Below Bardéra the Jub appears to receive a considerable tributary from the west, viz. the Gálana Salálu, which Woréde Gálagálót actually identifies with the Jub, a supposition, however, quite irreconcilable with the itineraries which he furnishes (Nos. 7 and 8).

There remains to be noticed in connection with the Jub the country of Wama, which is delineated in the Society's map of Eastern Equatorial Africa in accordance

with a sketch made by the Woréde just mentioned. It abounds in lakes, all apparently fed from the Jub. The Déshek R'ia Gháta and the Déshek Wama only of these lakes never dry up, although the creeks which feed them do. The former of these lakes is four days round, and has a fringe of forest, in which *dadech* trees are most conspicuous. The soil of this country is dark, and covered with luxuriant pasture; but it is avoided by the Somal owing to the presence of the *géndi* fly, which is even more destructive of camels than of cattle.

Formerly the country was in the possession of the Kobába (Kokaba), Wajóle or Bararéttá Galla, known to the Somal as Worra Dai (Wardai), but they were ousted about 1860 by the Kavlallata or Kablata Somal, and Wama appears since then to have become a "no man's land," only occasionally frequented by Tuni and Erlai, Bwórana, and Kablala.*

Among interesting localities in the Wama country should be the ruins of Kéethi or Kéyrtiie, a town two or three days' journey from the coast. It had stone houses and seven gates, but was abandoned owing to the quarrels between the Kilio and Garra families. Its inhabitants settled at various places along the coast, and became known as Wabúnaya, or "robbers."

The Bworana Galla.—The Bworana or Borani Gallas have been known by name to Europeans since the days of Lobo, but although M. Léon des Avanchers collected some more precise information respecting their country, it is only through the inquiries conducted by Mr. Wakefield that our map has been filled up with an abundant nomenclature. The Bworana are undoubtedly one of the most powerful of all the tribes of Galla. Their country extends from the vicinity of the Lower Jub for a distance of 500 miles as far as Konso, a district to the south of Kaffa, believed to be the same as Kuisha. Kónso, according to Mr. Wakefield's informant, is inhabited by half-breed Gallas, who excel as agriculturists no less than as weavers of cotton cloth, the products of their looms being exported to great distances. Their country lies between the Wébi Dáu and the Wébi Kóre, or Masai river, both of which they have tapped to irrigate their fields.

In the west the Bworana boundary is formed by a grassy plain or upland, known as the Sera or Serto, that is, "forbidden" land. Their neighbours here appear to be various tribes of negroes, perhaps kinsmen of the Shiluk or Bergo, who are known to extend from the Bahr-el-Abiad southward as far as Kavirondo, on the eastern shore of the Victoria Nyanza, as well as the Rendile or Kore addi ("White Masai," as distinguished from the Kore meth, or "Black Masai"), on the shores of the Lake of Sambúru, which no European has as yet beheld. Their country, or at all events one of the principal sections of it, is known as Lávin, which Mr. Wakefield under-

* The Kablala include the Kombe and Kumade. In 1869 they joined the Marehan, Dir, and Erlai (Sáb) in a predatory excursion into the Worra Dai (Bararetta) country, from which they returned home rich in cattle and female captives. The Kablala, during the homeward journey, robbed the Erlai of their share of the plunder. About 1873 the Erlai started with 7770 men to avenge this injury: in the Wama country they fell upon 500 Kablala, and killed 300 of them; flushed with victory they started in pursuit, but, when crossing the forest beyond Dérep, they fell into an ambush, and were completely routed.

As to the Bararetta, or Wardai, they are said to be the descendants of Arusi and Baretüm, who left their country on account of the privileges claimed by the elder brothers. They first settled in Hámbábála Jidat, a district in the southern Burrána country, and subsequently moved to the country to the south of Tana, at that time inhabited by the Limádo. The Bararetta have had twenty-five chiefs since, each of whom ruled during eight years, so that this migration must have taken place about two hundred years ago.

stands to mean "profitable" place, and which Somal and Arabs refer to as Ard or Did el Liwen.

The information which Mr. Wakefield was able to collect respecting this vast region of some 75,000 square miles is copious, but it is not sufficiently precise to enable us to lay it down with confidence on a map. He gives, indeed, what professes to be an itinerary from Lógh to Konso, but as a journey by that route is supposed to occupy no less than 210 days, being at the rate of hardly more than a mile a day, it is quite evident that we have to deal with virtually disjointed materials, which take us by more or less erratic tracks into all parts of this vast country. In utilising these materials for the Society's map I have therefore been compelled to dismember this apparently continuous route, and to distribute its constituent links by such lights as are afforded by Mr. Wakefield's notes and sketch maps, and by the information previously collected by M. Léon des Avanchers.

I need not give here a long string of native names, as the whole of the information will be found embodied in the Society's map. This much appears to result from an examination of these materials, that we have to deal here with a vast pastoral region, dotted over with detached hills and lofty mountains, but apparently devoid of all mountain ranges. No indication whatever of an edge of a lofty plateau, such as is supposed to extend southward from Abyssinia to the region of the Kenia and Kilimanjaro, is afforded. None of the rivers, with the exception of the Galana Salalu, which one informant, erroneously I believe, identifies with the Jub, appears to be perennial. They rush along with an impetuous torrent after heavy rains, but soon exhaust their strength, and are mere wadis during the greater part of the year. Trees are plentiful, and one of the districts—Yáka jito—is renowned for its gigantic baobabs. There are even forests, to which the Galla fly with their herds when pressed by their enemies, and evidence as to tracts capable of cultivation is not wanting. The coffee-tree grows wild in many parts of the country, but is not cultivated. Game of all kinds abounds; iron and zinc are found. Some idea of the nature of the soil may be formed from the descriptive terms of "white," "red," and "black" applied to it, which evidently refer to limestones or chalk, red loam, and volcanic rocks. Nitrate of soda is found in the pits of El Mágad. It is exported to the coast, where the Somal take it with water as an aperient, or mix it with their snuff. A "nish" or hatful may be bought at Barawa for a dollar.

Several routes lead from the east coast into the Bworana country. One of these leads from Mokhdesho to Lógh on the Jub; another starts from Barawa, and leads to the same place, or to Bardera; whilst a third route follows the river Jub itself. These routes have already been considered, but there is a fourth route starting from Kisimáyu, which appears to present greater advantages to intending explorers, for whilst the northern routes lead through the country of the Rahanwín or Sáb, who are averse to seeing their trade monopoly interfered with, as evidenced only recently by their refusal to allow M. Révoil to traverse their country, the southern route leads almost directly into the Bworana country.

Kisimáyu is a Somal town, ten miles to the south of the Jub, built in the Swahili style and occupied by a small garrison of Zanzibaris, whose quarters are inclosed in a stockade. Wells of brackish water yield an abundant supply, but drinking-water is generally brought on the backs of oxen or donkeys from the Jub. The town is visited in times of peace by Bworana caravans, and even by traders from Samburu, who bring camels, asses, hides, ivory, coffee-berries, *magadi*, which they exchange at the shops of Arab and Banyan traders for such articles as they may require.

From Kisimáyu to El Wak in the Bworana country is a journey of six days of ten hours each. The road leads during the first day over a dark plain only frequented by the Somal herdsmen during the rains to Andaráfo. Five hours beyond that

place the Fára Wámo is crossed. This is a stream which leaves the Jub at Koferta, near Hindi. It reaches up to the loins when flooded, but is usually dry. On the evening of the second day the caravans arrive at Tápsau Wáma, another locality only frequented during the cool season. The third station is at Dérep, and leads over a plain dotted with pits which fill after rain. Beyond Dérep a dense forest, abounding in elephants, rhinoceros, and buffaloes has to be traversed, after which the traveller emerges upon an open red sandstone plain, with a few clumps of trees, in the centre of which lie the famous El Wak or "God's Wells," which supply an abundance of most excellent water throughout the year; and a Galla proverb says that "only rivers, rain, and El Wak furnish real water, and that all other waters are deceptions." Most of these wells occupy natural pits, but others have been excavated. They are very deep, and the Galla descend into them by means of the notched trunks of trees, the lowest man filling his giraffe-skin, which is then pitched up from man to man, until it reaches the surface. From El Wak, Muk Būna or Bunāt, the place of residence of the Bworana chief Hughashambalu, may be reached in a few days.

The Bworana are split up into two great sections, viz. the Yā and the Yūl (Yūb?), of whom the former are purely pastoral, and occupy with their herds of horses, cattle, camels, asses, goats, and sheep, the region towards the north-west, whilst the Yūl, though likewise rich in cattle, cultivate also millet, spices, and *dawa* (a medicinal herb). In addition to these two subdivisions, Mr. Wakefield incidentally mentions the Biltu, and states that the Bararetta in the south also claim kinship with the Bworana. The chief of all, Góbaharsamé, resides in a district renowned for its beauty and fertility, within which rise the hills Būna and Bétela, the latter being about two days' journey to the south of the Jub.

The Bworana, according to all accounts, are a warlike and turbulent tribe, and the Masai cannot stand against them, although the Somal, their nearer kinsmen, appear to have occasionally worsted them in the encounters which they had with them. They are famed as horsemen, riding their steeds with a wooden saddle and stirrups made of a thong, with an iron loop large enough for the insertion of the big toe as a stirrup, and an iron bit and bridle. Great care is taken of the horses, and mares of good breeds are carefully looked after. Milk and ghee are given to the horses as the most nutritious food, and they are washed and greased over with ghee to give them strength. During the heat of the day they are kept in stables built of stone, thatched with grass, and provided with iron-bound doors, which are forged by the Bworāna smiths, for the horses are so spirited that no wooden door would resist them. Twice daily they are taken out for exercise, viz. early in the morning and again in the afternoon, and four times daily a bell of brass or copper of native workmanship is sounded in each camp or settlement, as a sign for the people to turn out to gather grass for the horses. When horses are employed in hunting, a cord is wound round their ears so as to make them deaf. The huntsmen are armed with spears, swords, and bows, and they pursue the elephant and rhinoceros with the sword in the same manner as described by Sir Samuel Baker in his 'Nile Tributaries of Abyssinia.'

War appears almost a daily occupation of the Bworāna. Their arms consist of a javelin, of a spear, and a shield. Warriors who have slain their man are permitted to wear an ostrich feather stuck in the back of their head, as also a parti-coloured turban. All start on horseback, but as each "army" is accompanied by a commissariat train of cattle, it marches but slowly. On reaching the place it is intended to attack, the men dismount, tie their chargers up to a tree, and advance on foot. There is no order of battle or tactical formation, each man acting as he deems best. If the enemy's village is taken by surprise, it is set on fire, all the men are killed, but the women and children are spared, to be carried away as slaves. The enemies

are mutilated, but whilst young warriors preserve and take home the spoils of their cruel deeds in proof of their achievements, old "braves" bury their trophies in the enemy's country. Waichu, one of Mr. Wakefield's informants, rejected with indignation the suggestion that his countrymen cut off the hands of women, to secure the brass rings they wore—a deed worthy only of Masai. No quarter is given or expected. If the attacking party meets with a repulse, the horses afford it a ready means of retreating, and pursuit is checked by occasionally wheeling round.

The cattle taken on these plundering expeditions is first of all collected within an "inclosure" such as that marked Lafa Danába, or "plain of booty," on our map. Here the booty is divided, the largest share falling to the Aba Dáláti or general in command, and after each man has marked the beasts assigned to him, the whole herd is driven home to the village of the raiders. Slaves, it is stated, are treated kindly. The Galla do not marry the slaves they make among the Rendile, but occasionally condescend to make them concubines, and sometimes part with them to a Somal friend.

Great rejoicings take place on the return home of a band of raiders. On approaching the village the stolen cattle are sent forward. The warriors linger behind, until their shouts of victory bring out the women, who collect around them dancing and clapping hands, and uttering the shrill cry of delight peculiar to Africa. Not a word is said about the slain and missing as the crowd proceed to the settlement. Mothers or wives, anxiously inquiring for a son or husband, are told that the dear one still lingers behind. On entering the village, the women bring forth *sororos* with a mixture of milk and ghee and with it anoint the head* and other parts of the body of the warriors who have killed a foe, and also mark their faces with streaks, one black, down the forehead, two white on the left cheek, and one in blood on the right cheek. This ceremony performed, the women's triumphant shouts give place to the songs of the warriors, in the course of which the names of those who have fallen are introduced with a great deal of delicacy. Each of these mournful announcements is preceded by a low monotone, to which the women respond, and when the name of the fallen one is mentioned, the members of his family fall down with great weeping, and are deaf to all praise. This duty to the dead performed, the deeds of the survivors are extolled, and the trophies brought home by the young warriors are then publicly buried in a hole dug outside the settlement.

The religion of the Bworāna, as of the other Galla who have not come into contact with other tribes, is a pure and simple theism, and no better idea of their religious notions can be obtained than that given by the prayers appended to Tutschek's Galla grammar. They believe in a supreme being, Wáke; in a future state, and in the efficiency of prayer and sacrifices, but have no priests. Fine trees forming landmarks in the savannahs or plains are favourite places at which to meet for prayer and sacrifice. One of the most famous localities of this kind is in Láfán Dánsa or "the beautiful country," where a Galla saint, distinguished for his upright life and love of God, lies buried at the foot of a tree. Two rings formed of shrubs surround the tomb, the outer ring being open to all, whilst the inner one is reserved for the elders of the tribe, who there offer up prayers and sacrifices. Warriors when they depart hence take up a little sand from the foot of the tree to take to their wife for "good luck." Another of these meeting-places is in Lafá dīmtu, the "red land," where sacrifices are brought on the election of a chief.

Even more interesting is the rocky plain called D'ad'áp ("dream"), on the

* Tutschek tells us in his vocabulary that the warriors wear a crown of thorns on these occasions, to prevent the ghee from running down the face.

frontier between the Bworāna and Arósi, where three black stones have been raised by the Galla, and which are annually visited by them, when cattle are sacrificed and prayers offered to Wake.

Of more frequent occurrence are the sacrifices brought every spring and autumn in each village, when the headman calls together his people, and sacrifices a black goat, as being an animal most acceptable to the deity. The animal's head is wrapped up in a new cloth of indigo-dyed calico, and whilst offering up prayers the headman stands by its side and gently strokes its back with his right hand, whilst holding its head with the left. Black cattle and goats are apparently sacred animals, and are seldom used for ordinary purposes. During the ceremony the sprig of a tree is dipped in water, and the people present are sprinkled with it. We may observe here that in Gura, a country under a Bworāna chief, snakes are held sacred.

A curious ceremony takes place when a Bworāna lad attains his majority; it is called *ada* (forehead), but Mr. Wakefield adds in brackets the word *java*, which means "circumcision." On these occasions the young men on behalf of whom the ceremony takes place assemble with their parents and elder relatives in a hut or *goma* built for the purpose. A bullock is there sacrificed, and every person present dips a finger into the blood, which is allowed to flow over the ground, and whilst the men touch the forehead with the blood-stained finger, the women similarly touch the windpipe. These latter, moreover, smear themselves with fat taken from near the kidney of the animal sacrificed, and throw a narrow strip of its hide round the neck, wearing it until the following day. The bullock is then devoured, the men accompanying their meal with potations of *dadi* or hydromel, and all present joining in the chorus of "Woh! mála sa vai!"

In addition to Bön, locally known as Kócho or Idóle, a good many Somal appear to have settled in the country of the Bworāna. These immigrants after a while give up the Korán, and become merged in the Galla. To this class probably belong the Garra, or Gáre Somal, for *gáre*, in Galla, means "bastard."

In conclusion, we give the principal itineraries collected by Mr. Wakefield.

ITINERARIES.

All distances in hours (generally including the midday halt) unless otherwise stated.

1. *Mokhdesho to Hópia (by Umarí)*.—1. Harshanshále well. 2. Warshekh (Aval, an Abgal town, half-way). 3. El Harár, "bitter well." 4. Beshághale wells. 5. Askúle (Maróti of Arabs). 6. Oromagáli, three wells. 7. Zihíl, many wells (El Athale, a fishing village, half-way). 8. Camp. 9. Meghét, wells. 10. El Géul, brackish water. 11. El Dèble, wells. 12. Héndanāne or Séfa kái, wells. 13. El Marék, wells. 14. El Mad'háhawēne, wells. 15. El Maérawákho, wells. 16. B'ád Ulgáras, three hours from sea, a small lake here. 17. Símimehiya, wells (Ayán Same, 1 to 1½ days inland). 18. El Garab Ádde, wells. 19. Wháhawin, wells (Dudúble, 1 day inland). 20. Darút, brackish wells. 21. El Gan, wells. 22. El Hendúle, brackish wells. 23. El Bakélli, brackish wells. 24. Camp, no water. 25. Kósultira, brackish wells. 26. Fádi Gólol, good water. 27. Camp, no water. 28. Hópia or Hawpia.

2. *Hópia to Raǵhaile and Mokhdesho (by Umarí)*.—1. Dága Gáu, wells, 12 S.S.W.; Maga Jíwwe, wells, 36 S.S.W.; Kalsubáno, wells, 12 S.S.W.; Mirón, 5 S.S.W.; Hára Dera, district of Abgáli, 12 S.S.W.; Sarúr, 12 S.W.; Lebba Dáwib in Sarúr, 12 S.W.; Dudúbla, 12 S.W.; Ayan Sáme, 12 S.W.; Abara Eene, no water, 12 S.W.; Tura Fíli, 12 S.W.; Áli Eivaka Gab, 12 S.W.; El Aul, good water, 12 S.W.; Dába Léir or Léyeer, no water, 12 S.W.; El Gét Ráran, 12 S.W.; El Wh, 12 S.W.; Fei Shúga, good water, 12 S.W.; Damba Athat or Q'atha, wells, 12 S.W.; Ráǵhaile on the Webbe Shabéela, 36 S.W.; (see Itinerary No. 4); Dága Heó, first village in Shidla, 12 S. by E.; Tugúri, 12 S. by E.; Yághele, 12 S. by E.; Fár Báraki, 12 S. by E.; Démele, 12 S. by E.; Korébe, last village in Shidla, 12 S. by E.; Bálat, Abgal village, leave the Wébi, 12 S. by E.; Jábal Isakh, 6 S.E. by S.; Arít, 5 S.; Mokhdesho, 4 S.

3. *Berbera to Gúbben Dorl (by Adamu).*—Magála Sähil (Berbera) to Chábaät (“white stick”) 2 days S.E.; Jífele, 2 days S.E.; Fámbe, 6 hours S.E.; Dek in Berrin wën, the “big country,” 1½ days S.E.; Lam Hágal, a tree, 3 days S.E.; Chirínle (name of a tree), 1½ days E.S.E.; Fúrda Láis (“horses die”), 2 days S.S.W.; Láveán a Mawéithu or Lévo Ána Mawéithu, 1½ days S.; Gúbben Dorl, 1 day S.E.

4. *Berbera to Baráwa (by Umari).*—Magála Sähil (Berbera) to Athári (Harar) 60 S.W. by S.; Khötégalla, 12 S.W. by W.; Húmbo Galla, 12 S.W. by W.; camp of Bartíra Galla, S.W. by W.; Een, Somal town, 12 S.W. by W.; camp of Arusía, near Wébi Shabéela, 12 S.W. by W.; last camp of Arusía on river, 72 S.; Ime, 12 S.; Karanle, 12 S.; Bayaháu, 1 S.; Shabéla, 36 S.; Masúr, town, 60 S.; *Raghaile*, 12 S.; D’hagahéra, freed slaves, 12 S.; Saráman, freed slaves, 12 S.; Yághale, Mwobilen, 12 S.; Far Báraki, Abgal village on E. bank, 12 S.S.E.; Demele, Abgal and Mwobilen, 12 S.S.W.; Korébe, or Koréva, Abgal, 12 S.; Bálat, ruins, village, 12 S.; Géledi, town, 12 S.E.; Mordíli, town of Intírro Somal, 10 S.S.W.; D’hāanyēre, town of Garre Somal, 12 S.; Audégle, town of Bégedi, 6 S.S.W.; Mambáarak, town of Bégedi, 9 S.; Wāagādi, town of Biamáli, 5 S. by W.; *Golwēn*, 5 S.; Adēhmo, village of Jidu, 11 S.; Darshēn, village of Jidu, 9 S.; Shakála, village of Jidu, where the Wébi is crossed, 11 S. by W.; Baráwa, 12 S.S.W.

5. *Athári (Harar) to Ime (by Adamu).*—Athári to camp of Debéle Galla, 6 hours W.; Ánia or Lótha, 6½ days W.; Áltu, 10 hours S.W.; Gúre, 13 hours S.; Gáweli, 3 days S.W.; Ré Illi, 2 days S.W. by W.; Gorana Ime, 5 hours S.

6. *Mokhdesho to Lógho on the Jub (by Umari).*—Mokhdesho to Géledi, 12; Gelgel, 12; Dáfet, 12; Bur Héba, 24; Mōala M’ad, 12; Saramān, 12; Lógho, 30.

7. *Bardēra to Derégomale (by Worēde Gálagalót).*—Bardēra to Gára Liván, 10 W.N.W.; camp of Arúsi, 12 N.; camp, 37 W.S.W.; Salálu (Júb), 10 S. and W.S.W.; along north bank of Salálu to Derégomale, 3.

8. *Derégomale to Baráwa (by Worēde Gálagalót).*—Derégomale to camp, 15 E.; Gára Liván, Bardēra, cross Jub, 15; Mátha Góí, 9; Aanóle, 13; Marēre, 17; D’hámere, 2; Baráwa, 7 E.

9. *Baráwa to Wāma (by Worēde Gálagalót).*—Baráwa to Aarshánle, 5 S.W.; Māgo, 5 S.W.; Gáraswín, 9 S.W.; Chírfa Góda, on Gāmi lake, 14 S.W.; Tuküle, 13 S.W.; Aji Dóiyó on the Webbi Gauāni (Jub), 6 S.W.; cross and go on to Rē Ghata in Wāma, 9 W.

10. *Kismaiyo to Lógh (by Umari).*—Kismaiyo to River Jub, 5; village on ferry over Jub, 2; Hindi, 4; Haf, 2; Jiwé, 1½; Malaéle, 1; Senjibár, 5; Láma Dát, 12; Géila or Géyeela, 12; Áima village, 12; Juāni (Juári?), 11; Bardēra, 11; Lógh, 18.

11. *Kismaiyo to El Wak (by Umari).*—Kismaiyo to Andaráfo, 12; Tápeau Wāma, 12; Dérep, 12; El Wak, 36. Direction, N.W. by N.

12. *Supposed Itinerary through the Bworāna Country (by Adamu).*—Lógh to Būr Guthut, 1½ days N.N.W.; Mduíllo, 1 day N.N.W.; Dékrébē, 3½ days N.N.W.; Marra, 1 day N.N.W.; Garo village, 1 day W.N.W.; Bur Gábo, 1 day W.N.W.; River Kontoma, 3 days S.W.; Góbo, 4 days W.S.W.; Bwōla Gudagu, 2 days W.N.W.; Harra Gúthut, 7 days W. by N.; Darmo, 5 days W.; Būna Yerra, 2 days W.N.W.; Būna Betela, 2 days W.; Omaro, eastern border, 4 days W.; Omaro, western border, 6 days W. by S.; El Magad, 8 days W.; Athable, 4 days W.S.W.; Korma Harre, 7½ days W. and W. by S.; Akafede, 2 days N.W.; Jilo, 4 days W.; Bur Mandera, 10 days N.W. and W.; El Garsa, 4 days W.; El Kocho, 9 days W. by S.; Muka Bun, east end, 2 days W. by S.; ditto, western bank, 4 days W.; Lafa Righ, 4 days W.; El Hagarsu, 4 days W.; Yáka Jilo, 5 or 6 days W.; Danába (?), N.W. (6 days N.E. by N. of the Bendile); Gabba, 6 days N.W.; Livinwēn, 4 days W.N.W. (40 days E. of Lógh); Kaya Liban, 24 days W.N.W. (or 7 days E. of Samburu, and S.W. of Ime); Bur Waicho, 7 days W.; Intille, 10 days W.; Dokota, 18 days W.; lake in Konso, 20 days W. Total, about 210 days’ journey.

The PRESIDENT, in commenting on Mr. Ravenstein’s paper, said it was not that of a traveller, but of a man who threw himself so heartily into the labours of others that he seemed to travel with every traveller whose works he described. It was

interesting to hear him giving the credit which was justly due to the Portuguese, who at present were not in very good odour with the British merchant. Among others he mentioned that early missionary Lopez, whose works Dr. Johnson translated in the period of his youth and great trials. Since then that unknown country had awakened the adventurous spirit of almost all the great nations of the world. Portuguese, English, French, Dutch, Germans, had all contributed their quota, and the last and one of the most successful travellers there was Mr. Wakefield, to whom the Society was indebted for many interesting communications. Mr. Ravenstein had clearly shown how much still remained to be discovered, and had thereby increased the interest taken in that part of Africa.

*Boat Voyage along the western shores of Victoria Nyanza, from
Uganda to Kageye; and Exploration of Jordans Nullah.*

By A. M. MACKAY, C.E.

WE are indebted to the Church Missionary Society for the following account of a recent voyage along the western shores of Victoria Nyanza and exploration of Jordans Nullah, which they have received from their agent, Mr. Mackay.

THE BOAT VOYAGE.

June 27, 1883, I left the mission station at Natele, in Bu-ganda (Uganda); slept for the night at Kyikibezzi, only 10 miles distant and near Murchison Bay.

June 28.—Marched another good dozen miles to the plantation of Sebagoya (in Sebukule's country) near Naambwa Hill.

June 29.—Reached Mugula's capital, Ntebe, after some eight miles' march.

June 30.—Got men and loads distributed among the canoes, and embarked in fair weather. After a long pull reached Bunjako, at a point near Salè Island, late in the day.

July 1.—We were late in starting. The lake was rough and the weather very hazy, but it became smoother as we got under lee of Sesè. Put in for dinner at my old camp in Sesè, among wild palm-trees. Re-embarking at 4 p.m. we paddled till after dark, hoping to reach Bujaju, but put into a cove in a small lumpy island between Sesè and mainland, and found here Sungura's boat at anchor, *en route* for Usukuma. The crew were in huts ashore; they have a cargo of ivory and slaves in stocks. This sailing boat has been eight days from Ntebe to this, while we have covered the distance in two. We cut bush-wood to clear a place for our tent which we pitched by the light of my lantern. The outer awning of my tent I rig up separately for my men to sleep under, as it is cold.

July 2.—At dawn it blew a cold north wind, and the dhow took advantage of it by hoisting sail and getting under way. My tent was alive with biting brown ants, which only fire and hot ashes will drive away. We embarked at length, intending to make for the opposite shore of Bujaju, where we must buy some earthen pots for cooking. Wind unfavourable, so we strike south, while the dhow held on her way to Dumo. By 3 p.m. it got rough. We soon after landed on an open beach near Mbroyaga, the country seat of Mungobya, who has just returned from a war in Karagwe, whither he was sent with an army, to put a certain grandson of Rumanyika's on the throne, and plunder some other claimant; he had returned with large booty of cattle, women, and slaves, as is the custom in Bu-ganda.

Soon after encamping I set off with some men to see the "general," whom I knew well, and expecting at least to get some plantains from him. His place is three miles from the shore, on the face of a high hill. He received me in state, with beating of drums and "present arms." After he had rehearsed his exploits, and I had complimented him, he presented me with two good head of cattle, a gourd of beer, and as many bunches of plantains as my men could carry.

July 3.—Put off in calm and dense fog; soon were off Dumo, where we met Nambigya returning from Kyigaju's with four canoes and present of ivory from Kyigaju to Mtesa.

In a wide bay south of Dumo it became so hazy that we lost sight of land. The boatmen could not steer, as the sun was invisible. I took out my compass and directed them. They took it for a charm or idol, and the chief of my canoe begged for it that he might carry it to a sick child of his whom he had left at home. He would recover at once! They followed the direction of the compass more from their faith in its virtues as a charm of divination than as being a scientific instrument. Finally, we reached the promontory of Saango, where we camped and made huge fires to dry our beef to preserve it for the voyage. Half-roasted and half-smoked in large pieces, it keeps from ten to twenty days. The extreme moisture of the air in Bu-ganda and Bu-zongora causes meat to smell in two, or at most three days, while in U-sukuma the air is generally so dry that a carcase will keep a week if hung up in the open.

July 4.—Passed the mouth of the Kagëra. All this part, and in fact the whole coast of the lake, needs correct mapping, which I hope to be able to do when our boat is afloat. Stanley's map is merely a sketch, and very, very far from accurate. It will be a matter of many months to map the whole lake with any degree of accuracy. But it must be done, even for our own sakes in sailing, especially at night.

Crocodiles of enormous size guard the mouth of the Kagëra, and are regarded by boatmen as possessed of the spirit of the river-god. This word *Kagëra* must be distinguished from *Kagëva*, which is the name which the Ba-ganda give to Smith Sound, between Mwanza and Rwoma's.

We put ashore at a point in Kayoza's territory and set off to call on Mugula, who is encamped a few miles from here on his way back with thirty canoes from Jangiro. As we mounted the hill it came on to rain very heavily, and in spite of my umbrella I got rather wet, whilst those with me were drenched. It was very cold the whole day afterwards, and the poor fellows got severe catarrh. After the weather cleared up we stumbled up and down on a rocky slope in a plantation for more than an hour, looking for Mugula's quarters. We found him at last; he received me cordially, and provided me with abundance of plantains and some fowls, besides huts in which to sleep. But we had arranged to return to our canoes, which we had ordered to join us round the point. They rounded two points, however, and these were well-nigh inaccessible by land. I sent messengers to find them, and after dark one canoe returned for me. We reached camp in Kayoza's Bay, at a late hour.

July 5.—Day broke with thunder, and it rained most of the forenoon. The rocks here have a very stalactitic appearance. A stream of semi-fluid lava has metamorphosed all the strata, forcing its way between them in most cases and tilting them to the vertical in many places. In other lower parts it has flowed over the surface, and where it reaches the lake has been scooped out by the waves, thus forming caves of which the roof has been bored through by the rain in many cases. These holes are dangerous, for, being hidden by the long grass, they form so many pitfalls in walking. It is the uplifted metamorphosed strata that have been weathered away to points that present the stalactitic appearance. These are

often in groups on knolls, and look not unlike village churchyards, with various-sized dilapidated tombstones.

We embarked at 3 P.M., hoping to reach Makongo, but did not succeed. Put in at sundown by low rocks in a bay next to the one where Wilson and myself spent two months repairing the *Daisy* nearly four years ago. It blew cold all the early part of the night, but, happily, there were no mosquitoes. Almost no firewood to be had.

July 6.—We got early afloat in calm. Soon heavy rain appeared at sea to the east, moving southward. As it was getting rough, we put ashore on the lee side of the island Musira, off Makongo. Here was a very large camp, probably made by Mugula and his fleet. A sharp storm of rain came on from north-east. With a struggle we got the tent up and the goods under cover. When it cleared up the wind as usual changed to the south, and a high sea rolled in the channel between our island and the mainland. But we could not spend the night in this filthy camp, so we risked crossing the channel, and by the mercy of God reached a cove on the mainland safely, although the waves were very high, and all but swamped our frail canoes. This place lies between Makongo and Bu-bembe, and is called Bu-koba.

July 7.—It was calm overnight, but at dawn came on a squall, with sparkling rain. It was very rough outside, the sea running high all day. We lived on spur-winged geese, of which I shot a brace yesterday at Musira Island. The Wa-ngwana eat these, as also the Ba-sese canoe-men (who eat in fact everything), but the Ba-ganda decline. The captain of our fleet, Kabona, here fell sick. I sent my men to the neighbouring villages to buy a stock of food for the days ahead when we can camp only on uninhabited islands all the way from Bu-bembe (Kaitaba's) to Kageye. They brought in a few bundles of beans, exactly like French beans; also coffee-berries, fowls, and plantains, but everything dear, as the Ba-ganda warriors have devoured much of the natives' provender.

July 8.—It was calm this morning, so we embarked, hoping to fetch Bu-bembe promontory. When we got near Kisaka Island, just opposite the promontory, it began to blow hard, and we had to go ashore at the point at the north side of the first bay. This was a vile place for camping in, but we got some shade from a large tree. My boy, Sambo, brought me some resin from a tree in the neighbourhood, exactly like red sealing-wax, only somewhat soft.

July 9.—The night was calm until near dawn, when a gale arose from the south with thunder at sea. Day bright, but sea very high. Took a round of bearings from Alice Island to Bu-bembe, with prismatic compass.

July 10.—It was calm again at night, but about 3 A.M. it began to blow hard from the south-east. During the day it was slightly overcast, wind and sea high. We planned to start in the afternoon if the wind fell, as our supply of food was getting low, and the young moon would serve us for several hours after sundown. Many of the Ba-bumbire are here. Their canoes are rough models of those of the Ba-sese, but workmanship very inferior. They venture out in very rough weather with them, which no Mu-sese would risk on any account. Wind and sea gradually fell towards afternoon, and by 4 P.M. we made a start. Pulled across the channel and coasted along the west side of Bumbire, hoping to reach the small wooded island, Lubili. The moon set, however, by the time we got as far as Mayiga Island. We put in at a wretched place of bush and rocks; and well it was that we did so, as soon after the wind rose and blew hard all night. We set fire to the dry grass on the top of the islet, and all night our camp was brightly illuminated. On the mainland they doubtless thought us to be of the war-party.

July 11.—Bright all day, but high wind till afternoon. Our cove faces the open sea to the east; hence the breakers did not subside enough to let us launch the canoes,

the place being besides very rocky. In the evening I climbed to the highest point in the centre of the island, and took a round of bearings with the prismatic compass. The summit of Soswa was barely visible with the binocular, and quite invisible with the naked eye. There is a deep bay to south-west with many islands in it, which will require care in surveying. All the mainland opposite this, as also Bumbire, Iroba, Muzinga Islands, present bare bluff ranges of rock and stones, but not so craggy as the coast from Bu-bembe north to the Kagera mouth. Between that again and Bu-ganda the shore is low and even wooded.

July 12.—We are still prisoners here. Night again calm, but wind rose as usual with the sun; only to-day it is more moderate, and slightly more easterly, being S.E. $\frac{1}{2}$ E. In the evening we succeeded in launching the canoes, empty, through the breakers, and sent them round to the lee side of the island, where we found a recess among the rocks, just large enough to let us load the canoes one by one. Made for Lubiri Island, almost due south, reaching camp about 7 p.m. Felt drowsy and out of sorts, as if an attack of fever was near.

July 13.—Soon after midday, the weather being moderate, we embarked for the pull across the wide reach to Soswa, off to east, but not visible till we get about half-way across. A bilious attack rendered me unfit to sit up or read. Thank God for fair weather in this dangerous reach! We arrived at Soswa in a dead calm about 9 p.m.; found plenty of huts, but some hippopotami about the landing-place, among ambatch trees, made us active in our movements.

July 14.—Sea rough outside. The boatmen were too fatigued to start to-day. Before crossing the bay of yesterday, the Ba-ganda and Ba-sese called into service all their most potent charms. On embarking, they put some bananas on a paddle, and throwing them into the water, offered up a prayer to the lake god, Mukasa, "Oh, Lubare, come and take this offering to thee, and grant us that we may reach the other side in safety!" Not a few of them perish, however. Their canoes cannot stand a heavy sea, and are easily swamped. Whole cargoes of ivory are often thrown overboard. The boatmen themselves can seldom swim, and are, besides, terribly afraid of crocodiles, although very fond of the flesh. One crocodile's tail alone will purchase two goats! I believe the tail is nearly all fat, something like the white layer under a hippopotamus's skin. The Arabs are just as superstitious as these poor heathen. Before crossing Soswa Bay they select a small tusk of ivory, and, holding it up that all the boatmen may see it, throw it into the lake to propitiate the deity.

July 15.—Still down with fever. We embarked at dawn, and halted at noon on a low rocky island for breakfast. I took an emetic which did not do me much good. At sundown reached the now uninhabited island of Kulu, off Kyigaju's coast. This island, with its neighbour, To, as also Soswa, Lubiri, Iroba, &c., have been all devastated by the Ba-ganda.

July 16.—Our food all but exhausted. Crossed over to mainland, at present friendly, but formerly very hostile, in hopes of being able to get or buy plantains. After much palaver with the natives (Wa-zinja), the local Mulangira (prince) made me a present of two bunches of plantains and a pot of beer, which latter delighted the hearts of the canoe-men. The natives themselves were all drunk. Their beer, made of banana juice with ferment of *bulo* (or *bulezi*), a very small grain like canary-seed, is much stronger than that ordinarily drunk by the Ba-ganda. We soon left; but the sea was far from calm, while the boatmen paddled lazily. We encamped for the night on a deserted rocky island (Lwa Mulangira), off the coast of Rwoma's country. Rwoma is at present hostile to Bu-ganda, and the natives on the mainland seeing our fires, and fearing that we might be a war-party, beat their drums all night. This was perhaps the most wretched camp I had ever seen.

I could find a level spot nowhere large enough to pitch the tent upon. The land was all a ruin of pointed rocks and stones, half-bid with grass. I spent a sleepless night, taking two full doses of Warburgh's medicine.

July 17.—Feeling most wretched and sick all day. Put ashore at low bamboo island called by the Ba-ganda Maua, hoping to find firewood, but saw none. At dark we drew up our canoes near the petty village, in the country of Mwanza, where Sungura has established himself. As this place is only some two hours from Kageye, I wrote a note to our brethren there, sending it over by two Wa-ngwana. We obtained here some milk and gruel of matama which revived me not a little, being the first food I had been able to take for a week.

July 18.—Early up, and soon reached Kageye.

THE LAND JOURNEY.

July 26.—Gordon and myself set off for Msalala with one tent and only a few loads of private baggage. Marching 12 miles S. $\frac{1}{2}$ E., we encamped under a tree in a very dusty kraal, near the boundary between U-sukuma and U-smawo.

July 27.—Marched 10 miles very zigzag, but on the whole south. Skirted the edge of a rocky hill, and finally encamped near a bushy sierra lying to our right on the border between U-smawo and U-rima. Many Wa-tusi herdsmen here, with their grass huts, and women dressed in prepared skins. Their language closely resembles that spoken by the Wa-zinja, Wa-kerewe, and Ba-yima. In the evening a demand was made on us for hongo. This we settled for one doti, which we paid to a fellow calling himself a sub-chief of Lindyati of U-smawo, whose kraal lies on the old caravan road from U-nyanyembe to Kageye.

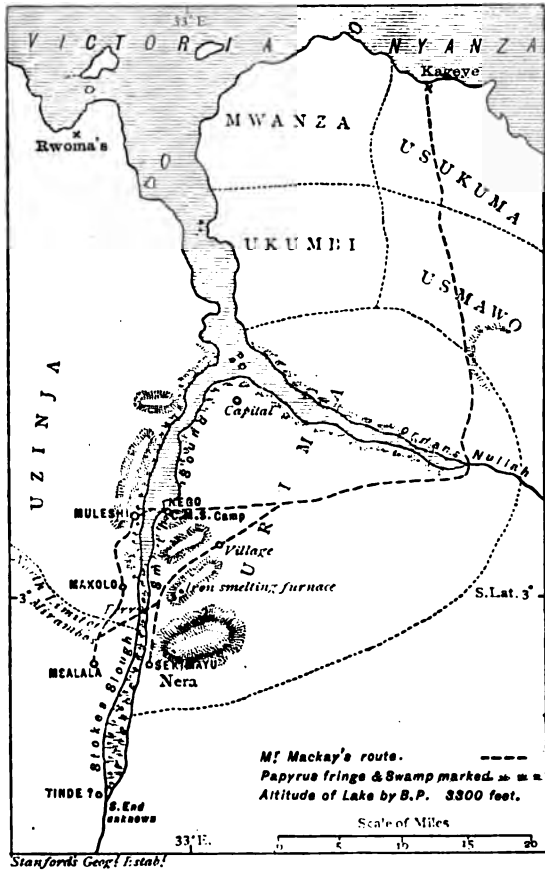
July 28.—12 miles through northern U-rima, route still south, but latterly more to west, passing many villages, to camp near the head of Jordans Nullah. One hour before reaching it we sighted the water, looking like a broad river or narrow loch. We gradually approached it near its head. Half an hour previously we crossed a running stream with high banks; the upper stratum being of black turf, and the lower of bluish stone, very probably limestone, for much of the rock in the exposed parts was white, and exactly like the lime crag got by Said-bin-Saif in the stream beds near Kageye. This will prove of no small value to any station even on the main creek, as the boat can come up this fork, "the Jordans," and carry off cargoes of it. No timber in this neighbourhood. All is under corn, except the rocky crests of the hillocks. The natives are busy threshing everywhere, and in some places still reaping. They have many pumpkins of small size, as also round cucumbers.

Sunday, July 29.—Halted for the day. Ill with fever and vomiting.

July 30.—One and a half hour's march south along the creek brought us to its head, where a stream enters. This was by no means large, but its banks and bottom were of terrible mud, in which the men's legs sank to the knee. It took us some time to get across, as Gordon and I required several men each to carry us over. After crossing we struck off west over a bare plain, the first part being a dried swamp. The natives had cultivated small patches in the hollows under corn. Their huts were always at some distance, and nestled at the base of the rocks on the hillocks, with a euphorbia fence on the plain side. We kept this direction for an hour, till reaching a village we found two paths, the right one to Kuikuru, or capital, the other, which we followed south-west by west, down a valley facing a mountain. This part is all jungle, rocks, and scrub. We then ascended some distance and encamped in a small village near a grove of unsightly Doleb palm-trees, all laden with fruit. We arrived very fatigued, having come in all some twenty miles. The natives call the stream which enters the head of Jordans Nullah, Usenyi.

July 31.—Marched about three miles south-west, partly through jungle, and descending we came to a neat village fenced by a euphorbia hedge. We were told that ahead was only jungle, and as the natives wanted us to stay there we encamped, being rather stiff after the long tramp of yesterday. They have beautiful honey here, but no milk, as Mirambo carried off all the cattle some six years since.

Aug. 1.—Three hours west and W.S.W. through pori between two high hills brought us to a grassy creek, which proved to be the continuation of the main arm which we call Smith's Sound, and of which the Jordans Nullah is only a compara-



tively small branch, joining the main bay in U-rima, a little to the south of U-kumbi. Smith failed to see the Jordans, the mouth or junction being probably closed by a papyrus dam. These hills have all a purple appearance, being bare of grass, and all ironstone, with a sprinkling of scrubby trees over them. All is elephant jungle and swarming with tsetse fly. We rounded on our left the base of the hill, where there are iron-smelting furnaces. Then we followed the grassy creek south for two and a half hours, till we reached the ferry just opposite Makolo's village by rocky clumps. We failed to come to terms with some men here, who had a small dug-out, and marched on S. $\frac{1}{2}$ E. for one and a half hour to a very small village, evidently the

last in U-rima, and perched on the top of rocks. We could find no space for the tent inside, hence we camped outside the stockade, by huts in which they smelt iron. Total march to-day about twenty miles. This village is called Sekimayu. From the rocks here I had a capital view of the creek, which takes a slight bend, stretching off to south by west for, I should think, a dozen miles, to Tinde in Satawe. To the east of Sekimayu the country is called Nera. Here we were right opposite Sonda's country of Msalala; in fact, we were somewhat past it, but in the provoking position of seeing it quite close, with no means of getting to it. There is no ferry here, while farther south the creek widens out considerably. The ferry we had passed is claimed by the owner of this village. I had a long talk with him, trying to show him the advantage to himself of trying to accommodate travellers by ferrying them across his creek instead of using extortion for his canoe. Still he demanded ten doti, afterwards coming down to six; but the sun went down without our coming to terms.

Aug. 2.—Fearing we should have to tramp round the head of the creek, which would take two or three days, I paid out two days' rations to each man. But in this poor place nothing is to be had, except ground-nuts. After much more palaver with the chief he agreed to ferry us over for three and a half doti of satini, saying that he had a very large canoe at the other side, which would carry us all at once.

We packed up and returned to the ferry, two paddlers coming with us. On arrival we found only the small dug-out of yesterday. Into this went my boy, with all the cooking things and dishes, and Gordon's servant with his valise. Next trip only one man with Gordon's bedding crossed. We were unable to control the loads, as there were first a hundred yards to be waded through the papyrus before reaching the point to which the canoe came. From high rocks near I could see that there was no stream or open water space in the creek for miles up or down, except a tortuous channel just here, stretching down to Makolo's; this being taken advantage of for a ferry. The sun was sinking, and the canoe did not return again. Our tent, and my bedding happily remained on this side, so we pitched in an old inclosure of thorns, getting some matama porridge boiled for our supper, a newspaper doing duty for plates, and our fingers for spoons. Mosquitoes were plentiful, but not worse than where we slept last night. Hyenas howled about, but nothing worse. Last night, towards morning, a lion kept us awake with his roaring close by.

Unhappily, to both north and south of this, the creek seems to be entirely choked with reeds and papyrus. I fear it is therefore quite impassable for a boat. This ferry is itself nearly useless, while it takes us through Makolo's country, and he has a reputation for grasping. We are in a fix. It seems useless to build the boat anywhere on Sonda's part of the creek, as further down it is altogether choked up. Unless we can carry it round the head of the creek, viâ Satawe and Nera, we must fall back on the road from Sonda's, north two hours to Makolo's, thence two hours further north to the first open water where there is a ferry to U-rima, near Nego. To carry the boat round will be a matter of great expense, as Sonda's people will not venture into U-rima, nor U-rima men venture to Sonda's, all on account of the former war between Mirambo and U-rima. But it still remains an open question whether the Mtemi (king) of U-rima will allow us to settle at all, or even build the boat in his country. U-rima has a large population, and seems, in many ways, a desirable centre for a mission.

Aug. 3.—The boatmen turned up at length with a larger canoe. Each trip took one and a half hour going and coming, on account of the narrow, tortuous nature of the passage. By noon we got all across. I am very glad that we came to this ferry, instead of to the open water over to the north, as I have had a view of the nature of the "gush" which chokes the creek. Papyrus, spear-grass, &c., all densely matted

together, twisted and twined, make about as formidable an obstacle as anything that could be imagined. By herculean labour this might be so slashed and cut and dragged away as to leave an open channel. But even were that done, I cannot say what depth of water would be found below.

We followed the creek south for an hour, then, striking across country, through grass and bush, we reached a village among rocks, said to belong to Sonda's mother. A mile more, and we reached Sonda's stockade.

Aug. 9.—Leaving two men in charge of the boat and goods, and taking with us only our tent and beds, we started for Makolo's, which we reached in two hours' march north, all through level jungle. We found his village destroyed by fire, and himself perched on the top of a rock and smoking. Brown ants had got into a hut one night, and in trying to burn them out, the hut caught fire, which spread at once over the whole village (all the huts being of straw as the Wa-zinja build, although the people here are Wa-nyamwezi, yet belonging to Rwoma). Old Makolo let us pass free, but hinted that when we brought the boat he would make us pay. Two more hours' march north through jungle, brought us to the village at the ferry where Ashe crossed. Some little distance back, the creek shows clear water in the centre, and here widens out into a fine bay, but still with a dense fringe of papyrus on both sides. This is evidently the farthest point reached by Smith in the *Daisy*. The chief, who is said to be a son of Makolo, demanded a tribute of eight doti of fine cloth, but after much palaver he agreed to take one. This again he rejected. Towards evening he paid us a visit in our tent, when I had much talk with him, trying to show him the folly of closing his road by such demands on travellers without goods. Day closed without finishing negotiations. Our tent being pitched close to a bank of papyrus, the mosquitoes were truly terrible. We tried to smother them out of the tent by smoke, but succeeded rather in smothering ourselves.

Aug. 10.—The chief was content with Gordon's penknife, and his head man with a common sixpenny clasp-knife of mine. Struck tent and proceeded 200 yards along the bank to the ferry. Here we found six canoes, all of solid log, arrived from the U-rima side. The demand of their owners was ten doti. Palaver brought this down to two, which I agreed to pay. Two of the canoes were sufficient to take us all over at once. The landing-place on the U-rima side was by far the best I have seen, being wide, and the belt of papyrus very narrow just here. Encamped in a small village close by to take time to look about.

Took a walk alone to the top of a stony, scrubby hill close by. I observed that a very broad belt of papyrus bounds the water for many miles to the north. This is occasioned by the land being level, the high hills receding some distance. The high hill to the east is, however, the last of the range on this side. North of that the country is open and cultivated, with rocky granite knolls, just like U-sukuma. West, on Rwoma's side, a bold range of mountains, apparently all of the same ironstone as is found here.

Expense will be saved if we build the boat at this spot, should we get permission from the powers that be, as the harbour is good, and we may carry the boat far, at much cost, and find no port better. Ultimately, a permanent site for a station can be sought near the villages to the north-east, where cattle can be kept free from the terrible tsetse, but yet sufficiently near the jungle to find wood for both fuel and building—heavy items. Only red grain here, which is less to be desired than the white. No cattle, hence no milk. Fish said to be plentiful. Mosquitoes troublesome, but not so bad as the situation would lead one to expect.

In the evening Gordon and myself took a walk, and climbed the north shoulder of the end hill. Gordon sketched the range on the opposite side. The view of the

bay from here, as well as from the hill just above the ferry, is very fine. We found several villages near, and very many away on the open ground, north and north-east.

Aug. 11.—As we wanted to see the king, we set off north round the bay of papyrus, then struck north-east, and after six miles' tramp we reached the village of a Mwanangwa, who is said to be son]of the Mtemi (king), who lives some ten miles further north (probably near the junction of the Jordans Nullah and this the main creek). The village of this Mwanangwa (prince) is snugly nestled among granite boulders at a considerable rise from the lake. The prince is a tall young fellow, and rather afraid of the Ba-zungu. On explaining our wish to build our boat on the bay, and ultimately settle in U-rima, if they wished us, the prince said that his authority did not extend beyond his own village, the land of which did not reach to the port, and that we must first consult the Mtemi, who owned the whole of U-rima. We could not go to the capital ourselves as the king will not see strangers, but the prince would send a messenger to the capital to-morrow. He left our tent, but did not omit to come back in a short time and beg for cloth, which we did not give him. My coat he especially coveted. Yesterday there was much thunder among the high hills to the south-east of the ferry about midday. To-day it has been very cloudy and threatening all day, although this is the height of the dry season. Thunder at noon, and again all evening after dark, with, what is more rare, lightning visible. A few drops of rain fell overnight. The wind, which blew strongly from the north yesterday, is to-day a light breeze from west.

Aug. 12.—The day opened very dull, with a cold south-east wind. Food plentiful and cheap, quite a contrast to the neighbourhood of Msalala. Matama-meal, sweet potatoes, bananas, sugar-cane, semsem, fowls, milk, and eggs. Water fair, while at Sonda's it is vile. Salt seems scarce; cattle and goats plentiful. The prince was pombe-drinking and turned up to see us, clad in *puris naturalibus*.

Aug. 29.—Very threatening and dull the last two days with rain at noon. Made a rain-gauge of a frying-pan, using fluid ounce measure to find amount. The rest is only a matter of simple calculation. Sent Jumah back to join his mate at Msalala. I was in hopes that the Mwanangwa here would have gone to the capital to-day, but he had a brew of beer and therefore could not go. Probably the king's man may return in a day or two, hence it does not matter much whether the Mwanangwa goes now or not. Tabulated all the meteorological observations I have taken since leaving Bu-ganda, and fixed up maximum and minimum thermometers in the shade for daily registry with my aneroid. I wish I had a pair of wet and dry bulbs here, as the extreme dryness of the air at this side of the lake is remarkable compared with the moisture of Bu-ganda.

Aug. 31.—Contrived a boiling-point apparatus with teapot, and wooden lid with a central cork through which the boiling thermometer can pass. With this I took a series of readings at noon in camp which stands about 50 feet above the lake. B.T. = 205·6 (same for six readings), temperature of air 86°. Taking barometer at sea-level 30", this gives 3515 feet for level of lake. But the barometer at the sea-level is probably only 29"·7 (1. = 32); hence the true level of lake would be only 3300 feet, which is some 500 feet under Stanley's reckoning. The thermometer is a fine one of Newton's make. My aneroid at the time read 27"·085 or 3650 feet. It was found by Dr. Roll, in Zanzibar, to read 3075 feet (in his house alongside of his mercurial barometer). Temperature at time probably same as here, 86°. Allowing his house to be 25 feet above sea, this would give 3400 feet as lake level by aneroid, or again 400 feet below Stanley's reckoning. But Dr. Roll, I believe, read his barometer always about 8 A.M., when at the maximum, and as the daily range (here at any rate) is nearly 6"·2, we must take 3065 as the noon reading, which

would bring the difference of readings by aneroid here and at the coast still closer to the B.T. reading, viz. (3650 - 50) - 300 = 3300 feet.

Sept. 11.—Reached Msalala. Here I purchased a quantity of rice and maize, as these things cannot be had near our camp in U-rima. I bought besides some cotton for caulking, as what was sent from England was much of it used up on the march, for tying bundles with. I laid in a stock also of ground-nuts, which are rather scarce in U-rima. We have no linseed oil, and hence must manufacture from these enough to pay over the boat inside and out.

All evening the men sat smoking bhang and coughing violently. When the paxoxysms were over they began to sing. Gradually the music increased, and I took a seat on a zebra-hide beside the young chief. On one side sat the older fellows, roaring out in perfect time an endless song of U-nyamwezi, while on the other stood a row of little boys and girls, whose finer voices helped to make the choruses more musical. The band-leader was a poor leprous lad without fingers or toes, but quite an enthusiast in his art. What a change to me from unmusical Bu-ganda, where such singing is quite unknown. I forgot my fever in my delight as I listened to this rare concert, which reflected the highest credit on such a race as even the Wa-nyamwezi.

Sept. 15.—One would naturally fancy that a long stretch of water like this creek would have some climatic influence on the neighbourhood. But such is not the case. High ironstone mountains guard both its sides at the south end, all destitute of grass, with but a few scrubby trees and bushes, where elephant, giraffe, and lion find an undisturbed field of roam. As I expected, the whole of these tracts are swarming with the tsetse fly—fatal to horned cattle. The reedy slough has little papyrus in it, whilst its banks are sharply defined. With one foot you can stand in water, and plant the other on dry, parched soil. The only influence which the slough seems to have on the adjoining shores is to cause the whole neighbourhood, for many miles on each side, to be nightly flooded with those incorrigible tormentors—mosquitoes. At one time, in consideration of the political difficulties connected with getting a port clear of Rwoma's jurisdiction and out of the power of the greedy Warima, I thought to build and launch the boat on the Msalala shore of the slough, a faint streak of water being there visible in the centre for a short distance. But close inspection of the few miles between that and the open water convinced me that were we to launch the boat at Msalala it would be a herculean task to cut a canal for it down to the clear water near this. By-and-by, should Rwoma cause us trouble, seeing that our road from Msalala to this port, i. e. our road to Bu-ganda, must pass through some 10 miles of his land, it may become absolutely necessary to cut a clear way for the boat right up to Msalala. Even at present, were that done, a heavy tribute and all the expense of these 10 miles of land carriage would be saved to the Mission on all goods for Bu-ganda or any other station which may in future be planted on the main lake.

By way of postscript to the foregoing we append the following extract of a letter we have received direct from Mr. Mackay, dated 10th December, 1883, "Head of Smith's Creek, Victoria Nyanza, S. lat. 30°":—

"You will be interested to hear that the Church Missionary Society have launched their vessel the *Eleanor* on Victoria Nyanza. I expect to start across the lake with her to Bu-ganda in a day or two, and hope by her means to be able to make an accurate survey of the whole coast. I have already surveyed much of the western side. Stanley's charts are wonderful for the short time he had at his disposal, but extremely

inaccurate so far as I have been able to test them. Judging by the west side, the survey of the east shore made by him must be very far out.

"The only accurate survey I have seen of any portion of Victoria Nyanza is that made by Lieut. Shergold Smith, of the Church Missionary Society, of U-kerewe, Speke Gulf, and what is called Jordans Nullah. Strange to say, all published maps are erroneous with regard to the last-mentioned. The name 'The Jordans' was given by Speke to a nullah at the head of the creek he saw on his visit to Mwanza. But map-makers have applied the name 'Jordans Nullah' to the whole creek, which is in no sense a nullah, nor was called such by Speke. This creek has *two branches*. Speke saw one only, the eastern, and Lieut. Smith, in the *Daisy*, missed this eastern branch (probably owing to its being choked up by papyrus) at its junction with the main creek which he followed to its head at Nego. I have crossed the Jordans where Speke crossed, and seen that arm; but this branch running to the south-west is the main one. From this point a nullah runs far off to the south fully twenty miles. Recently that was open water, but it is now entirely choked with reeds and papyrus. Even canoes cannot cross it, although the water is deep.

"Both sides of the creek here (at Nego) and of the nullah southwards are mountainous, quite a contrast to the head of Speke's arm at 'The Jordans,' where all is flat.

"If the geography of the Nyanza is of much interest to the Society I shall be glad to send you some sketches from my observations. Our maps are ever reproducing an erroneous outline.

"The map I have, by Stanley, gives the height of the lake as 3800 feet. I believe that this will be found to be 300 feet in excess. Details of my observations on this you can have if you think the matter of importance."

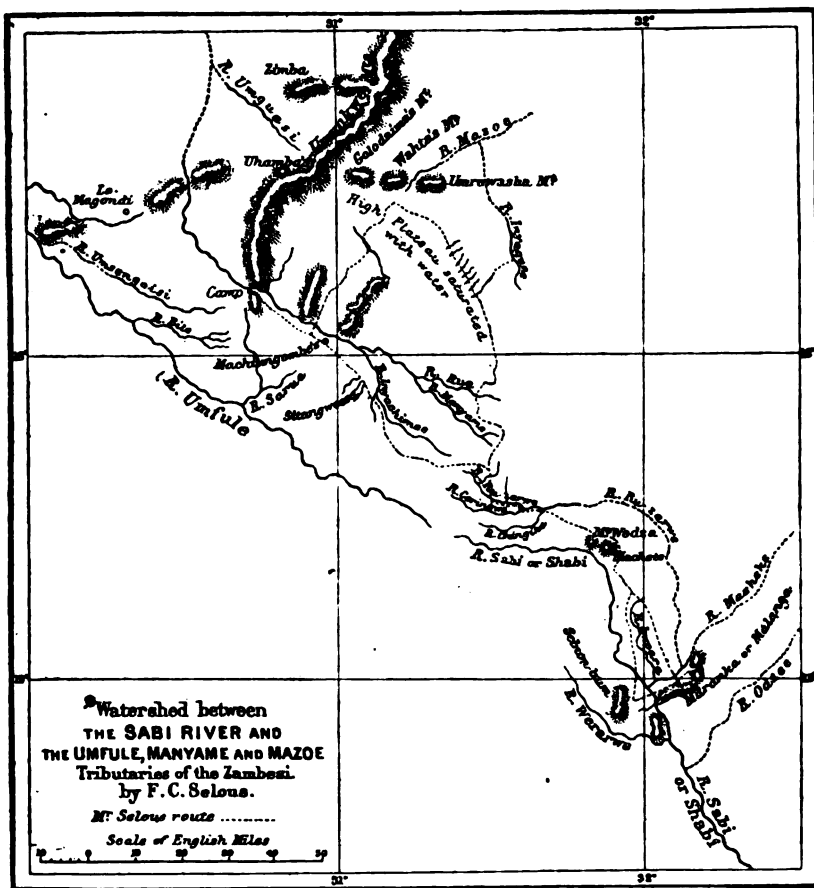
GEOGRAPHICAL NOTES.

Mr. Joseph Thomson.—Up to March 17th no news of Mr. Thomson had been received at Zanzibar. It is now eight months since he has been lost to view in the far interior. It is believed he has progressed without meeting with serious obstacle, otherwise intelligence would have reached the coast. The authorities at Lamu, Pangani, and other places on the coast have instructions to report quickly any news that may arrive, and render assistance if necessary.

German Official Mission to Western Africa.—Dr. Nachtigal left his consulate at Tunis on the 17th of April for the West Coast of Africa and the Congo, on a Government political, scientific, and commercial mission. He will be joined by Dr. Buchner, the well-known scientific traveller in Angola and the neighbouring regions.

News from Lake Tanganyika.—Sir John Kirk reports from Zanzibar that Mr. Hore, the able manager of the London Missionary Society's Stations on Lake Tanganyika, had been disabled by a paralytic attack, affecting the use of his right side. Such attacks, he adds, are not uncommon in severe cases of fever, and their effects usually pass off; indeed he had already heard that Mr. Hore was better. The loss of Mr. Hore's services would be most severely felt at this juncture, so many of his colleagues having been invalided and the important work of mounting the lake steamer *Good News* remaining still to be done.

Mr. F. C. Selous' Explorations in Central South Africa.—Mr. Selous has lately been exploring a new tract of elevated country lying near the head-waters of the Sabi and some of the southern tributaries of the



Zambezi. In a letter written from Klerksdorp on the 29th of February, he gives us a brief description of the district, illustrated by a sketch-map, which we here reproduce. He says he has assumed the position

of Lo Magondi's town as fixed by Mr. Baines, and that of, Mount Wedza as laid down by Herr Mauch, to be correct: the courses of the rivers as drawn will then be not far wrong. He went to the very eye of the fountain that forms the source of the Hanyane or Manyame, and found it much further to the south than placed by Baines. On the other slope of the rise from which the river springs, the streams flow to the south into the Ruzarwe, one of the main tributaries of the Upper Sabi. In passing from the Hunyane to the head-waters of the Mazoe, Mr. Selous traversed a high, dome-shaped plateau, saturated with springs forming the sources of all the neighbouring rivers. He considers it to be the highest land in South-Eastern Africa: a cold wind blows almost uninterruptedly from the south-east; "a wind so sharp and keen, that it seems to come direct from the icebergs of the Southern Pole"; wherever there are trees, they are always bent over to the north-west by the prevailing wind. Mr. Selous is of opinion that no part of South Africa is so well adapted for European occupation as this tract of elevated country; he says, "The very best parts of the Transvaal are not to be compared to it; it is splendidly watered, droughts and famines are unknown, and nowhere do the natives get such abundant and diversified crops as here; rice especially is grown in large quantities. I suppose before many years are over the Boers will get hold of this country."

The Giraud Expedition.—The French traveller, M. Giraud, has been compelled, on account of the hostility of the natives on the Luapula, to retreat to Karema to refit before proceeding to the west coast via the Congo. He descended for some distance the Luapula, which he found to flow out of the south-west side of Lake Bangweolo, as shown in Ravenstein's map of Eastern Equatorial Africa.

Death of Dr. Pogge.—The death of this distinguished German explorer is announced as having occurred at S. Paulo de Loanda, on the 17th of March. He was the most adventurous and successful of all the many accomplished travellers sent out by the German Society for the exploration of Equatorial Africa during the eleven years since it commenced its operations. When he joined the great expedition under Homeyer and Lux sent out in 1874, with the object of reaching the distant capital of the Muata Yanvo, it was only as an amateur sportsman and naturalist allowed to accompany the expedition on paying his own expenses; but the return invalided of both commanders to the coast gave him his opportunity; he decided to take the command and go on, the result being one of the most successful and interesting journeys of recent times. He published a narrative of his exploration in 1880 under the title of 'Im Reiche des Muata Jamwo,' the important natural history collections brought home being described by various specialists in separate publications. In 1881 he started on a still longer journey,

in company with Lieut. Wissmann, reaching Nyangwe, on the Lualaba, whence he returned in order to carry out the mission with which he had been charged, namely, to establish stations at various points in the interior, his companion continuing his eastward journey across the continent to Zanzibar. Dr. Pogge was born in 1838 at Mecklenburg, and began his career as a traveller by visiting Natal, Mauritius and Bourbon in 1864.

The Proposed Deflection of the Oxus from the Aral to the Caspian.— At a meeting of the *Corps des Ingénieurs des Voies, &c.*, held at St. Petersburg on the 28th of March, a paper was read by M. Sviridoff on the exploration of the Uzboi (the old bed of the Oxus), conducted by the recent expedition under General Glukhovskoi. The Amu-Daria or Oxus, M. Sviridoff said, is as large as the Volga at Simbirsk, and is generally navigable for a distance of more than 1000 miles. Its water is charged with sediment, and like the Nile, it annually overflows its banks, leaving an alluvial deposit, which accounts for the extraordinary fertility of the Khivan Oasis. Owing to the large volume of water brought down in the flood season it inundates the country bordering its lower course, particularly its delta, causing much damage. In 1880, Khoja-Ili, Kinjak, Nazut-Khan, Bey-Bazar, and other towns were half destroyed, and communications between Fort Nokhuz and the town of Chimbai were interrupted for a week. On the frontiers of the Khivan Khanate the river Daudan and the old channels of the Kunia-Daria and the Urun-Daria detach from the Amu-Daria. Both these channels commence at the Basin of Sarikamish. The Daudan's exit from the Amu-Daria is not perceptible as it is covered by cultivated ground, but it comes into sight about 16 miles from the Amu-Daria, being filled with water from the canals of the Khanate, which flow into it. The water remains for a distance of 90 miles, when it becomes dry and is swallowed up by sand for the next 20 miles; but after crossing the Shamrat Canal it again becomes a regular watercourse, and at places takes the form of a large river, as at the dam of Kum-Burut, the wells of Kudja-Kuyu, and other places. It then draws on in a thin line as far as the Sarikamish Basin. On the banks of the Daudan are numerous side canals (at present dry), on which traces of cultivation still exist. The Kunia-Daria (or Daria-lik) leaves the Amu-Daria in the form of a small watercourse, winding in the broad hollows of the old channel. It goes as far as the dam of Kizil-Tokar (100 versts from the Amu), and is navigable for native boats. From the Kizil-Tokar dam the Daria-lik becomes a dry watercourse as far as the town of Kunia-Urgenj, below which it is called the Urun-Daria. Thence to the Sarikamish lakes it is a regular river, with numerous traces of civilisation on both its banks. Between Kizil-Tokar and Kunia-Urgenj water brought by the Laudan Canal from the Amu falls into the Kunia-Daria. This canal is large enough to be taken for a river. It is separated from the Kunia-Daria by a brick dam called Tash-Bend. On

the Urun-Daria, to raise the water's level, irrigate the adjacent country, and stop the flow of the river, the dams of Ushak-Bend, Sadak-Bend, and Egen-Klitch-Bend have been constructed. Notwithstanding their existence, when the water is at a higher level in the Amu-Daria it frequently bursts out, as for instance in 1878, when the water filled the beds of the Kunia- and Urun-Darias, and poured into the lakes of Sarikamish, the level of which rose about 28 feet, and the bottom of the stream deepened five or six feet. About 20 miles south of the lakes of Sarikamish a broad flat valley forms from the saline marshes; and on reaching the wells of Charishel gradually assumes the form and character of a river bed. This is the Uzboi. Below Charishel it drags on for another 20 miles regularly, but with a very slight incline. Below Siraja-Kum the bed of the Uzboi has the true river formation, which it keeps to its junction with the Caspian; its incline here corresponding with that of the Amu-Daria. The Uzboi has one long unbroken bed, presenting all the physical characteristics of a river—regular banks and an incline, steeper in its upper course and gradually falling off and disappearing entirely lower down. The deposits of a former river and masses of earth washed down by it are to be seen, and decayed roots and reeds on its banks, besides traces of former culture in ruins of an aqueduct and other buildings, containing various utensils, varnished ware, and cut glass. In conclusion, M. Sviridoff stated that, judging from the levelling and clearing operations carried out, he was convinced of the possibility of deflecting the Amu-Daria into its old course, viâ the Uzboi, to the Caspian; the floods of water that had on more than one occasion burst into the lakes of Sarikamish fully justifying this opinion. The Basin of Sarikamish could be filled with water from the river without very great difficulty or expense; and calculations show that only a small portion would evaporate, leaving enough to replenish the Uzboi as far as the Caspian, and all the more so as for a large part of its course the Uzboi already contains water, and abounds in springs.

Mr. Carles's Journey in Corea.—Some interesting details regarding this little known country are afforded by the report of Mr. Carles upon his journey into the interior, in November last, with Messrs. Paterson and Morrison, for a copy of which we are indebted to the Foreign Office. Leaving Shanghai on November 6th, Chimulpho was reached on the 8th, considerable difficulty being experienced in landing. Chimulpho, the port of Jenchuan, which is five miles distant inland, is being built up as fast as labour and materials can be procured, but as yet possesses only one house of European style. Striking inland, the road to the capital, Soul, is carried for some 10 miles through a partially cultivated district over low rolling hills, the clear cut outline of the mountains being seen in the distance, and after passing several hamlets reaches the Han river, between which and Soul a sandy plain extends, apparently the result of summer floods. It is 24 miles from Chimulpho

to the river by road, available for cart traffic, though no wheeled conveyances were seen either here or during the further journey north; and most travellers come this way, though the Han is apparently navigable for junks of over one hundred tons for some 45 miles up to Mapu, the port of Soul. Here it is about 200 yards broad, with a good depth of water close to its northern bank, and a strong tidal rise; but in the dry season Mr. Carles found only three feet in a reach two miles higher up, where it is much broader. The body of water in the lower parts of the river seemed, indeed, inexplicably small, considering the extent of its catchment area and the size of its feeders 100 miles higher up. Mapu extends for some miles along the northern bank of the Han, the closely packed houses covering the hill-side to its crest, though not stretching far back from the water. It has every evidence of a very active trade, and is only four miles from the capital, which is reached by extremely bad roads, alive nevertheless with traffic. Soul, which is three miles by $1\frac{1}{2}$ miles in extent, is situated at the foot of a steep range to the north, from which low spurs run, one of them joining a hill 900 feet high, on the south of the city. Its gates are of massive masonry, with two-storeyed towers pierced for guns, and its wall is 25 feet high, also solidly built of stone. Behind these substantial defensive works, the main streets exhibit a striking contrast, with their low thatched cottages, broad roads, and open aspect. The throng of people is very great, quite as large as in Peking, and along the central causeway loaded bulls and ponies pass in endless succession—some, with mountains of brushwood on their backs, standing patiently in the wider spaces, awaiting purchasers. The side streets are narrow winding lanes, often along rivulets, which serve as open drains and washing grounds; and in all cases the style of architecture is the same—wooden pillars supporting the roof and forming a frame for mud walls, though in the better class of houses these are faced with stones, tied together with millet stalks and pointed with cement. But little furniture is used, and the conditions of the interior are very simple, though there is an air of greater cleanliness and more warmth than is found in the houses of the corresponding class in Northern China. The broader streets are lined with booths, in which there is a good market for various vegetable products, fish, and beef; the shops for clothing materials, &c., are found in the side streets—hats, shoes, and cotton goods being the chief industrial objects. There is a marked absence of striving after colour and effect in decoration of streets or houses, and the Koreans apparently always take their meals indoors, in both cases differing widely from the Chinese.—After a few days' stay in the capital, Mr. Carles started northwards with a small escort. The barrenness of the mountains was very striking, though the valleys were much cultivated (rice and beans being the chief crops), their light porous soil having evidently been washed down from the hills. The roads were now good,

with villages along their sides near the capital; further north the valleys became contracted and more stony, a disintegrated granite country lasting for 70 miles. The course of the streams was a constant puzzle; each ridge disclosed a fresh watercourse, usually not more than 60 yards wide, and it seemed probable that a great part of their discharge must be carried away underneath the bed of the Han, into which they flow—a belief strengthened by the rapidity with which the country dries after heavy rains. As far as Kim-hua, the main road was followed to Gensan, the port on the east coast of the peninsula recently opened to commerce, distant 123 miles from Soul, with which a brisk trade is carried on. Mr. Carles notes that the matting used for covering goods in transit was made of human hair. Kim-hua, a town of official rank, undeservedly famous for cotton-silk fabrics, was simply a long straggling village of 400 houses, where nothing could be had except during the fairs, held every fifth day. This seems the rule in Corea, and as the party never happened to arrive anywhere during a fair, they sometimes had to wait more than ten days before they could even purchase a pipe. From Kim-hua a circuit was made among the mountains to the north-east and north, in the most beautifully wooded and watered country seen, the farthest point east reached being a little village called Tal-tien, about 40 miles in a straight line from the Pacific. The valleys here are very confined, and cultivation is found in patches as high as 3000 feet, though it is restricted as compared with China. Groups of ten to twenty houses were generally met with every two or three miles near the roads, but on striking into the hills habitations ceased, partly owing to fear of tigers. The fine timber brought down the Ya-lu and exported to China does not grow in this district, the flora of which greatly resembles that of Chefoo. Here the arrival of the party created a regular panic, though elsewhere no difficulty whatever had been experienced with the people. It was found impossible to get a wide view of the country, as the valleys were narrow, and the hills all about 3000 feet, but from a ridge at Tanghsien, further west, it seemed that the backbone range of Corea running north and south is here at its lowest, the highest peaks (little more than 5000 feet) being to the south-east.—Summing up the results of his experiences, Mr. Carles says that the people everywhere have plenty of food, firewood, and cotton clothes, with substantial mud-dwellings; great riches seem unknown, but the working classes are better off than in China, beggars are very rare, and there was no sign of distress, in spite of the bad harvest. The paucity of clothing, considering the intense cold of the winter, and the marvellous seclusion of the women, impressed him very much. As to trade, except as regards fine timber, it is essentially retail, and it would seem useless to import goods except to exchange for the apparently limited products, as the "cash" used would be of little use out of the country. Only one object of historical interest was observed, but constant evidences

of the influence of superstition were met with, though no temples or traces of religious observances came under the notice of the traveller.

Prejevalsky's Expedition.—Colonel Prejevalsky has telegraphed as follows to the Secretary of the Russian Geographical Society: "Alashan, 20th January. We have safely traversed the Gobi desert. The temperature in the northern parts of the desert was below the freezing point of mercury. We proceed to-morrow to Kuku-Nor." The telegram was received in St. Petersburg on the 13th of April.

J. McDouall Stuart's Track across Australia.—Mr. G. R. McMinn, Acting Government Resident at Palmerston, Northern Territory, South Australia, in his Quarterly Report dated 28th December last, just received, clears up the doubt which has hitherto existed as to the exact point where this great Australian explorer reached the northern shore on his memorable expedition across the continent in 1862. An examination of the country over which Stuart's track is laid down on our maps was found not to agree with the details of his diary; Mr. McMinn accordingly set natives to work with promises of reward, and their search along the coast, in company with Mr. Surveyor Kingston and Mr. Buckland, was rewarded by the discovery of the last tree marked by the traveller, whose initials still remain perfect, being very deeply cut, about two feet long. This tree is at the site of his last camp, two or three miles inland, approximately 11 miles to the east of where he is supposed to have struck the coast, thus placing him east of Wildman's river, which he supposed to be the Adelaide.

Mr. D. Lindsay's Explorations through Arnheim Land, Northern Territory, S.A.—The details of Mr. Lindsay's work in July–December last, during which he covered nearly 2000 miles, averaging 14 miles a day, are given in his official Report of 8th February last, and add many important points to our very limited knowledge of the country north-west of the Gulf of Carpentaria. Leaving Katherine station on July 23rd, after nearly a month's preparation, the telegraph line was followed south for 45 miles, when in consequence of the dryness of the season it was thought advisable to reach the table-land by travelling eastwards on the north side of the Roper, where excellent grazing and good agricultural lands were found, until reaching the Wilton, which was followed upwards for 60 miles to its source. This is described as a fine river with very large and easily accessible water-holes, running through a good strip of country, and having at its head a large tract of undulating land, some 2000 square miles in extent, surrounded by a range running from 50 miles west round the north to 40 miles on the east. Returning to the Roper, for a few days good country was found, succeeded by poor land, subject to inundations, and inhabited by treacherous and hostile natives who speared four of the horses of the expedition; and from this point along the coast, which was followed northwards, the most miserable scrub

prevailed, the only water being got from the trunks of certain trees. It should be observed that all north of the Roper is, with the exception of the coast-line (and even including that, as far as Blue Mud Bay), a blank on our last Government Survey Map dated 1880. A river called Parsons or Rose river was found to be a fine stream, though running through the same wretched country; it was followed inland to its head, which was in a good district, open, lightly timbered, and well grassed. Returning to the coast and still working northwards, Mr. Lindsay and his party were again driven to the trees for water, until the scrub region was left behind, and fine open and very well grassed plains were found near Blue Mud Bay, the natives of which were very friendly. A fine river, the Walker (not even indicated in the Survey Map), was found running into this bay, and was followed up for 40 miles in a straight line: it runs through a mountainous but on the whole very good country, with picturesque and beautiful scenery, and was considered to be by far the best in the Territory for stock watering as yet seen. Crossing the waterparting, a northwards running stream was at once struck and followed, proving to be identical with the Goyder, the mouth of which only is known in Castlereagh Bay. This stream was gradually enlarged into a fine river running through fair country, until level plains, bordered on the west by a fine yellow freestone range, were reached, extending 40 miles to the north coast, and seeming not only magnificent either for grazing or agriculture, but unsurpassed for sugar growing by any in the Northern Territory. Unless bars are found, which seems unlikely from the formation, the Goyder will apparently be navigable for 40 miles through this fine region, the natives of which were numerous, and inclined to be hostile. Turning westward along the northern coast through a very fine table-land country of open forest, fairly well grassed and very well watered, the party crossed the Blyth river, a fine stream, but not to be compared with the Goyder, which seems infallibly to represent the main outlet for Arnheim's Land, and on which the future capital must be founded. Mr. Lindsay during this part of his explorations was not without stirring personal adventure, as his horses were lost for five days and he was attacked by the natives, on whom he was compelled to fire in self-defence. The Liverpool, which from the chart looks like a fine river, was very disappointing, not even running at 20 miles from the sea, though the country below its sandstone ranges is very good and well grassed. Finding that these ranges formed a very broken and apparently impassable barrier towards the north, the party determined to travel homewards up the Liverpool, which they did for 20 miles through broken sandstone and on white loose sand until they were blocked in on every side by disintegrated rocks; and it was only after eight days of fearful work, with failing provisions and man and beast exhausted, that the level plains were reached at Jones's Creek, the identity of the

Flying Fox Creek and the Katherine river being incidentally established on the way home.—Mr. Lindsay's surveying work, which appears to have been very satisfactorily plotted, was carried on under considerable difficulties from the usual want of water and the lack of feed for his horses in many places. One horse had to be killed for meat, and it is evident, from his warnings to future travellers, that the natives, who are very numerous, are decidedly hostile, and can only be kept off by unceasing watchfulness.

Opening up of Northern Queensland.—The extensive mineral deposits at Cloncurry in Burke County, Northern Queensland, have led to surveys being made for a railroad northwards from that point to the head of the Gulf of Carpentaria, for which Mr. G. Phillips in his official Report thereon shows that the best route is between the Flinders and Norman rivers to Normanton, the future capital of Carpentaria. The Norman has an unlimited supply of fresh water and a magnificent land-locked harbour three miles long; it is protected by rising ground at Kimberley, and for eight months in the year has good anchorage during the south-east trade wind. Other physical advantages are pointed out; and it is proposed to connect this line by an eastward extension (350 miles in all) with Hughenden, the present terminus of the existing Northern railway from Townsville in Cleveland Bay, thus joining the eastern and western sides of the Colony.

Dr. Behm.—The April number of Petermann's 'Geographische Mitteilungen' contains a most interesting and touching biographical notice, by Hermann Wagner, of the late Dr. Ernst Behm, who had edited the famous geographical periodical of Perthes' establishment at Gotha since the death of Dr. Petermann. Dr. Behm was born in 1830 at Gotha, and was educated for the medical profession, but abandoned the career, soon after obtaining his diploma, for the study of geography, which he entered into with the greatest enthusiasm and made the business of his life. He entered the service of the Messrs. Perthes in 1856, and became Dr. Petermann's chief assistant in editing the 'Mitteilungen.' According to his biographer, the literary work of the periodical was Behm's special department, and he adds that all the articles, notices, and reviews that appeared without author's signature during the twenty-four years he was connected with it may be safely inferred to be the offspring of his industrious pen. The statistical part of geography was his strongest point, and the many articles which he published of this nature are distinguished for their completeness, accuracy, and lucidity of arrangement. He founded in 1866 the useful annual well known to all literary workers and statisticians under the name of Behm's 'Geographische Jahrbuch.' He died on the 15th of March.

The Kew Observatory (Watch Rating).—The Kew Committee of the Royal Society have announced that they are prepared to examine, at the

Kew Observatory, first-class compensated watches, for the purpose of rating them and of certifying their performance, under the following conditions:—The watches are to be delivered either at the Kew Observatory; or to the Secretary of the Horological Institute, Northampton Square, London, E.C.; or to Mr. R. Strachan, of the Meteorological Office, 116, Victoria Street, Westminster, S.W.; all risks attendant on their transit to and safe custody at the places designated being borne by the sender of the watches. Three classes of certificates, A, B, and C, will be issued with watches which pass a satisfactory trial. Watches entered for certificates under Class A must remain going at the Observatory not less than eight weeks; for certificates under Class B, not less than six weeks; and for certificates under Class C, not less than three weeks. It is not possible to ensure that the trial of a watch will commence until some days after it has been received at the Observatory. The fee for rating and issuing a certificate and abstract of results during trial for each watch will be payable on the notification that a certificate is ready to be issued for it:—Fee for a certificate of Class A, 1*l.* 1*s.*; B, 10*s.* 6*d.*; C, 5*s.* 6*d.* The fee charged for a watch that fails to obtain a certificate will be half that for the class under which it was entered. The statement of its performance will in this case be supplied, and if the watch shall have merited a certificate of a lower class, that certificate will also be given. The form of trial and the conditions under which certificates are granted have been drawn up by the Kew Committee, after consultation with the Director of the Geneva Observatory and the Director of the Observatory of Yale College, U.S.A., at both of which places the system is already in action. The Kew certificates will therefore have the same meaning, or nearly so, as those of Geneva and Yale.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—March 21st, 1884: M. BOUQUET DE LA GRYE, President of the Central Commission, in the Chair.—The Geographical Service of the Army presented the first two parts of the map of Algeria, scale 1 : 50,000, and also the sheets then published of the map of Tunis, scale 1 : 200,000. Colonel Perrier (of the Institute), the head of this department, offered some verbal explanations regarding these maps. The former maps of Algeria were, he said, incomplete, and it was resolved to replace them by a general topographical map upon the basis of the regular Government surveys. The complete map would comprise 200 sheets, 50 of which were already prepared and would be published before the end of the year, and the execution of the entire work would occupy ten years. It was prepared with six and even seven colours, and engraved on zinc, showing contour lines in the place of hatchings. Neither copper nor stone plates had been used in its preparation, these two materials having been replaced by zinc. This work would greatly facilitate the making of new roads and other public works in Algeria. With regard to the map of Tunis, Colonel Perrier stated that the survey had been made on the scale 1 : 100,000, and the map prepared on the scale 1 : 200,000; it would be complete in twenty

or twenty-one sheets, twelve of which were then ready, and the others would be published in the course of a few weeks. This map, although not comparable to that of Algeria, might be in the future consulted with advantage by public administrations. Later on, perhaps in ten years' time, it would be engraved on zinc in seven colours, like that of Algeria, and prepared on the larger scale of 1 : 50,000.—M. Dutreuil du Rhins communicated to the meeting news of the Brazza mission. Dr. Ballay, after having effected a successful exploration of the Alima, and gained sympathy for France all along his line of route (the Alima and Congo), had proceeded to the territory of King Makoko, where M. de Brazza, who was still at Brazzaville, was expected to join him. The king had remained faithful to the interests of the French mission. M. du Rhins, without explaining himself further, said that Stanley's true position on the Congo was well understood at the present time. The difficulties he had desired to place in M. de Brazza's way had been overcome; nevertheless it would not be possible to accede to all the present demands of the International African Association. It was further stated that M. du Rhins would shortly lay before the Society an abstract of the long and interesting reports of the French stations on the Ogowe, Alima, and Congo. Amongst the information to be found therein, there was a special account of the exploration of the Alima, which reflected great credit upon Dr. Ballay.—M. Michel Venukoff announced that the Trans-Caspian territory had just been, since the annexation of Merv, divided into four districts, the administrative centres of which were Alexandrovsk, Krasnovodsk, Askhabad, and Kautchit-Kala. The latter was divided among four district chiefs, and one of them was the author of the official description of Merv, the publication of which was recently announced by M. Venukoff. The author was M. Alikhanoff, and his work not being for sale, M. Venukoff thought it might be useful to give the main divisions of the book. Chapter 1st, History of the country up to year 1880; 2nd, Description of the route from Sarakhs to Herat, a road practicable for vehicles; 3rd, Geographical details of the Merv Oasis, the area of which is 1930 square miles, of the river Murghab, the length of which is 304 miles (490 kilometres), and of its tributaries, also information as to the climate, prevailing maladies, etc.; 4th, Ethnography, the division of the Mervians into two tribes and twenty-four clans, the number of the inhabitants, which is from 194,000 to 200,000, and particulars of the native administration; 5th, Manners and customs; 6th, Commerce and industry, together with a description of the fortress of Kautchit-Kala, and of the routes leading to Merv, Meshed, Khiva, etc.—News of the Rogozinski expedition (West Africa) had just been received by the Society. M. Etienne de Rogozinski wrote from Mondoleh on January 10th, 1884, to the effect that, having started with his companions for the interior on the 13th August last, he had discovered the upper course of the Mungo and its cataracts, also two lakes situated between the waters of the Cameroons and Calabar, and further the upper course and sources of the Rio del Rey. Encouraged by this success, the explorers then directed their course towards the frontier of the Mokonyes, but a tribal war prevented their advance, and they were compelled to retrace their steps. It was necessary to make a long detour in order to reach the country of King Mfonga from Bayong, and from there to the Liba lakes, which the natives called Riba, the distance from Bayong being six weeks' march. In returning, M. Rogozinski and his companions traversed the whole chain of the Cameroons Mountains. The chief of the expedition stated that he would shortly forward a sketch of the route followed by him, together with fuller details of the journey.—A communication, dated February 4th, 1884, was received from M. Ch. Ledoux, French Consul at Zanzibar, in which he rectified what he had previously said concerning the direction taken by M. Giraud, a lieutenant in the French navy, who was travelling in East Africa. M. Giraud was not yet on the Congo, as the

Consul had supposed him to be, but before proceeding thither he had gone to Karema in order to revictual and reorganise his caravan. Having started from Dar-es-Salaam on the 17th December, 1882, he had traversed Usaramo and Khuta without any difficulties, following the route taken by Burton. From Usagara he took a south-westerly direction, and crossed the Ruhaha, which, in all probability, emptied itself into Lake Nyassa, although this might not be shown on any map. Here the traveller commenced to experience the usual misfortunes—heavy tributes, compulsory presents, extortions of every kind, outrages, repeated demands, etc. After being compelled to stay one month in this inhospitable district, M. Giraud traversed the south of Ubena, in order to proceed to Nyassa, where he reached the village of King Mahura. He received a most cordial welcome from the king. Unfortunately, however, a quarrel arose between the men of his caravan and the natives, and the traveller was compelled to leave the country in haste. He then reached the Chambezi, which he followed in a southerly direction in order to arrive at Bangweolo. In consequence, however, of the excessive demands of the petty potentates through whose territories he had to pass, he determined to ascend again to the north, with a view of reaching Ketimkuru, from which place his letter was written. This was the substance of the report shortly to be forwarded by the traveller upon his scientific mission. The Consul's letter then gave news up to January 12th, 1884, of M. G. Revoil. The explorer, as had been already announced, not being able to proceed to Gananeh, had given up all attempts to make this journey, and had chartered a vessel, in which he was going to visit all the ports on the coast, pushing into the interior as often as possible. He would thus greatly increase his collections, and further would have due regard to commercial and economic interests.—M. René de Sémallé forwarded to the Society a copy of a number of the 'Manitoba,' a North American paper, which gave an account of the journeys accomplished by a Mr. J. B. Bruce, an inhabitant of Manitoba, but of French extraction. This traveller had traversed at different times the territories of the extreme North-West of America and the valley of the Mackenzie river. The Central Commission was therefore of opinion that M. Sémallé should be invited to put himself into communication with this venerable and modest traveller, with the view of obtaining from him, if possible, some more complete and accurate information regarding his various journeyings. Born in 1807, Mr. Bruce entered when seventeen years of age the service of the Hudson Bay Company, and, after a journey to the Atlantic Ocean as companion of Th. Simpson and G. Sinclair, was attached in the capacity of guide to the expedition of Richardson and Rae, which went in search of the remains of Franklin.—M. Emile Guiard, brother of one of the victims of the Flatters mission, called the attention of the Society to a despatch which had recently arrived from Uargla (Algeria). According to information contained therein, the head of Hamma-Ould-Chikat, who murdered Captain Masson, one of Flatters' companions, had just been brought into that town. A certain number of articles belonging to the same mission had also been recovered, and amongst other things a revolver in perfect condition, which belonged to the late Dr. Guiard, the brother of the speaker. The latter commented upon the despatch referred to, and expressed a hope that the Governor-General of Algeria, who was then at Uargla, would utilise his visit to encourage and stimulate the natives to such enterprises as the one which had cost this Hamma-Ould-Chikat his life, in order to insure the due punishment of the Touaregs and to avenge at least to some extent the massacre of the Flatters mission.—M. Romanet du Caillaud transmitted to the Society a communication regarding the town of Lang-son in Tongking, some 12½ miles (20 kilometres) from the Chinese frontier. After the capture of Bac-Ninh, the French troops, it was said, marched on Lang-son, but orders coming from home necessitated a retrograde movement. From

the same source another communication was received regarding the party of the Mings in China. The Chinese, it would appear, imagine that the Ming dynasty is not extinct, but that some princes of this line have taken refuge in the mountains of Quang-Si, where their descendants will await a restoration. If the yellow flag of the Taiping insurrection were set up again in Quang-Si, it might be supposed that, preoccupied with the fate of the Manchuan dynasty, the Court of Peking would henceforth leave the French in undisturbed possession in Tongking.—Dr. Hamy, Director of the Ethnographical Museum of the Trocadero, exhibited to the meeting a drawing, which had been sent to him, representing a scene of the expulsion of the bushmen in South Africa. The monument itself, upon which this scene was depicted, had been discovered by one of the members of the Evangelical Missions Society in the Basuto country in one of those caves which the bushmen preferred to dwell in, and where they had left traces, and these often artistic, of their passage. Scarcely, said Dr. Hamy, had half a century elapsed since the Basutos first took possession of the region of the mountains, where this relic had been found and whence they had driven the natural possessors, i. e. the Bushmen.—After the General Secretary had announced the departure of M. Edmond Cotteau, who, although only just returned from a journey in Siberia, Japan, China and Indo-China, had started again to visit the Dutch Indies and Oceania, the Chairman called upon MM. de Mailly-Châlon and Benoist-Méchin to read an account of their journey to Manchuria and to Merv. This communication, which brought the meeting to a close, will be inserted in the Quarterly Bulletin. Many Russians had come to the meeting with a view of hearing the two accounts read, among others the Russian Consul at Paris and M. A. d'Apleschëieff, state councillor of the Emperor and a member of the St. Petersburg Geographical Society, whose presence at the meeting was noticed by the Chairman.

— April 4th, 1884: M. BOUQUET DE LA GRYE, President of the Central Commission, in the Chair.—The Chairman stated that the first General meeting of the Society for the present year would take place on the 2nd of May, probably in the large Sorbonne hall.—The General Secretary then announced the departure of M. Elisée Reclus for Athens, Alexandria, Tunis, etc., and also of MM. La Martinière and Maurel for Morocco, and stated that these gentlemen had placed themselves at the disposition of the Society, should their services be required. This year the seventh National Congress of the French Geographical Societies would meet, as already intimated, at Toulouse, and Colonel Perrier, of the Institute, head of the Geographical Service of the Army, was expected to preside on that occasion.—A communication from the French Topographical Society stated that, at its general meeting to be held on April 16th and presided over by M. de Lesseps, M. L. Drapeyron, the General Secretary, would read a report on the organisation of a National School of Geography at Paris. The topographical lecture courses organised in the provinces under the auspices of this Society with assistance from officers in the army, already numbered thirty-one, and in the twenty-eight of which statistics were to hand had at least 2627 regular attendants.—It was stated that the "Société des Etudes Coloniales et Maritimes" had appointed a Commission of its members charged to investigate the practical means for organising a scientific and commercial exploration of the Niger. It was proposed to start from Bamaku, and to visit, by the aid of a gunboat which could be taken to pieces, Massina, Timbuctu, Burrum, then to ascend the Sokoto river as far as it was navigable, descend the same river, and also the Niger down to its mouth. The Society invited the Geographical Society to study the scheme.—M. Hansen-Blangsted forwarded a communication upon the "influence of France in foreign countries as regards geography." The countries referred to were Germany, Austrian Hungary, and Norway. It should be noted that even as late as the year 1865 the

'Mitteilungen' of Petermann gave all geographical measurements in German or English measures, but in 1869 kilometres were found indicated on the maps side by side with foreign measures. Since 1875 French measures had been almost exclusively adopted, at least as far as practicable, and they were found added where they were not used. The same could be said of the 'Geographisches Jahrbuch' and the 'Deutsche Rundschau für Geographie und Statistik,' by Dr. Umlauf, in Austria. In Norway, the ex-minister, Dr. O. P. Broch, in his geographical works had always added in parentheses French measures by the side of the Norwegian. Norway was the third maritime power as regards the tonnage of her mercantile navy, and in consequence of her commercial relations the influence of England was great in that country. The author saw in this fact a favourable indication that in the near future England herself might crown all by adopting the French metric system.—M. A. Colas, military interpreter in Algeria, having read extracts from M. Henri Duveyrier's work, published under the auspices of the Society, on the Mahometan brotherhood of the Senoussi, wrote stating that for many years he had devoted himself to the study of the religious orders among the Mahometans, which played a highly important part in their present politics. Being about to return shortly to France, he would communicate to the Society his observations on this subject, as well as the geographical researches he had made in regions of Africa as yet unknown, according to information gathered from the inhabitants of these districts while staying at Oran on their way to Mecca.—A member of the Society forwarded a number of a Bolivian paper, containing the report of Dr. Gumersindo Arancivia upon the discovery recently made of the skull of Dr. Crevaux, and also the account he gave of its conformation. M. A. Thouar, who was present at the meeting, doubted whether this skull was really that of Dr. Jules Crevaux. The news he himself had received only a few days ago from the Prefect of Missions on the Bolivian frontier stated nothing of the kind. An opera-glass, with the initials J. C. (Jules Crevaux), mounted in gold, had been found in the hands of the Indians, together with a sea-compass and sundry other articles, which would be forwarded to the Society. A collection of ethnographical specimens of the country, made as complete as possible, would also be received by the Society in due course. M. Thouar had made a collection of this kind, but unfortunately it had been lost. Since then, however, thanks to the exertions and care of Father Dorotheo, the collection had been, at the request of M. Thouar, reconstituted, and in the month of February the articles had been shipped for France.—M. Dutreuil du Rhins communicated an extract from a letter received from Dr. Bayol, and dated March 8th, 1884, from St. Louis (Senegal). The Governor of Senegal stated therein that he had just completed an interesting journey, during which he had been much occupied with the geography of the French possessions on the lower part of the coast. He intended shortly to publish an account of the Buramaya river, which emptied itself into the estuary of Dubreka, opposite the Loss Islands. This Buramaya was none other than the Konkury (or Konkuray), which proceeded from the very centre of Futa-Djallon.—In conclusion, M. Hugues Krafft, a young French traveller, who had passed eighteen months in Japan, gave some extracts from his diary. M. Krafft brought home a large number of photographs, representing scenes of the domestic life of the Japanese, which he exhibited to the Society. Other photographs, illustrating his remarks, were shown to the audience by means of oxy-hydrogen light.

—April 18th, 1884: M. BOUQUET DE LA GRÈVE, of the Institute, in the Chair. —Captain Bernard, now on garrison service in Algeria, transmitted to the Society the first part of a paper which he is preparing upon the halting-places throughout the whole province of Algeria. The first part of the work extended over about

800 miles (1300 kilometres) of roads traversed by him during last year. The complete work was expected to cover 3780 miles (6000 kilometres) of roads in the country, and would possess importance from a geographical no less than from a military point of view, being of great service alike to officers on the march and travellers.—M. Daubrée, of the Institute, communicated a letter received from M. Nordenskiöld upon his last expedition to Greenland. It seemed that the distance traversed in the interior had been found to be exaggerated by the Laplanders who accompanied the traveller, and who were provided with their skates or "skidors." In order to elucidate the actual truth, M. Oscar Dickson, at the request of M. Nordenskiöld, had organised a skating contest as far as Quickjock, in Lapland. This original sport took place on April 5th. The distance to be travelled was 141 miles (227 kilometres) there and back. The winner of the prize, which was 350 francs, was the Laplander who accompanied Nordenskiöld. He took 21 hours and 22 minutes, including a rest, to accomplish the journey. All the competitors arrived at the finish in perfect health and took part in the festivities organised in connection with the contest. The night before several of the skaters had come from 40 to 60 miles from their homes.—M. Ch. Gauthiot, General Secretary of the Commercial Geographical Society of Paris, communicated two letters which he had just received. One, dated March 24th, 1884, was from M. Abel Le Savoureux, and written from Corerah, on the river Tatalah (three days' march from Futa-Djallon, West Africa). The writer furnished therein some information upon the climate, and stated that what he had previously said concerning the region of Corerah was applicable also to that of Boffa, on the Rio Pongo, where the correspondent had recently been located, and whence he had already written to the Commercial Geographical Society. Since the month of January everything in the country had been dry and parched. The vegetation was not able to stand against a temperature which in March and April reached 126° Fahr. (52° Cent.) in the sun. M. Le Savoureux, who arrived in the country in February 1883, had experienced the hottest season of the year. It was true that the climate there was subject to very rapid changes of temperature. From May to the middle of November the heavy daily rains gave new life to this parched vegetation, and in a few days everything was again verdant. The natives profited by this season to sow ground-nuts, sesamum, millet, rice, and maize. Corerah was, according to the writer, situated some 25 miles (40 kilometres) inland, and was rightly regarded as more healthy than Boffa. M. Le Savoureux stated that he was the only white man in the place, and the second foreigner who had been authorised to stay in the locality, where he was director of a factory. The province of Kebu formed the frontier, and separated the country (the Susu) from Futa-Djallon. At the time of writing civil war was raging in the province. The petty kings nominated by the different almamys were disputing with each other the supreme power. In consequence, the traffic with the interior was temporarily suspended. The Susus formerly occupied Futa-Djallon, but two centuries ago, in consequence of civil wars, a strong party of malcontents made an attack upon the Mandingos, who, being driven back, fled and extended themselves along the coast. The second communication made by M. Gauthiot was dated February 28th, 1884, and emanated from M. Ordinaire, Vice-Consul of France at Callao (Peru). He enumerated the different explorations recently made on the river Madre de Dios in connection with the scheme devised by a French engineer, M. Haag, to connect the above-mentioned river with an affluent of the Purus, itself one of the tributaries of the Amazons. The result of the various explorations was as follows:—On the east of the Eastern Cordilleras (Department of Cuzco), the rivers Pintpini, Pilcopata, and Tono take their rise. These rivers unite and form the river Madre de Dios, which receives the Inambari between 12° 30' S. latitude, and

73° 30' longitude west of Paris, and from this point it is thought that it would be possible for navigation to commence. The Madre de Dios then runs between the latitudes of 11° and 12°, as far as 69° 12' longitude of the same meridian, and 10° 50' latitude, where it meets the river Beni. It next flows through one degree of latitude before uniting with the Mamore, and after its confluence with that river it receives the name of Madeira. M. Ch. Gauthiot commented upon this last letter, and spoke of the communications which Bolivia and Peru were endeavouring to establish with Europe by the Atlantic Ocean. Bolivia, according to the treaty just signed, would find herself separated from the western coast, i. e. the Pacific Ocean. The Peruvian and Bolivian authorities were therefore seeking to stem the stream of commerce on the side of the great chain of mountains on the eastern slope, and to establish relations with the Upper Amazons.—M. Romanet du Caillaud called the attention of the members of the Society to two curious works on Tonking, which was a subject of great interest to France at the present time. One of the works was a Spanish book entitled 'Relaciones verdaderas del reyno de China, Cochinchina, por Don Pedro Ordoñez de Zevallos, Jaen. 1628.' It was known that the name of Cochinchina was that of Tonking during the 16th and 17th centuries. The copy, which M. Romanet du Caillaud had in his possession, belonged formerly to Colbert, one of the greatest ministers for the Colonies that France had ever had. The book bore a manuscript inscription as follows, "Ex bibliothecâ Colbertinâ," and was exceedingly rare. The other work referred to was published at the commencement of the present century, without the name of the author, under the title of 'Etat statistique du Tonkin, de la Cochinchine, du Champa et du Cambodge' (London 1811, Paris 1812, Galignani, 2 vol. 8vo.). This work was prepared by Montyon, the celebrated philanthropist, who made such a noble use of his wealth and instituted the prizes which the French Academy distributed every year. The book was founded upon documents collected by a French missionary, M. de la Bissachère. It was probable that the missionary, who was only used to speaking the Annamite language, had forgotten his French, hence the necessity of his recourse to a foreign pen.—The General Secretary then announced the opening at the Ethnographical Museum of the Trocadero of a new hall devoted to Europe. The halls reserved for America contained, it was stated, a more complete collection than those of other museums of the same kind. The part opened that morning would evidently not be so extensive, but it would nevertheless present features of real interest. Original national costumes were day by day disappearing in Europe, and all nations exhibited a tendency to adopt the same style of clothing. It was therefore important to collect together at once and to group specimens of ancient European manners.—M. René de Sémallé forwarded a number of the 'Manitoba,' a French paper published in St. Boniface, in the State of Manitoba, one of the territories around Hudson Bay, and forming at the present time a proper organised province in the Dominion of Canada. In the number transmitted to the Society there was an article by M. Elie Tassé, to which the correspondent called attention. The writer asks the two following questions: Whether Hudson Bay is covered with floating ice during the greater part of the year; and whether it is demonstrated that the icebergs, which come from the polar regions and render the entrance to the bay dangerous, absolutely preclude vessels from venturing there. If the solution of these questions was favourable, it would perhaps be possible to establish direct relations between England and the north-west of Canada by means of Hudson Bay. The writer stated that almost at that very time Mr. Royal, a member of the Canadian Federal Parliament, was proposing to the House the nomination of a Commission with a charge to study the question of the navigation of Hudson Bay. He relied on the fact that during a certain portion of the year the waters of the bay were as navigable as those of the St. Lawrence.

NEW BOOKS.

(By E. C. RYE, *Librarian B.G.S.*)

EUROPE.

Koch, [Prof. Dr.] Gustav Adolf.—Die Abgrenzung und Gliederung der Selvetta-Gruppe. Ein vorläufiger Beitrag zur allgemeinen Orographie der Nord-Rhätischen Alpen zwischen Rheintal, Aarbergbahn, und Engadin. Wien (Hölder): 1884, 8vo., pp. 42, map. (*Dulau: price 1s. 9d.*)

ASIA.

India: North-Western Provinces.—Statistical, Descriptive, and Historical Account of the North-Western Provinces of India. Vol. IX. Parts I., Sháhjahánpur, and II., Moradabad, by F. H. Fisher, B.A., Lond., Bengal Civil Service; Part III., Rámpur, compiled by Azim-ud-dín-Khan, General, Rámpur Native State, and edited by F. H. Fisher. Allahabad (North-Western Provinces and Oudh Government Press): 1883, large 8vo., pp. 102, 221, 52, and Indexes, pp. vi., vi., and iii., maps.

— The Himálayan Districts of the North-Western Provinces of India. By Edwin T. Atkinson, B.A., F.R.G.S. Vol. I. (forming Volume X. of the Gazetteer, N.-W. P.). Allahabad (North-Western Provinces and Oudh Government Press): 1882, large 8vo., pp. ix. and 946, maps and illustrations.

It had been intended to notice the second of the above-mentioned volumes (for both of which, as for the earlier part of the series, the Society is indebted to H.M. Secretary of State for India in Council), when the concluding portions of its separate subject were received; but as Vol. IX. of the Gazetteer has just come to hand, more than a year after this volume, which nevertheless forms a later one of the entire publication, it seems advisable to notice both as parts of a whole. An indication is now given of the scheme of the Gazetteer: Vols. I.–VI. have already been noticed in our ‘Proceedings’ for 1882, pp. 388 and 389; Vols. VII. (Farukhabad, Agra, and Jalesar tahsil), VIII. (Muttra, Allahabad, and Fatehpur), XI. and XII. (concluding the Himálayan Districts, of which they will form Vols. II. and III), XIII. (Azamgarh, Gházipur, and Ballia), and XIV. (Benares, Mirzapur, and Jaunpur) apparently remain to be published, Vols. IX. and X. being now under consideration.

Vol. IX. is practically drawn up on the lines of preceding District notices, its three separate parts being subdivided under four heads:—1, Geographical and Descriptive; 2, Animal, Vegetable, and Mineral Products; 3, Inhabitants, Institutions, and History; 4, a Gazetteer, alphabetically arranged,—a separate Index affording ready reference to each. Zoology and botany, especially in their economic aspects, receive special attention; and the best scientific authorities are freely quoted or referred to with reference to them; there is also a considerable amount of interesting matter upon the subject of native industries. The Rámpur record is naturally short, as being that of a native State of very modern origin.

The commencement of Mr. Atkinson's work on the Himálayas, forming Vol. X., is naturally of far greater geographical importance and general interest. The original plan of this Memoir included a thorough examination of the country between the Tons and the Káli, with a less detailed summary of our knowledge of the Himálaya-Tibetan region; but this extended idea has now been reluctantly abandoned, and all that will be published refers to the Himalayan districts of the North-Western Provinces, including the British districts of Kumaon, Garhwál, Taráí, Dehra-Dún, and Jaunsár-Báwar, and the Independent State of Tihri or foreign Garhwál, comprising the tract within the Himálaya bounded by the Tons on the west and the Kali or Sárda on the east; the adjoining portion of Tibet to which British subjects resort for trade or to visit the

sacred lakes is also considered within the scope of the work. The present volume commences with an introductory chapter in which the views of our past and present greatest authorities on the systematic geography of the Himálaya are sketched and discussed separately, with an ethnical and political outline of the tribes from Upper Asám on the east to the Galcha States of Badakshán on the west, and more briefly of the northern Kára-Kurchins, Kára-Tangutans, and Tibetans on the north. This portion is followed (pp. 42-60) by a bibliography of the geographical and ethnological subjects noticed, localised by sections, and subdivided. The Physical Geography, Geology, mountain system and structure, Meteorology, Economic Mineralogy (with bibliography), and Scientific and Economic Botany are then severally treated, all at considerable length and very fully as regards the two latter subjects, which with their bibliography and the Forest statistics occupy two-thirds of the volume.

The maps are of the Himálayan-Tibetan region generally, and of Kumaon and the adjoining part of Tibet; there is also a geological map of the country between the Satlaj and the Sárde. The illustrations represent the Pindar and Kuphini glaciers.

AFRICA.

Neuville, D., & Bréard, Ch.—*Les Voyages de Savorgnan de Brazza, Ogdoué et Congo (1875-1882)*. Paris (Berger-Levrault): 1884, large 8vo., pp. xxi. and 303, map and portrait. (*Dulau*: price 5s.)

This work will chiefly be of use as giving in a collected form the reports, &c., of M. de Brazza, in connection with his recent operations on the north of the Congo, though it also includes a similar treatment of his first explorations on the Ogowai. It is, however, largely made up of commercial, political, and missionary matters, and will not interfere with any eventual more extended publication of a purely geographical nature by the traveller. Of him, no introductory account is given; it may therefore not be out of place to note that in the earliest detailed publication of his work in our library, a communication of letters from him by Monsignor Francesco Nardi to the Pontifical Academy in 1876, his name is given as the Conte Pietro di Brazza-Savorgnan, and the year of his birth as 1852.

The present volume is divided (after a somewhat lengthy introduction, of which French commerce in Western Africa forms the chief topic) into three chapters, of which the first contains the official instructions, letters, reports, and notes referring to the Ogowai voyage; the second, various extracts of reports on the Gaboon, the Congo, &c., the report of M. Mizon to the French Committee of the International African Association, and, finally, two reports by M. de Brazza on his Congo work; the third discusses the various English and French Missionary voyages to the Congo, reprinting the account by Pere Augouard in the 'Missions Catholiques' of his visit to Stanley Pool, and translating Mr. Bentley's account from the 'Missionary Herald,' August 1881.

The map accompanying this volume (scale 1:1,000,000) covers the Ogowai basin and the Congo from its mouth to the equator, with an inset of the Gaboon, and is borrowed from the Paris Geographical Society.

AMERICA.

Bell, Charles Napier.—*Our Northern Waters; a Report presented to the Winnipeg Board of Trade regarding the Hudson's Bay and Strait, being a statement of their Resources in Minerals, Fisheries, Timber, Furs, Game, and other products. Also notes on the navigation of these waters, together with Historical Events and Meteorological and Climatic Data.* Published by authority of the Winnipeg Board of Trade (J. E. Steen, Printer, Winnipeg): [1884] 8vo., pp. 78, maps.

The very full title sufficiently indicates the nature of Dr. Bell's work, the maps accompanying which are the usual official general one of the Dominion, and another (loose) showing the proposed route of the Manitoba and Hudson's Bay Railway. Plans are also given of Churchill Harbour (1 inch to the mile), and of the mouths of the Nelson and Hayes rivers (2 miles to the inch).

Crawford, Robert.—*Across the Pampas and the Andes.* London (Longmans, Green, & Co.): 1884, post 8vo., pp. xxii. and 344, map and illustrations. Price 7s. 6d.

The author was engineer-in-chief of the staff employed upon the exploration and survey of the route for the proposed Trans-Andine railway, and bases his work upon the diary kept during the preliminary operations in 1871 and 1872. After an account of Uruguay, Entré Ríos, and Buenos Ayres, the route via Chivilcoy, Bragado, the Indian Toldos, and across the old Argentine frontier to Indian territory is described, up to the stoppage of the survey owing to Indian invasions, when the expedition took refuge in Fort Media Luna. From that point, the party pushed westwards by Amarga and the river Quinto to Mercedes, San Luis, and Mendoza, then turning southwards among the foot-hills of the Andes, to the valley of the Río Grande, and finally crossing into Chili by the Planchon Pass. The narrative is full of personal incident and topographical information, being also well illustrated by the author's sketches, engraved by Whymper. In the appendix, the peaks and passes of the Andes are described at some length, eighteen of the latter being separately treated. A chapter is also devoted to a sketch of the geographical position and extent of the Argentine Republic, and another to Indian frontiers and invasions, the work concluding with a discussion of the La Plata colonies, and the existing and projected railways. The map (58 miles to the inch) shows the routes of the expedition and the railways.

Verteuil, L. A. A. de.—*Trinidad: its Geography, Natural Resources, Administration, Present Condition, and Prospects.* Second edition. London (Cassell & Co.): 1884, 8vo., pp. xi. and 484 [no index], map. Price 21s.

This standard authority was first published by Ward and Lock in 1858. The present edition is strictly upon the lines of its predecessor, with the addition of a map (scale 4 miles to the inch) and some observations on minerals arising from the survey of Wall and Sawkins, &c., and the omission of some old local matter. The zoology, &c., is discussed in considerable detail, but there is no attempt at working this scientific portion up to date, the numerous papers and descriptions by Lechmere Guppy, Finsch, and other naturalists being apparently ignored.

GENERAL.

Löwl, [Dr.] Ferdinand.—*Ueber Thalbildung.* Prag (H. Dominicus): 1864, 8vo., pp. 136, illustrations. (*Dulau*: price 3s.)

Sigismund [Dr.] Reinhold.—*Die Aromata in ihrer Bedeutung für Religion, Sitten, Gebräuche, Handel, und Geographie des Alterthums, bis zu den ersten Jahrhunderten unserer Zeitrechnung.* Leipzig (Winter): 1884, 8vo., pp. vi. and 234 [no index or table of contents]. (*Dulau*: price 3s.)

By the geographical influence of spices in ancient times, the author more particularly refers to the early knowledge of remote Asian and African countries to which the western nations were indebted for those valuable products, the search for which added materially to the then existing geographical information.

Supan, [Prof.] Alexander.—*Grundzüge der physischen Erdkunde.* Leipzig (Veit): 1884, 8vo., pp. xii. and 492, coloured maps, illustrations. (*Dulau*: price 9s.)

Walker, Robert.—*The Five Threes—33,333 miles by Land and Sea. Holiday Notes.* London (Hamilton, Adams, & Co.): 1884, 8vo., pp. 264, frontispiece. Price 6s.

Personal incidents of travel to Melbourne, Victoria, New South Wales, Fiji, New Zealand, Tasmania, Hawaii, and California.

NEW MAPS.

(By J. COLES, *Map Curator R.G.S.*)

EUROPE.

Deutschland, den Niederlanden, Belgien und der Schweiz, Post- und Eisenbahn-Karte von—: bearbeitet nach L. Friedrich's Post- Eisenbahn- und Reise-Karte von Mittel-Europa. Redigirt von C. Vogel. Scale, 1 : 1,800,000, or 24·6 geographical miles to an inch. Justus Perthes, Gotha. Price 1s. (*Dulau.*)

Italia, Carta d'—. Scales 1 : 50,000, or 1·4 inches to a geographical mile, and 1 : 25,000, or 2·9 inches to a geographical mile. Istituto Topografico Militare, Firenze, 1883. Sheets 27 (1 : 50,000) Monte Bianco. 112 I. N.O. (1 : 25,000) Palaja, I. N.E. Castelnovo, I. S.O. Peccioli, I. S.E. Montajone; IV. N.O. Colle Salvetti, IV. N.E. Pontedera, IV. S.E. Lari. Price 7d. each sheet. (*Dulau.*)

Mykenai, Karten von—. Auf Veranlassung des Kaiserlich Deutschen Archäologischen Instituts, aufgenommen und mit erläuterndem Text herausgegeben von Steffen Hauptmann und Batterie-Chef im Hessischen Feld-Artillerie-Regiment No. 11. Zwei Blätter: Mykenai mit Umgebung, 1 : 12,500—Akropolis von Mykenai, 1 : 750. Nebst erläuterndem Text von Steffen und H. Lolling. Dietrich Reimer, Berlin, 1884. Price 12s. (*Williams & Norgate.*)

Oesterreich-Ungarn, Eisenbahn-Karte von—. Scale 1 : 800,000, or 10·9 geographical miles to an inch. Hölzel, Wien. Price 2s. (*Dulau.*)

ASIA.

Indian Government Surveys:—

Rainfall Chart of India showing the average annual distribution of the rainfall according to locality and season. Compiled for the Government of India by Henry F. Blanford, F.R.S., Meteorological Reporter to the Government of India, Calcutta 1868. 64 miles to an inch. 2 sheets.—**Bombay Presidency:—** Trigonometrical Branch, Survey of India. Guzerat, Sheet 33, Section 2 (Seasons 1879-80 and 1880-81). Part of the Mándvi Táluka of the Surat Collectorate. Sheet 33, Section 4 (Seasons 1879-80 and 1880-81). Part of the Mándvi Táluka of the Surat Collectorate. 2 inches to a mile.—Trigonometrical Branch, Survey of India. Section No. 2 of Sheet No. 49 of Guzerat (Dáng Forests). Parts of the Dáng Gárvi, and Dáng Derbhavti States. Seasons 1878-79 and 1880-81. Section No. 7 of Sheet No. 49 of Guzerat (Dáng Forests), 2nd edition. Parts of the Dáng Derbhavti, Dang Shivbára, Dáng Garvi, and Dáng Kirli States. Seasons 1880-81 and 1881-82. Section No. 16 of Sheet No. 49 of Guzerat (Dáng Forests). Parts of the Dáng Chinchligadad, Dáng Archar, Dáng Jhári Gárhadi, Dáng Derbhavti, Dáng Vádhan States and of the Gáikwár's Territory. Season 1881-82. 4 inches to 1 mile.—Trigonometrical Branch, Survey of India. Sheet No. 5 of Káthiáwár (2nd edition). Parts of Ahmedabad and Gohelvád. Season 1868-69. Sheet No. 8 of Káthiáwár (2nd edition). Part of Gohelvád. Seasons 1866-67 and 67-68. Sheet No. 30 of Kattywar [Káthiáwár]. Part of Soruth. Seasons 1870-71 and 71-72. 1 mile to an inch.—**Bengal Presidency: Oudh Revenue Survey.** Sheet No. 146. District Bahraich. Seasons 1865 to 68. Sheet No. 153. Districts Partabgarh and Rae Bareli. Seasons 1859 to 61. 1 inch to a mile.—North-West Provinces Survey. 1 inch to a mile.

Sheet No. 31 (East). District Moradabad. Seasons 1873-74 and 1876-77. No. 33 (Eastern portion). Districts Moradabad and Budaun. Seasons 1872-73 and 76-77. No. 47. Districts Moradabad, Bijnor, Tarai and Rampur State. Seasons 1864-5, 1868-9, and 1871 to 76. No. 48. District Moradabad and Rampur State. Seasons 1871-2 and 75-76. No. 50. Districts Moradabad, Budaun, and Rampur State. Seasons 1872-73-74 and 76-77. No. 51. District Buduan. Season 1876-77. No. 52. District Budaun. Seasons 1876-77-78. No. 68. District Budaun. Seasons 1876-77 and 78. No. 69. District Budaun. Season 1877-78. No. 84. District Budaun. Season 1877-78. No. 109. District Banda. Seasons 1874 to 76. No. 140. District Banda. Season 1875-6.—**Trans-Frontier Maps; Afghanistan.** General Map on the quarter-inch scale (4 miles to an inch). 4 sheets. Preliminary issue. 1883.—Northern Afghanistan. Sheet No. 9. 2 miles to an inch. 1883.—Map of the Hakim's Explorations in Afghanistan 1883. 4 miles to an inch. 1883.—Map of Passes from Bannu into North Waziristan. 2 miles to an inch. 1883.—Biluchistan Topographical Survey. 2 miles to an inch. Part of Half Degree Sheet X, South. (Preliminary issue). Katch Gandara. Seasons 1880-81. Degree Sheet No. XVI. s.e. Country N. and N.E. of Kelat. Seasons 1881-82-83.—Trigonometrical Branch, Survey of India. Sketch Map of Routes traversed by European and Asiatic Explorers beyond the British Frontier in connection with the operations of the Trigonometrical Branch, Survey of India from 1865 to 1883. 64 miles to an inch.

AMERICA.

Brazil.—Companhia geral de estrados ferro brasileiras. Mappa geral mostrando a estrada de ferro de Paranaguá a Corityba e seu prolongamento até á foz do Rio Ignassú, nos limites do imperio com as republicas Argentina e do Paraguay. 1883. Paris, Chaix. (*Dulau.*)

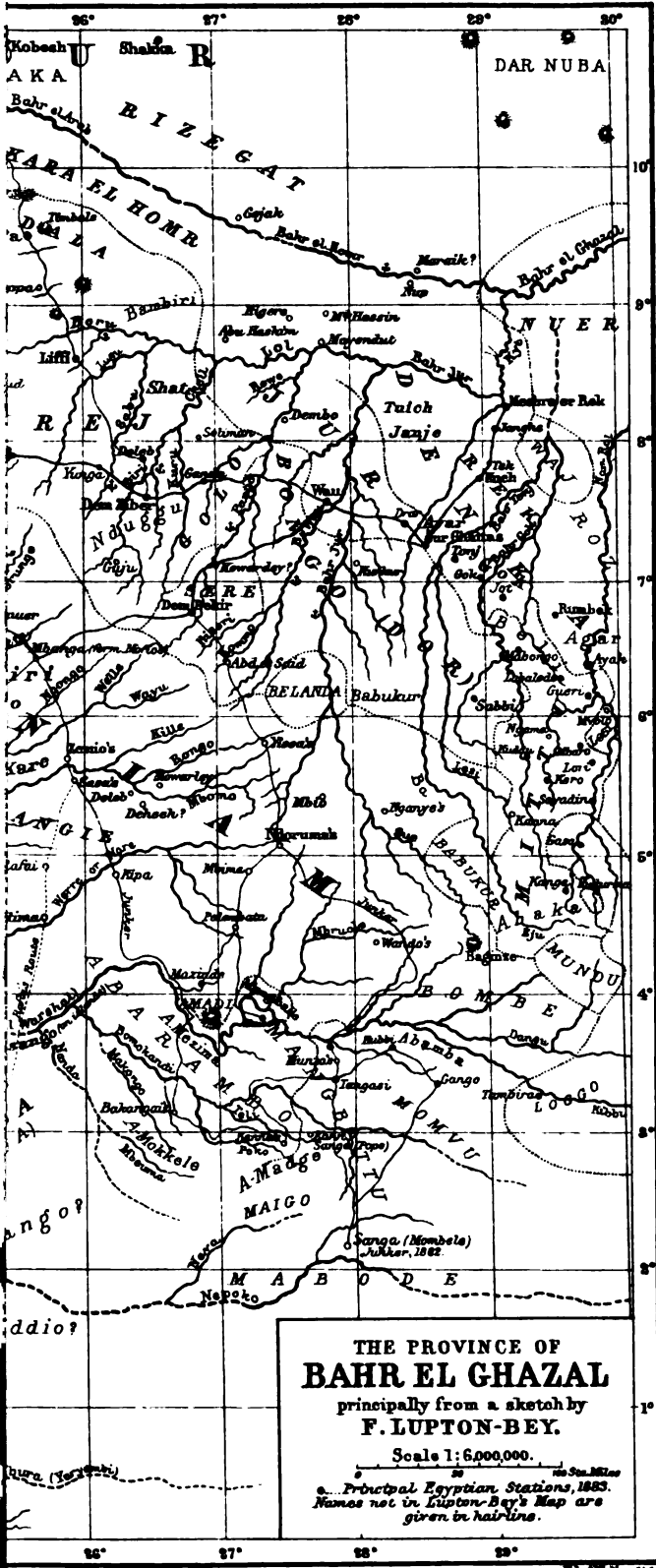
— Mappa geral de sul do imperio do—, e das republicas do Paraguay oriental e parte da Argentina, mostrando o systema de viação ferrea existente e em projecto. Scale 1 : 4,000,000, or 55·5 geographical miles to an inch. Paris, Chaix, 1883. (*Dulau.*)

Greenland.—Karta öfver Konung Oscars Hamn pa Grönlands Ostkust. Upprättet under expeditionen med Sofia 1883 af C. J. O. Kjellström. Scale 1 : 100,000, or 1·3 geographical miles to an inch.

CHARTS.

Dépôt des Cartes et Plans de la Marine.—No. 3968. Plan de l'Embouchure de la Seine (Environs du Havre), 1883.—3963. Côte Ouest de France. Gironde. Rades du Lazaret et de Pauillac. 1883.—3967. Côte Sud de France. Baie de Marseille. Iles Pomègues et Ratoneau. 1883.—3849. Mer Méditerranée. Tunisie. De la Galite au Cap Bon. 1881. Corrections essentielles en Août 1882, Oct. 1882, Oct. 1883.—3944. Golfe du Tong-Kin. Côtes du Tong-Kin et de la Chine. Entre la Cac-Ba et Pak-Hoi. 1883.—3933. Océan Pacifique Sud. Ile Wallis ou Ile Uvea. 1883.—3935—Océan Pacifique. Iles Marquises. Ile Ua-Pu. 1883.—3962. Océan Pacifique. Iles Marquises. Ile Fatu-Hiva (Madeleine). 1883.—3931. Océan Pacifique Sud. Archipel des Marquises. Ile Nuku-Hiva. 1883. Dépôt des Cartes et Plans de la Marine, Paris.

North Atlantic Ocean.—Pilot Chart of the—. No. 4, March 1884. No. 5, April 1884. Equatorial scale, 3·7 degrees to an inch. Prepared by order of the Bureau of Navigation; Commander J. R. Bartlett, u.s.n., Hydrographer, U.S. Hydrographic Office, Washington D.C. With supplement.



W. A. R. :
Stanto di J.
W. H. H. S. T. Y.

PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

*Notes on the Physical and Historical Geography of Asia Minor,
made during Journeys in 1879-82.*

By Colonel Sir CHARLES W. WILSON, R.E., K.C.M.G.

(Read at the Evening Meeting, March 24th, 1884.)

Map, p. 364.

IN March 1879, Her Majesty's Government decided to establish military Consulates in Asia Minor to watch the introduction of reforms under the Anglo-Turkish Convention. I had the honour to be selected to fill the post of Consul-General, and the officers appointed to serve with me at various periods were Major, now Lieut.-Colonel Warlow, Madras Staff Corps; Captain, now Lieut.-Colonel Stewart, C.M.G., 11th Hussars; Captain, now Major Cooper, 47th Regt.; Lieut., now Major Chermiside, C.M.G., R.E., and Lieuts., now Captains Bennet and Kitchener, R.E.

Our mission was a political one, but we were determined to bring back as much information as we could of a country at once so interesting and so little known. The geographical results, which more especially concern this Society, were briefly,—a complete military survey of the Taurus range from the mountains of Lycia to the Persian frontier; of the Anti-Taurus; and of the Giaour Dagh, or Mount Amanus, from the Taurus to the Beilan Pass. Surveys were also made of the Cilician plain; of the country round Mount Argæus; of portions of Paphlagonia and Pontus; and every important road in the country was examined and sketched. Many of the sketches are very beautifully executed, and reflect the highest credit on the officers who made them under circumstances of considerable difficulty.

The country to which we were accredited was called in our commissions Anatolia, a term which conveniently describes all Asia Minor west of the Anti-Taurus. The Turks give a wider signification to the name; they acknowledge four great divisions of their Asiatic territory—Anatolia, Syria, Mesopotamia, and Arabia; and of these the first includes

the whole country, north of the Taurus, from the Ægean to the Persian and Russian frontiers. Anatolia in its narrower sense is known to those who live in it as Rûm; a name, only recognised officially as that of a small administrative district in the Anti-Taurus, which shows the deep and lasting impression left on the minds of the people by the grandeur of the old Seljûkian kingdom of Rûm.

The remarkable position of Rûm, or Anatolia, surrounded on three sides by water, and stretching out as it were a many-fingered hand from Asia towards Europe, has had an important influence on its history. The near approach of the Asiatic and European shores at the Bosphorus and the Dardanelles, and the numerous islands which stud the Ægean, afford peculiar facilities for communication between the two continents which must have been utilised at a very remote period. The earliest roads to the far East passed through Anatolia, and we are only beginning to realise the influence which the religion and art of its early inhabitants exercised upon those of the ancient Greeks.

The intimate connection between the history and geography of Anatolia is a subject of extreme interest, but, from want of time, I am unable to enter upon it on the present occasion. I should wish, however, to draw your attention for a few moments to the ancient trade-routes. There is one easy natural approach to the Anatolian plateau, and one only; it is that which leads up the valley of the Mæander to its junction with the Lycus, and then up the valley of the Lycus, through Colossæ (Khonas) and past the Salt Lake, Choruk Gûl, to Apameia-Celæna (Dineir) and the sources of the Mæander. Thus far the country is open, the slopes are gradual, and there are no difficulties; from Dineir there is a short, sharp ascent, and then the great table-land stretches away to the foot of Anti-Taurus. This natural highway was used by Phrygian traders; the armies of Xerxes and Cyrus followed it; the Romans brought the great blocks of Docimian marble over it to the coast; and it is now the route which has been selected for the extension of the Aidin Railway. Its outlet was first Miletus, then Ephesus, and, when the ports of these places were closed, Smyrna, which, if timely steps are not taken to avert the danger, will itself be shut off from the sea by the rapidly advancing silts of the Hermus.

This, however, was not the first trade-route in Anatolia; in early Greek history the produce of the East found an outlet at Sinope, the only good natural harbour on the north coast. This was due partly to geographical, partly to political causes; the principal river of the country, the Halys (Kizil Irmak), appears always to have been a boundary river, and the political and commercial centre of the kingdom to the east was Pteria (Boghaz Keui). The earliest road, therefore, was that which, entering Anatolia by the Cilician Gates, passed through Mazaca (Kaisarich) to Pteria, and thence to the nearest natural outlet Sinope. The Persian royal road, which passed through Phrygia, dates from the

time when Pteria and Sardis were the two chief cities of Anatolia. When, however, the former disappeared from history and the latter ceased to be a capital, trade flowed along the more natural route, and Apameia-Celœnæ and Mazaca-Cæsareia became the chief emporia. At a later period, after the foundation of Constantinople, a new road system became necessary; all the great lines of communication, as described in the Antonine itineraries, led to the capital; Apameia, notwithstanding its favourable position, declined, but Cæsareia retained its importance. When the Seljûks founded their empire of Rûm, with its capital at Iconium (Koniëh), another change took place,—the western outlets were, to a certain extent, barred by the Greeks, and commerce flowed to Adalia and the south coast, where an active trade was carried on by the Venetians and Genoese; the fortunes of Cæsareia began to wane, and Nigdeh, Karamân, and Koniëh rose to importance. After the capture of Constantinople by the Ottoman Turks, the old lines of communication again came into use, and Cæsareia (Kaisariëh) regained its position; so important, however, was Koniëh considered, that for a long time trade followed that direction, and even now the post from Constantinople to Aleppo passes through Koniëh. A last change has taken place in the present century; Smyrna has become the principal port of Anatolia, and as the Aidin Railway is pushed forward, Apameia will regain something of its former importance. A very admirable paper on the ancient roads, by Mr. W. M. Ramsay,* who accompanied me on two long journeys in Anatolia, will be found in the 'Journal of the Royal Asiatic Society' for 1883; to this I am indebted for many of the above remarks.

I may here indicate two subjects for investigation which have hitherto received little attention—the Seljûkian kingdom of Rûm, and the Venetian occupation of the south coast of Anatolia. Nothing made a deeper impression upon my mind than the evidence which the Seljûks have left in the country of their power and cultivation. Their castles, their bridges, their khans, and their roads have something Roman in their solidity; and the beauty of their mosques, minarets, and tombs is only equalled by that of the best Arab buildings at Cairo. Their art bears traces of Persian influence; animal and even human figures are freely used in decorative details; and in many of their minarets there is a very effective combination of coloured tiles and brick. From Adalia to Mersina there are numerous traces of the Venetian settlements; the Venetians appear to have followed the old Greek system of colonisation, occupying strong positions on or near the coast, and holding the rich valleys and coast plains. From the enormous number of ruins, the colonisation must have been on an extensive scale, and for many miles

* In a letter dated 16th April, 1884, Mr. Ramsay says that with the Consular Surveys and the work of this summer he will "be able to fix the ancient map of almost all the plateau next winter, with the boundaries of Roman and Byzantine provinces and of Byzantine dioceses."

the traveller rides past terraced hills thickly covered with wild olive and carob trees, which show the existence of a period of civilisation which has long since passed away. The country is now peopled only by wandering Yûrûks, and, as far as I am aware, there is no historical record of the Venetian occupation.

Anatolia may be briefly described as an elevated plateau which rises gradually from about 2500 feet on the west to some 4500 feet on the east, near the foot of the Anti-Taurus Mountains. On the south the plateau is supported, or buttressed, by the Taurus range, which in some places rises little above the level of the plateau, but in others, as in the mountains of Lycia and the Bûlghar Dagh, attains a considerable altitude, 7000 feet to 8000 feet; the north side is similarly buttressed by a range of varying altitude, which has no distinctive name. On the west the edge of the plateau is much broken by numerous broad valleys, and is of no great height except near the Sea of Marmora, where the range of the Mysian Olympus rises far above the general level; on the east the Anti-Taurus supports a higher plateau, which extends eastwards towards Erzerûm. This last plateau also rises from west to east, and is equally supported on the south by the Taurus, which ever attains a higher altitude, as it proceeds eastward, until it culminates in the lofty snow-clad mountains on the Persian frontier. Here and there minor ranges, such as the Phrygian Mountains and the Sûltan Dagh, south of the road from Afîûm Karahissar to Konieh, rise above the level of the Anatolian plateau; and there are several remarkable mountains of volcanic origin, of which Mount Argæus, 13,100 feet high, is the loftiest and best known. A large portion of the plateau is, however, almost level, and the central district is occupied by a great treeless plain of the most dreary and uninviting character.

The valleys on the plateau are as a rule broad and open, but on approaching the coast-line the rivers find their way to the sea, either through deep, almost inaccessible gorges, or through wide trough-like valleys, such as those of the Hermus and Mæander on the west coast. In the central and southern portion of the plateau, however, the streams do not reach the sea; some of them are lost in salt lakes, whilst others supply fresh-water lakes, whose waters find their way beneath the Taurus to reappear as noble streams to feed the rivers on the south coast. The waters which pour, during the winter months, into the Tûz Gûl in the centre of the plateau, and into the Bûldûr and other smaller lakes, pass off by evaporation during summer, and leave thick deposits of salt behind them. The waters of the Eregli Lake reappear south of the Taurus as the sources of the Cydnus; whilst those of the Bayshehr and Egirdir Lakes, after a subterranean journey, swell the volume of the Melas (Menavgat Chai) and Eurymedon (Keupru-su). The places where these underground streams disappear and reappear are locally called "Dudens"; one good example is that of the Eregli Lake, where, in 1879,

I found a stream running into a sort of punch-bowl in the hills. On a second visit to the same place in 1882, the lake was little more than a marsh; and the bottom of the punch-bowl, in which there was no trace of an opening, was dry. Another instance is that of the Duden-su (Cataractes), which issues silently from a picturesque hollow, and flows onwards to pour over the rocks east of Adalia in the series of cataracts which gave the river its ancient name.

The number of large springs in the mountain districts of Anatolia is one of the peculiar features of the country, and one of its greatest charms. After travelling for days over the waterless plain, nothing is more grateful than the sight of the clear waters bursting from the ground and running away down some wild rocky ravine, or through the midst of the most luxuriant vegetation. There are also many hot springs, marked by the ruins of Roman baths, which are still used by the Anatolians for various disorders. They are found in every district, and during the summer are much visited; those of Brûsa, frequented by people from Constantinople, are best known, but Smyrna, Angora, Konieh, Kaisarîch, and Sivas have each their special hot springs. At Tâzla, north-west of Assos, there is a remarkable salt spring of boiling water, in which the villagers often cook their food; and at several places there are mineral springs which have a great local reputation; one near Afîûm Karahissar, which will some day become a valuable property, gives water that tastes very much like German seltzer.

The climate of Anatolia is influenced by the geographical position of the country as well as by its varying altitude. On the plateau it is like that of the New England States in America; cold in winter, the thermometer falling several degrees below zero, and hot in summer. On the north coast the winter is cold, with much rain and heavy falls of snow, whilst in summer the damp heat is sometimes very trying; on the south coast the winter is, as a rule, delightful, but the summer extremely hot. There are a few peculiarities in the climate which may be briefly noticed. As the country has water on three sides of it, there are, in summer, three sea-breezes, from the north, west, and south; they rise about 9 in the morning, and blow steadily till sunset. These opposing winds produce a calm belt, of varying width, in the centre of the plateau—the Doldrums of Anatolia, in which the intense heat is only relieved by the weekly thunderstorms, which occur with almost unvarying regularity. In winter the prevailing winds are from the north; they come across the Black Sea from the plains of Southern Russia, and are intensely cold; they are accompanied by torrents of rain and heavy falls of snow which accumulates on the edge of the plateau to a depth of 15 feet to 20 feet. Eastward of Samsûn the climate is more moderate, as the coast is protected from the north wind by the Caucasus. The break-up of the winter on the plateau is marked by the advent of a strong southerly gale, and is accompanied by some curious phenomena. The south wind is very

dry, and produces rapid evaporation; it quickly thaws the snow, and produces such an intense feeling of cold as to justify the Anatolian saying that "the south wind is fire to snow and ice to man." Whilst travelling in the spring of 1880, I had an opportunity of witnessing the way in which the snow disappears. The mornings were perfectly clear, but gradually as the sun and wind rose, clouds could be seen forming in the sky; as the day wore on, the clouds collected, and about two hours before sunset rain began to fall; this again, as the air became chilled, after the sun went down, turned into snow; about 10 P.M. the sky became perfectly clear, and a sharp frost set in until the following morning. This went on for four or five days, by which time the snow had almost entirely disappeared.

The vegetation varies with the climate. From Brûsa along the north coast to the new Russian frontier, where the influence of the moisture-laden winds of the Black Sea is felt, the mountains are clothed with magnificent forests, and the effect of the protecting range of the Caucasus is shown in the sub-tropical vegetation of the valleys near Trebizonde. On the south coast the forests are smaller, and the variety of foliage is much less; whilst on the plateau large trees are only found where streams issue from the mountains. In the central district there is little vegetation, and the great summer heat and uncertain rainfall make agricultural operations precarious.

The agricultural and mineral wealth of Anatolia would, if properly developed, be enormous; except in America, I have never seen such excellent land for wheat, and there is probably no country which produces such a variety of good fruit; Amasia apples and Angora pears, both derived from English stocks, can hardly be surpassed; whilst the cultivation of vine, olive, and fig on the western and southern coasts, might be increased to an unlimited extent. Many districts are favourable to the production of silk, cotton, rice, opium, liquorice, tobacco, madder, gum tragacanth, yellow berries, the valonia oak, the carob-tree, &c.

The hill-sides provide pasture for immense numbers of goats, including the Angora mohair goat, and sheep; whilst camels and a hardy breed of horses are raised on the upland plains.

Amongst the minerals are gold, silver, lead, iron, coal, boracide, chrome, fullers' earth, rock salt, kaolin, and meerschaum; large quantities of salt are obtained, by evaporation, from the salt lakes and the sea; and serpentine and fine marbles are found in many districts.

With its magnificent seaboard, and its agricultural and mineral wealth, Anatolia should be one of the most prosperous countries in the world; its present miserable condition is due to centuries of misgovernment, but a time will come when its resources will again be developed, and it will then take the lead amongst the countries in the Levant.

The people of Anatolia are well deserving of careful study; it may

surprise those who have not paid much attention to the subject to hear that, with the exception of the nomads, there are few Turks or persons of Turkish origin in the country. The settled population on the whole represents the indigenous race, or races, which appear to have possessed great powers of absorption or assimilation. The Moslems are the descendants of those who adopted Islam at, or soon after, the period of the conquest, whilst the Christians are the descendants of those who retained their religion. There are of course many exceptions to this rule, such as the Greeks on the west coast, and the Armenian colonies near Isnik, Brûsa, Angora, and Afîm Karahissar. The types are, however, generally well marked, and it is possible, for an experienced person, to tell within certain limits the district from which a man comes; no one, for instance, could well mistake a Galatian, with his light brown hair and blue or grey eyes, for a Cappadocian with his dark hair, thin face, and peculiar nose. One peculiarity the entire population seems to have in common; the young men leave their homes, and go off to earn sufficient money to return and marry, and certain villages seem always to supply the same trades; thus the *sarafs* or money-changers, at Constantinople, come from Egin; the Sultan's servants, from some villages on the Kizil Irmak near Nevshêhr; the small store-keepers at Constantinople, from the villages north-west of Nigdeh; the boatmen who so skilfully manage the *caïks* on the Bosphorus, from Sivas and the Armenian table-land; the *hammals* or porters, from the Kaisarieh district; the butchers at Aleppo, from Van and Bitlis, &c. In harvest time there is also a great movement; in the fig season, Smyrna is thronged by peasants from the mountains of Pisidia, and the crops on the great Cilician plain are gathered by a motley crowd of men, women, and children, who come each year from Diarbekir and the mountains of Kûrdistân.

There is amongst Anatolians the broad distinction of Christian and Moslem, and of the former the Greeks demand the first attention. They are most numerous on the sea-coast, but throughout the country there are groups of villages and isolated communities of people, called Greeks because they belong to the Greek Church, but really of Pontic or Cappadocian origin. On the west coast a remarkable movement has been going on for the last twenty-five years, which has resulted in the almost entire displacement of the Moslem population by Greek colonists from the Turkish islands of the Archipelago. One result of the Greek war of independence was increased security to life and property in the islands; under these conditions the population rapidly became too large for the soil to support, and the necessary emigration found a natural outlet in the rich coast plains and fertile valleys of Western Anatolia. Every year the islands send out fresh emigrants; the coast districts from Assos to Scala Nuova are now almost entirely owned by Greeks, and the rich lands in the valleys of the Mæander and Hermus are gradually passing

into the hands of the Christian. At Adalia there is an interesting Greek colony which is Jewish in dress and appearance, and is perhaps of Jewish descent: the people have several curious ceremonies, of which I may mention here that the bride is dragged to her marriage, with apparent unwillingness, by her two best ladies; and that on the wedding day she sits in an artificial bower with a plate in front of her, into which every visitor is expected to throw a gold coin. Between Sivas and Samstn there is a considerable Greek population, living in the mountains, which appears to be of Pontic descent: the people are rough and uncivilised, but hospitable to European visitors, and they have retained their language. Kaisarieh and the villages in its vicinity have a well-to-do population of Cappadocian Greeks; but perhaps the most interesting communities are those living in the subterranean villages beneath the plain north-west of Nigdeh. The features of these people have a striking family resemblance to the faces on the Hittite monuments, and it is not unlikely that we have in this instance a remnant of the old race which, owing to local accidents, has preserved its type in a pure form. The villages were described in a note sent to the *Athenæum* in 1882. The isolated villages are generally found near mines, and it seems clear that in these cases the villagers were allowed to retain their language and religion on condition that they worked the mines for the Turks. The language spoken by these isolated communities and also by the Pontic Greeks differs so much from modern Greek that a man from the west coast finds at first some difficulty in understanding it. A study of these dialects would be interesting, as in them, if anywhere, we may expect to find words belonging to the ancient language of the country.

The Armenians are most numerous in the vilayet of Sivas; but there are large settlements near Isnik, Brûsa, and Afîm Karahissar descended from colonies forcibly planted in those places by the Seljûk and Ottoman Turks. In Angora there is a large Roman Catholic Armenian community, a large proportion of which came from Armenia during the present century. The Armenians present more than one variety of type; and the difference between the Armenian mountaineer of the Taurus and Giaour Dagh and the Armenian of the Anatolian towns on the plateau is most striking. The Armenians carry on much of the commerce of Anatolia, and they are equally successful as large merchants or small pedlars. The extent of some of their operations may be gathered from the fact that one merchant at Sivas sends his agents to Bokhâra, Samarcand, and the remotest towns of Central Asia; the men are sometimes away for three or four years, and generally return with a handsome profit on their venture. The system is not unlike that which seems to have prevailed in the Middle Ages, when merchants made long and perilous land journeys which lasted for several years. The Armenians of the Bozûk, as the country round Yûzgat is called, are great camel breeders, and they and the Turkomans breed the fine Tûlû camels

which are so much admired, by the passing traveller, on the quays at Smyrna. The Tûlû is a cross between a Bactrian, two-humped, father and a Syrian mother; he has one hump, like his mother, but in other respects, especially the fine head and abundant beard, follows his father. The Tûlû is invaluable in Anatolia as he works in mud and snow, which would soon kill the Syrian camel; he cannot, however, stand great heat, and in summer he is taken off to the plateau, and is replaced on the coast by the Syrian camel. The Armenians often make long journeys to Turkestân or Tiflis in search of good Bactrian stock; and in the breeding season the males are sent round from village to village, as stallions are in this country.

The sedentary Moslem population belongs, as previously stated, to the indigenous races; the people are hardy, brave, and hospitable, but entirely without education, and they follow in their agricultural pursuits and domestic architecture the methods employed by their ancestors 2000 years ago. In some villages the men are evidently of Armenian or Greek origin, and even retain Greek and Armenian family names. A large proportion of the peasantry is Kizilbash, a title given to those who are supposed to be Shi'as; I believe, however, that, in Anatolia at least, the religion of these people is rather a mixture of the Shi'a and Ansariyeh beliefs than the pure Shi'a belief of Persia. At any rate, such is the case with the compact Kizilbash population, which stretches from Boghaz Keui (Pteria) eastward to Amasia and Tocat; and the coincidence of this district with that which contained the Hittite capital of Pteria; Amasia, the capital of Mithridates; and Comana, the religious centre of Pontus, may not be accidental. The Kizilbashes are very superstitious, and have several rites and ceremonies peculiar to themselves.

The settled Turks are chiefly found in the towns or as large land-owners in the villages; and they form the greater portion of the official class. There are also a few villages of Turks in the Angora and Brâsa vilayets. The upper class of Turks have no sympathy with the poorer Moslem peasantry, and look upon them as inferior beings from whom they may take all they can get. They still treat them in fact as a subject race, and the only connecting link is the common religion.

The Kûrds are found in the Haimaneh district south-west of Angora and in the Sivas vilayet. They speak Kûrdish, and are divided into Sunni (orthodox) and Kizilbash (Shi'a) Kûrds. There is also a Kûrdish tribe in the Sivas vilayet, possibly of Armenian origin, which retains certain Christian observances, and sometimes calls itself Christian.

Circassian communities are found in every part of the country; the principal settlements are those of the Gabardai, on the Uzun Yailas east of Sivas; of the Absekh and Shabsukh, in the low country near Amasia and Samsûn; of the Hagutch, around Sinope; of the Absekh at Balikisiri; and of the Abazi, Shabsukh, and Obukh at Adabazar and

Dûzje in the Isnik Sanjak; and in the Kastambûl vilayet. The Gabardai are a fine race, more manly, vigorous, and intelligent than the native peasantry, and quick at learning. The Circassians have introduced into the country improved carts, more comfortable houses, and a better system of agriculture; and if common care had been exercised in their settlement, they would have done much to develop the resources of the country. Circassian labourers are preferred to all others in many of the mines, and in the cotton-ginning factories in the Aidin vilayet.

In the Adana plain on the banks of the Jihûn there is a Noghai settlement, the history of which is one of the most painful I know. After the Crimean war about 20,000 Noghai families left Russia and settled on the plain; now barely 2000 families remain; the others have died off, partly from bad management of the Turkish authorities, partly from the effects of the trying climate.

In the Anti-Taurus there is a large tribe of Avscha'ars, once powerful, but now reduced in numbers and gradually changing from the nomad to the settled state. According to their own tradition, they came from the borders of Persian Khorassan; they are bold robbers and still somewhat intractable.

On the Cilician plain, where the original population has entirely disappeared, there are many settlements of Ansariyeh from Syria. They are good agriculturists, and as their numbers are increasing every year, and they stand the climate well, they may possibly colonise Cilicia as the Greeks are colonising the districts on the west coast.

The principal nomads are the Turkomans and Yûrûks, both of Turk origin; the former are found chiefly in the Angora vilayet; the latter almost everywhere, but particularly in the Konieh vilayet. The Yûrûks are large camel owners, and carry on most of the camel transport of the country; on this work the men are often away for seven or eight months at a time. They have large flocks of sheep and goats, and sometimes herds of cattle; they are very regular in their migrations, and each tribe or family has its well-known winter and summer pastures.

Amongst the semi-nomads, the Chepmi are the most interesting. They live in houses in winter, in tents in summer, and are wood-cutters, charcoal burners, and basket makers. They have no Imams, mosques, or religious books, and are despised by Moslems and nomads. When a man dies, they weep and wail over the corpse which is decked with flowers; and during the marriage ceremony the bride and bridegroom are given wine to drink. These customs have led some people to assign a Christian origin to the Chepmi; but some of their habits, such as their fondness for living near running water, lead me to think that they are more likely Ansariyeh, the descendants of men carried forward by some of the great tribal movements when Anatolia was overrun by Turkish hordes.

Gipsies, some Armenian and Christian, others clearly Indian; Jews; Cossacks; Bulgarians; Georgians; and Lazis; are found in several places; the two last are refugees from the district ceded to Russia after the Turco-Russian war. There are few countries in which such a number of different races and languages is to be found within the same area, or in which there is so much to interest the ethnologist.

Anatolia extends over such a wide area that it is impossible in a short paper to describe its geographical features in detail. I shall therefore confine my remarks to the south-eastern corner, which I have selected partly on account of its historic and geographical interest, and partly because we are favoured on the present occasion with the presence of Captain Bennet, R.E., the officer who surveyed the district, and who has not only unravelled the complicated river system of this wild mountain country, but thrown much light on many interesting historical questions.

In the vicinity of the celebrated pass of the Cilician Gates the Taurus is known as the Bûlghar Dagh, a high, hog-backed ridge, with a bare undulating summit, which attains an altitude of 9000 feet, and terminates on the north in abrupt cliffs. Eastward a series of rugged mountains, known by various names, connects the Bûlghar Dagh with the Ala Dagh, a long line of bare, rocky peaks, which forms the most picturesque and striking mountain range in Anatolia. Still further east the Taurus loses, for a while, something of its distinctive character, and only acquires it again when the Euphrates river system is reached.

The Anti-Taurus consists of a double range of mountains between which the Saris runs; the western range, which has no distinctive name, can be crossed by several easy passes; the eastern, known as the Binboa Dagh (mountain of a thousand peaks), is impassable except at one point, near Kemer, where a break occurs.

The Giaour Dagh is separated from the Taurus by the deep chasm through which the Jihûn flows, and runs S.S.W. to Râs el Khanzir. The mountains are bold and abrupt in character, and the Kaya Dûldûl at the northern end rises almost perpendicular from the bed of the Jihûn. Though only 15 or 25 miles wide, and rarely rising above 6000 feet, the range offers a formidable obstacle to traffic, and is only crossed by two practicable routes through the Bâghché and Beilan passes. East of the Giaour Dagh is a wide valley which stretches down to Antioch and is dotted with numerous mounds on which Hittite sculptures are exposed to view. Beyond the plain lies the Kûrt Dagh, a rugged limestone range, with no prominent peaks, through which there are no good roads.

This district is of some interest as being the commencement, as it were, of those natural features which attain such a remarkable development in Syria and Palestine. The Giaour Dagh running southward from the great east and west wall of the Taurus is connected by the Ansariyeh Mountains with Lebanon and the hills of Western Palestine; the Kûrt Dagh is similarly connected with Anti-Lebanon; and the valley

alluded to is the commencement of the hollow or depression which extends as the valleys of the Orontes, Leontes, and Jordan, to the Dead Sea, and is thence carried on by the 'Arabah and Gulf of 'Akabah to the Red Sea.

A minor hill feature, which has hitherto been wrongly shown on maps as Mount Amanus, lies between the Giaour Dagħ, from which it is separated by the narrow pass of Toprak Kaleh, and the Jihûn. From Toprak Kaleh the hills rise rather abruptly to 1200 feet or 1500 feet, but they soon break off into two branches, one running south-west as undulating hills, from 500 feet to 600 feet high, to fringe the western shore of the Gulf of Scanderûn; the other, taking a more westerly course, culminates in Jebel Nûr, 2000 feet, near Missis, and ends on the south in the Dedé Dagħ. The hills are passable in several directions, and the road connecting Adana with Scanderûn crosses them.

This mountain district is drained by three large rivers: the Cydnus (Tersûs Chai), the Sarus (Sihûn), and the Pyramus (Jihûn).

The Cydnus is formed by the junction of three streams, which rise in deep gorges at the foot of the Taurus, and unite, before they enter the plain, about two miles north of Tarsus. All three streams pass in places through narrow clefts, with lofty, inaccessible sides, which look, when seen from a distance, as if they had been cut in the limestone rock by some gigantic sword. The eastern stream runs down through the gorge of the Cilician Gates; the western through a gloomy chasm which is known as the Valley of Hell. About a mile north of Tarsus the Cydnus falls over a ridge of rock about 15 feet high, and it then pursues a sluggish course to the sea, which it enters near the marsh that marks the site of the old harbour of Tarsus. The river is liable to floods, and the silt which it has brought down has completely buried Roman Tarsus, which now lies from 25 to 30 feet below the surface of the ground.

The Sihûn is formed by the junction of the Samanti and Saris rivers. The first rises far to the north in the Uzûn Yaila, an elevated grass-covered plateau, on which the Gabardai Circassians raise an excellent breed of horses. Close to the source are the ruins of Viranshehr, a fortified station or town on the Roman road from Sivas to the El Bostan plain. Several brooks, full of excellent brown, speckled trout, run down through rich meadow land to join the parent stream, which, on leaving the Yailas, runs off in a south-westerly direction to Azizieh, the administrative centre of a large district inhabited only by Gabardai Circassians and Avscha'ars. Here, in a romantic hollow at the foot of a hill, crowned by a large tumulus, a full-grown stream wells up and rushes past the ruins of an old monastic establishment to swell the volume of the river. There are some indications to show that the monastery took the place of a temple, and that in this favoured spot there was a Roman or Græco-Roman settlement. Below Azizieh, in the latitude of Mount Argæus, the Samanti turns sharply to the south, and

then, after a westerly course of 18 miles, flows southward through the Taurus, in a deep gloomy chasm, which is walled in by such lofty precipices that it can only be approached on foot, and even then with difficulty. In the very heart of the Taurus, amidst the grandest scenery, the Samanti is joined by the Saris, which rises near the point where Anti-Taurus first takes definite shape as a twin mountain range. Between the two parallel ridges lies a rich open valley, through which the Saris, here a brawling mountain stream alive with trout, runs southwest to Kemer, where a remarkable break in the eastern range allowed the Roman road from Sivas and Kaisariéh to pass eastward to Gökşûn, the ancient Cocussus. The importance of the point is marked by the ruins of a Roman bridge, a large mound where the Roman station was situated, and a group of columns with illegible inscriptions. At Kemer the Saris takes a more southerly course, and, after running through a picturesque valley in which lie the ruins of the Cappadocian Comana, now Shahr, enters a wild gorge in the Taurus almost as difficult of access as that of the Samanti. After the united river, henceforward known as the Sihûn, leaves the mountains, it flows leisurely through the lower hills, amongst which it is joined by two large streams, the Eylinji-su and the Korkûn Irmak, and enters the great Cilician plain about two miles north of Adana. The Eylinji-su rises at the foot of the Ala Dagh, and runs through wild ravines to the Sihûn. The Korkûn Irmak rises west of the Ala Dagh, and its upper valley is followed by the direct road from Tarsus and Adana to Kaisariéh; it passes through deep, inaccessible gorges in its lower course, and previous to its junction with the Sihûn is joined by the Chakût-su. This last river is formed by the junction of two streams, followed by the roads from Eregli and Nigdeh, which unite at Takhta Keupru north of the Bûlghar Dagh. From this point the river passes through the Taurus to Bozanti, the old station of Podandus, amidst wild impressive scenery, and then enters a series of inaccessible defiles to emerge finally from a cleft with perpendicular walls of rock. At one point the sides of the chasm have fallen in and form a wooded valley—a gigantic natural bridge, beneath which the river flows unseen. Below Adana the Sihûn now bends to the southwest, and then, after a tortuous course, reaches the sea almost due south of Tarsus. The presence of an old channel, however, clearly indicates that, at one period, the river took a south-easterly direction, and joined the Jihûn opposite Dedé Dagh, whence the combined rivers flowed to the sea west of Karataş. This appears to have been the case in the time of Alexander, who, on his march eastward, is said to have crossed only one river. The Sihûn is navigable as far as Adana, but a bar at its mouth only admits of the passage of small craft.

The Jihûn is formed by the junction of the Sugutlû, which rises east of El Bostan; the Khurman-su, which rises to the north and runs along the eastern edge of the Binboa Dagh; the large springs south of

El Bostan; and the Gök-su, which rises towards the west, near Gökşân, the ancient Cocussus. The three first unite in the El Bostan plain, and they are joined by the last just before the river enters the deep rocky gorge which it has cut for itself through the Taurus. The Pyramus reaches the open country seven miles west of Marasch, and here it is joined by the Ak-su, which drains a large tract of country to the east; the river now bends to the west, and, passing through a remarkable defile between the Taurus and the Giaour Dagh, enters the Cilician plain a little east of Hemita Kaleh. The defile is only passable on foot, and Captain Bennet, R.E., the only European, I believe, who has visited it, describes the scenery to be of the grandest and wildest character. From Hemita Kaleh the Pyramus pursues a winding course to Missis (Mopsuestia), where it bends southwards, and finally enters the sea south of Ayas Bay, which it will eventually close. On the plain the Jihûn is joined by several important tributaries, such as the Savrûn and Kaish-su, which drain the country north and north-east of Kars; the Sombas-su, whose waters were once carried by an aqueduct to Anazarba; the Girgensu from the mountains north of Sis; the Hamis-su from the Baghché Pass (the Amanian Gates); the Kara-su from Osmanieh, &c. The Pyramus is navigable as far as Missis, but the bar prevents the entry of any but small craft; the water is turbid, from the quantity of matter held in suspension, and in summer it becomes heated and almost unfit for drinking.

The great Cilician plain which lies at the foot of the Taurus is divided into two sections by low swelling ground, which stretches southward to Missis. It has been formed by the silt brought down by the three great rivers, and consists of a rich stoneless loam from six to eight feet thick, with a subsoil of shingle. The western section is an unbroken expanse of cultivated ground, which produces excellent crops of corn and cotton; the eastern is almost uncultivated, and is partly covered by rank vegetation; from it isolated rocky crags (crowned with ruined castles) rise up like islands, the most important being Anazarba, Tumlo, and Ilan Kaleh. The coast-line is marked by sandhills about ten feet high, and lagoons and marshes fringed with reeds and cane-brakes. There are also two large marshes, one south-west of Tarsus, the other five miles south-west of Adana. The plain of Issus, which lies at the head of the Gulf of Scanderûn between the hills of Jebel Nûr and the Giaour Dagh, is more stony than the Cilician plain, and quite uncultivated.

The great highway between the east and the west passed through Tarsus, which may be conveniently used as a starting-point in describing the lines of communication. From Tarsus the road to the Anatolian plateau passes by an easy ascent to Sarishek Khan, on a branch of the Cydnus, where it is joined by a road from Adana constructed by Ibrahim Pacha. At Sarishek Khan the road enters a narrow gorge, and the really fine scenery of the historic pass commences; on either hand well-

wooded heights rise abruptly from the clear mountain stream, and far overhead bold masses of rock stand out picturesquely against the bright blue sky. After about five miles the road passes through the Cilician Gates, a narrow opening of 25 feet, where the stream rushes between perpendicular walls of rock, which break back in a succession of precipitous cliffs to the mountains on either side. Here there are several inscriptions, much defaced, but apparently recording the repair of the road. On passing through the Gates the ground becomes more open, and the great rock-wall of the Bülghar Dagħ bursts upon the view; a gradual ascent then leads up to the small plateau of Takir, which, at an altitude of 4200 feet, forms the water-parting between the feeders of the Cydnus and those of the Sarus. This strong position, which closes the great highway, was fortified by Ibrahim Pacha, whose lines still remain almost intact. From the plateau the road descends to Bozanti Khan (Podandus), whence one road crosses a spur to the upper valley of the Korkūn Irmak, and, following it to the water-parting, 5740 feet, continues onwards by Enegil to Kaisarieh; whilst another passes through a magnificent gorge between the Bülghar Dagħ and the mountains to the east to Takhta Keupru. At this place the road again divides, one branch running up a narrow rocky valley to Pachamakji (Faustinopolis) and Kiz, or Kilisseh Hissar (Tyana) to Nigdeh; the other by an easier route to Eregli (Heraclea). All these roads were probably used at a remote period; the first is the direct road from the plain to Pteria (Boghaz Keui) by Mazaca (Kaisarieh), and passes near the Bereketli Maden mines; the second, on which numerous rock-cuttings show the line of the ancient road, was the great thoroughfare, of which we have details in the Jerusalem and other itineraries, which connected Tarsus with Ancyra (Angora) and Constantinople; whilst the third, over which Ibrahim Pacha took his guns when he invaded Anatolia, passed near the mines of Bülghar Maden to Eregli, and thence continued onwards by Konieh to Ladik, where it joined the great highway from Ephesus. The whole district immediately north of the Bülghar Dagħ is of great interest; Hittite inscriptions have been found near the Bülghar Maden, and at Ivris, near Eregli; an incised Hittite inscription at Bor, on a slab said to have been brought from Tyana; and clay tablets with cuneiform inscriptions in ancient sites near Tyana. Much more might probably be found by any one who could devote a few weeks to the exploration of the country, which can be reached with ease from Mersina.

From Tarsus the road runs along the plain to Adana and Missis (Mopsuestia), the line of the old highway being marked at almost equal intervals by mounds which were probably occupied by guard-houses. After crossing the Pyramus at Missis the road enters the hills of Jebel Nūr, and passes by Kūrt Kūlak and the Demir Kapū (Cilician Gate) to the plain of Issus; it then continues round the Gulf of Scanderūn through Piyas (Baie) and by Jonah's pillar (Syrian Gate) to Alexan-

dretta (Scanderûn), whence it crosses the Beilan Pass (Pass of the Syrian Gates) to Antioch and Aleppo.

From the plain of Issus a road runs past the ruins of Epiphaneia, and through the narrow opening at Toprak Kaleh, where there are traces of a defensive wall (the Amanian Gate) to Osmanieh; it then crosses a plain for ten miles and passes by easy gradients over a spur to the open valley which leads up to Baghché. Here the road divides, one branch going over the Hatch Bel, 3700 feet, to Marasch; the other over the Baghché (Amanus) Pass, 3000 feet, to the plain between the Giaour Dagh and the Kûrt Dagh. The ascent on the latter road from Baghché to the water-parting is easy and gradual, but there is a rather sharp descent to the plain beyond.

We thus have three great roads leading to the plain of Issus, each of which passes through a natural and an artificial gate; and this may explain the apparent confusion in the accounts which have come down to us from classic times, and in the speculations of modern writers. The Cilician Pass has its gate at Demir Kapû; the Amanus Pass at Toprak Kaleh; and the Syrian Pass at Jonah's pillar.

A few words may be said in conclusion on the celebrated battle of Issus, the field of which is, I think, no longer a matter of uncertainty. Alexander, whilst at Mallus, near Karatash, heard that Darius was at Sochi, two marches beyond the Syrian Gates. Sochi is unknown, but was possibly one of the ruined sites between the Giaour Dagh and the Kûrt Dagh. Breaking up his camp, at Mallus, Alexander marched round the head of the Gulf of Scanderûn to Issus; there he left his sick under a small escort, and then pushed on to the Beilan (Syrian) Pass. He had just left the pass when he heard that Darius was in his rear, and had ill-treated and killed the men left behind at Issus; he immediately turned back, and the head of his army reached Jonah's pillar (Syrian Gates) at midnight; on the following day the battle was fought. Darius leaving Sochi, had travelled northwards and crossed the Giaour Dagh (Mount Amanus), by the Baghché Pass; he then passed through the narrow gap at Toprak Kaleh (Amanian Gates), and advanced upon Issus, which he occupied; his troops were afterwards pushed forward to the Pinarus. The identification of the Pinarus has given commentators much trouble; it is generally supposed to be the Deli Chai, but I think any one reading the description of the battle of Issus, with Captain Bennet's sketch of the plain in front of him, must come to the conclusion that the Pinarus is the stream which reaches the sea south of Piyas. The question turns on the form and dimensions of the plain, which at first, north of Jonah's pillar, is very narrow, but gradually widens out northwards until it attains its greatest width at the point where the Deli Chai crosses it. Now Arrian alludes to Alexander's delight when he found that Darius had moved from the broader into the narrower part of the plain, where, though there was

sufficient room for the Macedonians to deploy, the Persians could not utilise their large force. This applies to the Piyas stream, but not to the Deli Chai, and the same result is obtained if the distance occupied by the front of Alexander's army is compared with that between the mountains and the sea south of Piyas.

This is only one instance of many in which our Consular journeys have thrown light on obscure points in classical geography. I believe if our sketches were put together, as I hope they may be some day, we should be able to reconstruct the ancient road system of the country; to follow the marches of Cyrus, Alexander, Manlius, and Cæsar in ancient times, and, in more modern, the march of the Crusaders to Palestine; to understand the mountain campaigns of Cicero, the long struggle of the Byzantine emperors with the Seljûk and Ottoman Turks; and to lay down with fair accuracy the boundaries of the ancient provinces.

Previous to the reading of the above,

The CHAIRMAN (Sir HENRY RAWLINSON), said it was hardly necessary to introduce Sir Charles Wilson to the meeting, because for the last twenty years he had been before the geographical public. Not only had he been a member of the Council of the Society, but he had rendered very important services to geographical science abroad. His first employment at the commencement of his career was in British Columbia. In 1864 he conducted a survey of Jerusalem, and thus inaugurated those interesting surveys which had since been carried to maturity under the auspices of the Palestine Exploration Fund. His survey of Jerusalem, so far as his personal services were concerned, was entirely at his own expense. In 1865, on the same terms, he carried out a line of levels from the Mediterranean to the Dead Sea, and for the first time determined with exactitude the extraordinary depression of that inland sea. Shortly afterwards the Palestine Exploration Fund was instituted, and funds were collected for the purpose. Under their auspices he did a large amount of most important geographical work. After the Treaty of Berlin he was appointed by the Foreign Office as Her Majesty's Consul-General in Anatolia, where the British Government were first called upon to interfere in order to promote the reforms promised by the Porte under the Treaty of Berlin. For three years and a half he was employed in Asia Minor, and during that time travelled through all parts of the country. The geography had previously been very ill understood, and, in fact, ranges of mountains had been erroneously laid down, so that the maps had to be reconstructed in many points. The paper to be read gave an account of his travels, especially in the neighbourhood of the Gulf of Issus, where some most important discoveries were made. After leaving Anatolia Sir Charles was employed on special duty in Egypt, where, besides other important services, he superintended the trial of Arabi Pasha.

After the paper,

Captain BENNET said that the portion of Anatolia to which he was accredited was in the south-east. In the summer time his head-quarters were at Kaisarieh, which lay at the foot of the northern slopes of Mount Argæus. On the northern slopes near the summit it was always snow-clad, but on the southern slope it was clear from snow in July and August, when the ascent was practicable from the south and east; the actual summit, a rock of 30 feet, was not however attainable. The Plain of Adana consisted of two parts, the boundary of one commencing at

Mersina and extending to Missis, about 60 miles, while from Missis to Karatash it was about 30 miles, the area being about 800 square miles. The other plain further to the east was separated from the sea by a belt of hills having a maximum elevation of about 1800 feet. Its area was about 600 square miles. The western plain was far more cultivated than the eastern. He had travelled over the whole of these plains and had been able to sketch them with a certain amount of accuracy. The Adana climate had been very badly spoken of by some persons who had gone there in the hot season and exposed themselves, but it did not deserve such a bad name. He lived there continuously in the winter, and for a month in the hottest time, and experienced no difficulty. The temperature in summer rarely attained 100° Fahr. as a maximum, and there was always a sea-breeze by day. The winters were very variable; sometimes when they were very wet the rivers overflowed, and then it was scarcely possible to move about. There was only one macadamised road, and the southern portions of the plain at such times looked almost like a sea. The second winter he was there there was frost every night for six weeks, while the days were bright and sunny. The eastern plain, in consequence of its being so much less cultivated, was far more unhealthy than the western plain, the marshes were more extensive, in spring there was a dense growth of weeds of all sorts, and the heat was great, flies being numerous. If, however, it were again cultivated as it was formerly, it would no doubt become as healthy as the western plain. As a proof that the Adana plain was not unhealthy, he might mention that annually in July and August some 40,000 or 50,000 outsiders came there from the colder regions, and he had never heard that the mortality among them was anything considerable. He was induced to explore the gorge of the Jihûn from an idea that prevailed that it was practicable to navigate the river. The fall through the gorge for 15 or 20 miles was 500 or 600 feet. It was very rocky, and it was quite impossible to get a boat through. Neither could a road or a railway be made there, except at enormous expense. The last four or five miles that he traversed he had to go on foot as it was impossible to ride. The track continually ascended and descended; on the northern side the mountains rose almost precipitously for 3000 or 4000 feet, the southern side was very little better, the Kaya Dûldûl was an almost precipitous rock 5000 or 6000 feet high, rising almost sheer from the river. He explored other passes in all directions. The chief one was by the Cilician Gates. Another important one led up from Sis to the Anti-Taurus and Sivas. In the Giaour Dagħ between the Bagtche and Beilan passes there was no easy road, nearly all being 5000 feet high as compared with the Beilan Pass, 2000 feet, and the Amanian Pass, 3000 feet. The routes to the north of the Jihûn from Kars to Marash were exceedingly difficult, the country being very rough and mountainous. A road would not be wanted there if a good one were made from the plains to Marash and Aintab viâ Bagtche. The Beilan Pass was the easiest. A road had already been made in certain parts over it, and though it was not open to wheeled traffic, a very little labour would make it so.

In answer to a question by the CHAIRMAN, as to whether he thought the Beilan Pass the most practicable for a railway, Captain BENNET said he had not sufficient experience of railway engineering to give a decided opinion. Much depended on the nature of the country beyond the Giaour Dagħ and on the direction required. If a railway was wanted with Mersina or Ayas Bay as base to go in a north-east direction to Marash and Kharput or even to Aintab and Urfa, probably the Bagtche route would be preferred; but for a Euphrates Valley railway with Scanderûn as base, no doubt the Beilan route would be selected. His impression was in either case for a trunk line, the Giaour Dagħ would have to be tunnelled probably for three or four miles in the case of the Bagtche Pass, and for four or five miles in the case of

the Beilan Pass. Much light would, he thought, be thrown on the subject if the maps could be published, as it was he was speaking from memory.

Mr. DOUGLAS FRESHFIELD said he had only a literary acquaintance with the country described in the paper. But he had at one time planned a journey across it, and he knew well, therefore, how deficient our maps and information were. A great debt was due to Sir Charles Wilson and those who had worked under him, and the publication of the results of their survey would be looked forward to with impatience.

Among many other matters of interest awaiting fuller investigation at the hands of travellers in this region were the traces of Italian occupation along the southern coast of Asia Minor, the opposite Cyprus. The MSS. of Leonardo da Vinci afford curious evidence of the interest taken in this region in Italy in the 15th century. The memoranda and miscellaneous writings of the great painter have recently been published in a sumptuous form by Dr. Paul Richter, who has directed particular attention to a series of letters—or drafts of a romance in the form of letters—purporting to be addressed to the Governor of Syria (according to Colonel Yule the *dawādār*, literally “inkstand-keeper,” a minister of state) by Leonardo in the capacity of an engineer in the service of the Sultan of Babylon—that is Cairo. These letters contain accounts of Mount Caucasus and the Taurus, and of a recent catastrophe, apparently a landslip, in those regions. They are illustrated by a very rough but, for the time, accurate sketch-map of the sources of the Tigris and Euphrates, and several pen-and-ink drawings of rocks and streams.

Dr. Richter believes that Leonardo spent two years in Armenia (circa 1484-5), and that these are genuine records of travel, a belief Mr. Freshfield could not share for the following reasons:—

1. The names and descriptions given in Leonardo's map and letters are not such as would have been used by a medieval traveller, or understood by any oriental official. They are for the most part classical—many of them taken from Ptolemy; as for example, Pariades Mons, Anti-Taurus, Gordis Mons, Argeo Mons, Celeno Mons. The three words transcribed by Dr. Richter (as Leonardo wrote not only badly but backwards, transcriptions are far from a matter of certainty, and Dr. Richter has obviously gone wrong elsewhere in several cases) Goba, Arnigasar, Carunda, are not as the learned author suggests, names of mountain peaks, but probably Gora or Gori, Armachea or Armactica, and Karuna (Erzerûm). The description of the situation of Chalynra seems to be obscured by not translating *spiaggiie* in the sense of sea-coasts given it by Dr. Richter elsewhere. Celenderis, the medieval Kelindreh, is probably meant. The story about the Caucasus shining by night is found in Aristotle's *Meteorologica* (book 1, chap. xiii.), which, with Ptolemy's works, is frequently quoted by Leonardo.

2. Leonardo was in the habit of stimulating his imagination by putting together descriptions as well as by making tentative sketches of scenes and catastrophes he proposed to represent. Storms and landslips in particular had a fascination for him. There are several specimens of such fancy literary compositions in Dr. Richter's volumes, and this report resembles them in being based on a series of headings, “The divisions of the Book,” which look like the skeleton of a fiction rather than the basis of an official document. One of these fancy sketches (1354) resembles the Armenian letters in being addressed to an individual. The knowledge of the country shown is not such as a traveller would gain. It is literary knowledge. The Taurus and Caucasus are confused as they are in ancient authors, and the stories told of them are old-world fables. There is in these letters no sufficient proof that Leonardo had visited Armenia, for he displays frequently in his writings considerable knowledge of countries he had certainly never visited. Thus

he states as a fact, and the basis of an argument, that the Nile has its source in mountains on which the clouds fall in snow, and that 3000 miles in a direct line, or 4000 following the stream, from the Delta it receives the waters of three lakes situated "about 4000 braccie" above the sea-level.*

3. No drawing of any eastern building or person has been found among Leonardo's sketches with the exception of one of camels, made to illustrate a note on the means of crossing rivers, and three Armenian heads of the type common in Venice. It is inconceivable that the painter, if he ever lived in the East, should not have made hundreds of drawings of the new and strange things met with there. That no such drawings remain, and that there is no incidental reference, outside these letters, in his other writings to a residence in the Levant, seemed to Mr. Freshfield conclusive proofs that these Armenian reports are a mere flight of fancy. This view is taken by the Italian critics, Prof. Govi and Signor Morelli; while M. Ravaisson-Mollien and Signor Frizzoni on the whole follow Dr. Richter. There is no doubt something to be said for either view, and it is to be hoped that the question having been raised will be fairly threshed out by competent scholars. Dr. Richter does not lay claim to any particular knowledge of old-world geography, nor would his notes support such a claim; and his opinion ought not to be accepted by geographers without further inquiry.

The CHAIRMAN, in proposing a vote of thanks to Sir Charles Wilson, said he had himself crossed Asia Minor on three occasions, but always by the high road, so that he did not pretend to any personal knowledge of the districts which Sir Charles Wilson and Captain Bennet had described. The paper that had been read that evening was a very remarkable one, in consequence of its generalisations, a point in which the papers read before the Society were generally deficient. They often contained a good deal of personal anecdote and adventure, but very seldom ventured on such broad generalisations as Sir Charles Wilson had submitted to the meeting, though such results were of much greater importance as far as geographical science (for the advancement of which the Society was instituted) was concerned. His own interest in Asia Minor had hitherto been directed to archaeological rather than geographical subjects, and he should have been much gratified therefore if Sir Charles Wilson had gone a little more into the question of the Hittite antiquities. No doubt many members of the Society were aware that one of the great problems of the day was the history of the Hittites, who seemed to have formed a sort of connecting link between the Egyptians and Assyrians on one side and the Greeks on the other. Although their inscriptions had hitherto not been deciphered, still as materials accumulated it was to be hoped that something definite would be arrived at; and any light that Sir Charles Wilson could throw on the subject would have been most interesting and gratifying. He himself had never found in the Assyrian inscriptions any allusion to the Hittites in the interior of Asia Minor, so that he had been much surprised to hear that there were Hittite remains in Cappadocia, and even as far west as Bithynia and Galatia. Such a result seemed extraordinary, because the Assyrian notices of the Hittites were confined to the frontier land of Assyria and Anatolia, no mention of them occurring beyond the Taurus. In the earliest historical inscriptions of Assyria the dominant race of Asia Minor were the Akhi, whom he had hitherto ventured to consider the *Ἀχαιοί* or progenitors of the Greeks. These Akhi in about 1300 or 1400 B.C. were apparently in opposition to the Hittites. He did not know whether it had occurred to historical scholars that in the famous tenth chapter of Genesis, which gave the earliest ethnological sketch of the world, the

* Leonardo was wrong by the difference between braccie and feet, that is by more than 3000 feet.

descendants of Japheth really represented the exact state of the ethnology of Asia Minor in the eighth century B.C. The seven sons of Japheth indeed were the nations then occupying Asia Minor from west to east. The first was Gomer, representing the *Gimir* or Cimmerians, the history of whose invasion and subsequent migrations could be traced in the Assyrian inscriptions. Then came Magog, whom he regarded as the Magi. Later on the name came to be applied to the Scythians, but the original Magi were the principal division of the Medes, the name being written as Magog, owing to the well-known reduplication of the last syllable which was one of the peculiarities of the Assyrian writing. Then followed the Madai (the Medes), Javan or Greeks (Ionia), Meshech, and Tubal (Moschi and Tibareni), and Tiras, probably the *Turusha* or primitive Cimmerians. Those seven nations in the eighth century B.C. inhabited Asia Minor. Some were Aryans and others Turanians, the great difficulty being to decide which were one and which the other. There must have been in very early times a large Aryan immigration into Asia Minor, his own opinion being that this occurred at least 2000 or 3000 B.C. Probably before that time the inhabitants were exclusively Turanians. The second Aryan immigration, including the Cimmerians, the Medes, and probably the Sacæ and Cadusii, occurred apparently in the ninth and eighth centuries B.C., the present so-called indigenous tribes being the descendants of those Aryan immigrants. It was an exceedingly interesting, but one of the most complicated subjects in the whole range of ethnological science, because the tribes and nations of Asia Minor had been constantly moving, and it was impossible to trace all such migrations and movements down to the time of authentic history. Sir Charles Wilson had given a very good idea of the physical configuration of the country and the general appearance of the inhabitants, but he had not stated what success had attended the so-called introduction of reforms by the Turkish Government, to superintend which was one of the main objects of his own deputation to Anatolia. He was afraid not much progress had been hitherto made in that direction, but perhaps Sir Charles Wilson could hold out hopes of improvement in the future.

Sir CHARLES WILSON said that when he wrote his paper he was not aware that Sir Henry Rawlinson was to occupy the chair at the meeting, or he would have given a more important place to the Hittites; he was afraid that the subject would be too historical or antiquarian for the Society. He had carefully avoided touching upon the political state of Asia Minor, because he considered that it was not a subject which could well be brought before the Society. He would say, however, that he saw very little chance of the introduction of any real reform in the government of the country, and he did not think it was possible for the Turkish officials to reform themselves. They were just the same now as they ever were. At Konieh he met a thoroughly educated Turkish gentleman, and when standing on the mound which partly covered the great palace of the Seljûk emperors, the Turk, after looking at the scene, said, "What have we Ottoman Turks done since we came into the country but destroy?" No man could point to any caravanserai, road, or useful building which had been made by the Ottoman Turks, except the mosques at Constantinople, and Brûsa. He was sorry to say he saw no chance of any reforms being introduced into the country at present.

In answer to Sir HENRY LEFROY, Sir CHARLES WILSON said the lowest temperature he registered on the plateaux was 16° below zero Fahrenheit, at an elevation of about 4200 feet.

Route March, with camels, from Berber to Korosko in 1863.

By Lieut.-Colonel J. A. GRANT, C.B., F.R.S.

Map, p. 364.

THE following notes are taken from my Field-Book, kept during the journey across the Nubian Desert which I made with the late Captain Speke, on descending the Nile in 1863. As the mode of travelling is the same now as then, they are of interest at the present time, and the notes were made during the season of the year, that is in spring, when the Nile is at its lowest. A further inducement for offering them is that there does not appear to be any description of the route in the Society's publications.

Of all the journeys I have made in Africa—Abyssinia included—and in India, from the Khyber Pass to Calcutta and Bombay, this from Abu Hamed to Korosko is the very worst, from its barrenness, its heat, and from the fatigue and discomfort it necessitates. Abu Hamed, at one end, is a miserable hole with its fort and huts almost smothered in sand; and the scattered village of Korosko at the north end of the route is well described by the governor, who was there at the time, and called it as hot as —, for it is the focus of heat, being completely surrounded by steep-sided fiery mountains, which inclose the small confined space to the very huts, no exit except the Nile being visible.

Between these two miserable places there is a desert of 230 miles without one drop of water, except once at the Morad wells—not enough grass to fill your hat, not a hut nor a bundle of firewood in the entire route, nothing but eternal sand to walk over, varied by climbing over the most rugged ridges of rocks.

Our Zanzibar men and ourselves were each provided with a camel which carried our small kit, our water in leathern sacks, the same as the "mussocks" of India, two to each individual. The camels were the ordinary baggage animals, rough to a degree, going a solemn pace of from two to three miles per hour, according as the route necessitated. Our camel-men hurried them over yielding sand and led them slowly over the rocky divisions between the valleys, taking each camel by his guide-rope and telling him to be cautious over the stones.

At Abu Hamed we had to wait two or three days to fortify our camels for the desert journey, and to procure the requisite supplies for our party of thirty, for there was not enough in the bazaar. Our guides crossed the branch of the Nile here to an island (Mokrat) and procured a sheep and some vegetables, on which we lived for seven days, helped by biscuit, water, and tobacco.

In our journey across the desert, we travelled, at this dry season, day and night, chiefly by daylight, resting during the hottest portion

of each day, and the time occupied, from the fifth to the twelfth of May, was as follows :—

Day marching	.. .. .	53½ hours.
Night "	.. .. .	36½ "
Halts for sleep and rest	. . . .	76 "
		165½
Total time	.. .. .	165½

We were much overcome by sleep the first day or two; our men were so also, one actually tumbling off his camel while asleep; but we got used to this, though we were very sore from the motion and miserable saddles by the end of the journey, and were extremely delighted to arrive at Korosko and take boat to Assuan, though our beds on the bare desert were more comfortable than the hard planks of the boat.

The eight wells of Morad, at the middle of the journey, are in a valley surrounded by rugged hills, all jumbled together as if there was no outlet from them. The water, though natron-tasted and nauseous, is drunk by the natives regularly residing there, and is the only water procurable by travellers going across this desert towards Khartûm. Those in charge keep their sturdy little goats and sheep here, and exact a tax for the water supplied. The wells are protected by stone walls, partly for preventing camels and donkeys, and indeed human beings, from getting too near the water, and partly to prevent the drifting sand falling down the wells and filling them up, as a good dust-storm would do this effectually. The scene in the valley round the wells is of the most desolate description imaginable; the rocks are black, rugged, and destitute of the appearance of life; the valley is of sand. Still, somehow, there is a charm in the desert as well as a danger in the surrounding circumstances. Its utter stillness, its solitude, the chance of being drowned in a dust-storm, the chance of losing the way, the wildness of the narrow passes through the mountains, the almost total want of beast, bird, and insect life; no water, no wood, and the route unmistakably marked out by skeletons of camels displaying every form of death-agony; the tantalising, miraculous mirage of lakes and seas; the starlight marches—all excite an indefinable, but not wholly unpleasant feeling, which is not soon forgotten.

Many objects in the scenery of the desert are wonderfully interesting to those who have never previously seen the like; the forms and formations of the rocks gave me much to think on both then and since. What marvellous forms! how came they to be in such shapes? the beautiful colours of the sands of the desert formed from the different kinds of rock; purple and yellow, red and blue sands having been lashed up the slopes of the hills by the wind, and there resting like patches of snow on the hill-sides. Those marvellous solitary hills dotting the desert to the horizon—all nearly of uniform height, two to three hundred feet higher

than the sandy plain—some with cairns on them—how came they to be so formed? they are of sandstone—now in the shape of extinguishers, ninepins, batteries, ironclads on the ocean, table-topped mountains, busts of giants in stone. These I believe are formed solely by the dry penetrating sand, which, beating for centuries upon the platform of sandstone rock which once covered this region, and getting into the crevices, has by friction carved them out. Thus, sun and sand and wind combined have done the part of the engineer and excavated millions of tons of earth, leaving nothing but the bones as it were in the strange shapes which now remain, and the earth thus excavated is spread over the vast desert. Upon this plain there are strewn what looked in the distance like eighteen-pounder shot; some were stuck together, others were oblong: what were they? and how came they to be on the surface? They were heavy as iron, but not of iron; they were unctuous, and I could scarcely break one; they were a puzzle, but while sheltered under a solitary hill my curiosity was gratified by finding numerous specimens firmly imbedded in the solid coarsely grained sandstone rock of the country.

There was therefore much of novelty and of interest in this journey, but already too much space has been occupied by these preliminary remarks, and the march route will give fuller details.

I commence the notes from the river Atbara, one stage above Berber, to which we came by boat from Gondokoro, and from whence we took camels to Korosko.

April 23rd, 1863. Arrive at Berber by boat from Khartûm; should say there were four thousand inhabitants. Barracks fifty yards down the river. On the northern outskirts of town a high, mud-walled square place like a magazine, with embrasured towers at the north-west and south-east corner. Door is in south side—a high double one of wood.

24th to 26th. Halt, engaging 30 camels for the journey to Korosko. The Wukhil Rahan-Aga gives us the following stages to Abu Hamed.

1. El Chore	.. .. 2 hours.	6. Nuddi 6 hours.
2. El Abidy	.. .. 4 ..	7. Abu Hashim .. 6 ..
3. Gin-Enitah	.. .. 4 ..	8. Gegyh (?)
4. Wady Chumar	.. 5 ..	9. Meshra Jahesh .. 4 ..
5. Thûndûm	.. .. 7 ..	10. Abu Hamed .. 4 ..

27th, P.M. to sunset. Marched in the afternoon and arrived by sunset at El Chore, in 2½ hours. Route never more than quarter of a mile from the Nile. We were twenty-five souls, twenty-three followers, Speke and myself, each mounted on the ordinary baggage camel. Road firm, hard, and dead level. Distance six miles; north wind disagreeable.

28th, 7 to 10 A.M. Ride for three hours nine miles over firm level sand, occasionally with bush or with pebbles; arrive at El Abidy, where there is the course of a small stream. Nile bank high, no island in the river. Some acacias (*masilla*) give shade to those who wait at the ferry.

ROUTE MARCH, WITH CAMELS, FROM BERBER TO KOROSKO IN 1863. 329

- 4 to 7 P.M. March again for eight miles to Gin-Enitah; a straggling set of flat-roofed huts running east and west. Three parts of the route is a gravel path, and the last quarter is along a richer country with doom palms and euphorbias. An island in river has the same vegetation, but with coarse grass from which a poor kind of rope is made. To the north-west hills are in view.
- 29th, A cutting north wind. March nine miles to Wady Chumar, on the
7 to 10.30 A.M. river which runs in many courses amongst low rocks. The route is along high ground covered with shingle; dykes of strata are common; and vertical strata of quartz followed by a purple-blue, unctuous, clayey rock, splinters of which covered the surface. This undulating part of the journey resembles Madi at $4^{\circ} 30'$ north latitude. No habitations.
- 3.30 to 8.30 P.M. Fill our water-sacks and, leaving the Nile, cross the country for thirteen miles, so rocky and dreary, heavy sand in the hollows. Near the peaked height of Abu-ban, formed of loose, black rocks, some ariel were amongst the withered grass in herds of five and six. An interesting march geologically, as the strata are more recent as we proceed northwards.
- April 30th, Arrive at Bagé, $1\frac{1}{2}$ miles ahead of Nuddi on bank of Nile, which
7 to 10.30 A.M. runs amongst numberless rush-covered rocks and islets with considerable speed; stream shallow, not navigable now, and five hundred yards wide. Doom and date palms are luxuriant on both banks. Several old cairns by road-side. Our guides did not add to them.
- P.M. March for two hours over high ground with gravel and rock, then descend to Wady Shirag. Camp for the night in huts under date and doom palms on the brink of the high bank of river.
- May 1st, Eleven miles to Abu Hashim—namely, “the father of hospitality.”
6 to 10.30 A.M. A pleasant road to ride, drive, or walk over, being on the outskirts of wheat stubble. Palms, &c., line right bank of Nile, and to our right are glistening quartz, mica, cobalt-blue, and other rocks. Right quarter of river is full of rocks; water three hundred yards across with a current of $2\frac{1}{2}$ miles per hour.
- 3.30 to 11 P.M. March north-west across an elbow of desert, say 18 miles, to Gegyh. After the first hour dismount to drink at Nile. Camp is six or seven miles north-west of the large hill, Burgul-Anak. Crossing the desert was heavy walking, as it was generally strewn with pebbles and splinters of rock. River runs gently here, and has few rocks in its channel.
- 2nd, To Meshra Jahesh, upon a bend of the Nile, 11 miles, level easy
6.30 to 11 A.M. walking over a desert away from the river which is here a branch, 200 yards wide, blue and placid, with abrupt rocks jutting out of the water from both sides. No habitations on this side, but there are some on the other. Rest under doom palms during the heat of the day. To the south-east, five miles off, is “Jebel Hasri,” a high, bare, abrupt block which the route passes three miles off to the right.
- 4 P.M. Rode from 4 till 9 P.M., arrive at Abu Hamed on the right bank of the Nile, distance $12\frac{1}{2}$ miles, a wretched place of ankle-deep sand with a four-sided ruinous fort, having round towers at two opposite corners. The march across the desert is dreary and wild, but interesting from the quantity of delicately tinted pink and blue sedimentary rocks; others are marked red and white like butcher’s meat, or they are blue against white.

330 ROUTE MARCH, WITH CAMELS, FROM BERBER TO KOROSKO IN 1863.

- 7 P.M. By moonlight, at seven, were close to the river, and along its low, hard, firm gravel bank till the village was reached by 9 P.M.
- 9 P.M. Halt, testing water-bags, getting green fodder, and putting our camels
3rd and 4th. into training for the eight days of waterless desert between Abu Hamed and Korosko. The bazaar has but two miserable shops with dates, oats, dūrra, tobacco, &c., and our guides have to cross the river branch by ferry to Mokrat Island to procure us onions, fodder, sheep, milk, fowls, and eggs. The price asked for a Hygeen (riding) camel is from 20 to 25 dollars, that of a baggage camel 14, 15, and 16 dollars. The latter carry eleven cantars; the cantar varies in weight, but a load is from 4 to 500 lbs. Camels not allowed water for two days, but will have as much as they can drink just before they start.
- 5th. Cut up a whole sheep into fragments and boil it in grease for eating in the desert when there is no wood for fire. Take some firewood. Hire guides at one and two dollars each. Several of our camels' feet were shod with leather sewn to their hoofs as protection against the sharp-pointed rocks on the route.
- 12.30 P.M. March 12.30 P.M. from Abu Hamed with 29 camels carrying water, baggage, two guides, three men and ourselves—also our twenty-four Zanzibar followers. The supply of water for this party of thirty-one people was fifty-four goat-skins and four cow-skins filled with Nile water. The guides wished us to engage more camels for the water, but we had more than enough water as it proved; besides which, the camels carried their own corn. Going along a gravel-covered desert, we made for the right of a roach-backed hill called Mukran—the country is called by this name—reaching it by 6.30 P.M., when we rested two hours to corn the camels. The route was without even a shrub; one dove, a jet-black swift flew about the legs of our camels, sand-larks or finches, sand-grouse, lizards of two sorts, with shiny and rough skins, and the holes made in the ground by sand-rats, were the only signs of life in this desert. Of death, numerous skeletons of camels, in all the stages of decay, showing their manner of dying—a sinewy extended leg, a leg cramped up and the head everted—marked the track of caravans; nine-tenths of these animals had succumbed towards the end of the journey. Our followers enjoyed the journey, keeping up a continual “chaff,” making jokes on the mirage, such as, “Fetch me some water! Don't you see the lake with boats? Cook me some dinner!” Natives call the mirage *belama*, or “the false sea.” During this march I had drunk twice, but could very well have done without water, besides which, it had a vile taste from the oil which had been rubbed on the exterior of the water-sacks.
- 6.30 P.M. Were in our saddles by 8.30 P.M., sailing over the perfect plain, which was strewn with small pebbles; continued this for six hours, making 18 miles, as the camels went famously during the coolness of the night. Reach Abu-Inteh-Shurrut (short of Furrudh) by 2.30 A.M. and lie down for four hours. Felt as if drugged during the journey—walking over heavy sand had little effect in awaking me. Hills were in sight all along this route. Our course to the west of north.
- 6th, Up and off by sunrise after a refreshing beverage of coffee in the desert. Though the route is firm and level, the camels go stiffly to-day. Reach Furrudh (single) by 10.30, making 10 miles; rest till
6.30 to
10.30 A.M.

- 2.30 P.M. 2.30 P.M., and then made for "Dur-wæbt," or the door of the Pass.
- 6.30 P.M. At Taban, 10 miles, we halt from 6.30 till 11.30 P.M., feeding camels with corn and waiting till a dust-storm blew over. Not a twig nor a blade the whole distance, path firm and any breadth. Just as the proper time came to start, our guide warned all against the coming dust-storm, "Look out, it's going to blow." A dense cloud of dust was rolling towards us from the east: out went the candle, pelt went the gravel and sand on our heads and faces, and down all lay flat—muffled up till it was over—nothing after all. Packed and away, marching at 11.30 P.M. over a flat, dreary, long desert.
- 11.30 P.M. By 1 A.M. had the two cones of Gorebat to our left, and a mile on, 7th, another cone, the "Drummer," "Abnugara." Enter a winding valley, 1 A.M. three to one thousand yards wide, and 23½ miles in length, paved with sand and rock splinters from the rugged hills on either side. The route runs parallel with the hill ranges, which are in waving dykes or ridges of stratified rock, rather vertical and black, similar in contour to Jebel Kuku 3° N. lat., each receding dyke rising higher and higher till they attain say four hundred to one thousand feet above the valley.
- Sunrise. At sunrise the path for our camels in file became so narrow and steep that the camel-men cautioned their animals earnestly against danger, calling, "Abd el-Ka-a-der," to them. Met seven or eight men mounted upon camels and donkeys. During the march through this death-like prospect, saw a dozen acacia, and camp, 8.30 A.M., by one in a wide valley raised to a high level by drifted sand and surrounded by cloud-like scowling hills. Distance to Ipseha, 23 miles; time, 9½ hours.
- 8.30 A.M. Re-saddle after five hours' rest, and are off from 1.30 to 6.30 P.M., 1.30 P.M. 11 miles. Pass varies, at one place the width only allows two camels to pass abreast; again it is one thousand yards wide. The sand sweeps up the sides of the hills almost drowning them. Heat reflected from the rocks on either side made all perspire profusely.
- 4 P.M. Four P.M., we had got out of the pass and were marching upon a high level of drifted sand on which we rest. The look back upon Jebel Jafaz'dba—lit up by purple and yellow tints on the sand—is wild and even grand. Now, for the first time, we had entered upon a desert formed of moving sand—boundless as far as the eye could reach—no path nor track, and all the camel-men uttered their howl of "Abd el-Ka-a-der" to urge the camels to a smart pace, as there is danger in such a desert from storms, and the shades of night were falling fast. But there was no chance of a dust-storm as the sky remained clear. The footing was firm; and as the sun was setting we lay down for two hours' rest to refresh man and beast with a snooze and food. Distance marched 11 miles. At 9.30 P.M. the march recommences, continuing till 3.30 next morning.
- 7.30 P.M. During last night the first part of the march was over sand, the 8th, country then changed, we walked over the peaks of the hills, then 3.30 A.M. again we returned to a path, surprised at the knowledge our guides have of the route during the darkness of night, but the hills in a measure guide them. Last half of this march, up to the outskirts of the Morad valleys, is generally level, but with rocky ground making the footing difficult. Camels move abreast of each other in such places, as in this formation they move quicker than when in file.

332 ROUTE MARCH, WITH CAMELS, FROM BERBER TO KOROSKO IN 1863.

9 A.M. Halt from 3.30 A.M. after a march of 17 miles, till 6 A.M., march from 6 till 9 A.M. when Morad was reached, after a march of eight miles. Route at first was intricate walking for the tender feet of the camels, as they had to walk over the tops of rocks which showed on the surface and at the ridges to be crossed, but the ascents and descents were gentle and easy. At 8.30 A.M. observe a path joining from the right.

The Valley of Morad runs from east to west. Five to eight wells are dug here; the wells we rest by have six inches of water ten feet below level of ground, they did not run dry from the supply we all took; the water tastes of saltpetre; a double wall protects the wells from the animals which crowd round. There are some eight Arab tents made of matting seen from the wells—none but an Arab could live in them—with their herds of healthy looking, long-haired little goats—thirty to sixty of them. These are brought to drink every third or fourth day. No firewood here, though we expected it. Since leaving Abu Hamed, we have seen only about twenty-four acacias, and one doom palm in the distance of 114 miles. A caravan left at 10 A.M. for Korosko. I see that the leather water-bags are white outside from the water. Camels are freely purged by it for one day, soap curdles in it. People are like other inhabitants, but one man asked for chest medicine.

9th, 11 A.M. Were saddled and away from the well by 11 A.M.; passed through a succession of valleys by crossing rocky ridges of stratification. The valleys are tempting for a canter on horseback, and their sands of many colours sweep up the sides of the hills like drifted snow. The clay slate rocks are now uplifted from the north. View of the Valley of Dulleh is very wild when seen through the cliffs overhanging the passes. A curious line of palms with strange fruit improves the landscape, they are single stemmed with leaves similar to the doom. Acacias also grow in the dry bed of the valley. The ridges of slaty rock now uplifted from the north plain stand erect like park palings, waving irregularly in the sky line. One very remarkable dyke in sight of Wady Sufur is crossed, it is 400 yards long and so regular that it seems as if built by man as a march boundary.

2 P.M. Reach Wady Sufur where there are wells during the rains. It is an open valley with no outlet visible. Then get to Thillatha Jinda with a few trees in its valley. At Wady Marisha we rest at 6.30, and refresh after 18 miles' marching.

6.30 P.M. Were in the saddle by 8.30 P.M. and marched till 2.45 A.M. at a smart pace, getting over nineteen miles across heavy sand which floods the whole country, giving the hills a choked-up appearance. Some blue blocks of stone were like lumps of cobalt; tinted spar was also picked up. Halt to rest from 2.45 till 6 A.M.

8.30 P.M. From 6 till 8.45 A.M. nine miles across the desert of Bahr Hud-ab, with a long flat hill to our right, to a shelter stone called Abu Rakib ("father of shade") which stands on rising ground commanding a view of the sandy sea which we had just passed. Came on heavy stone round-shot here for the first time; they seem to be hard balls of clay rounded into varied forms by the cutting sand, from one to three and a half inches in diameter, sometimes stuck together, and are from the

coarse-grained sandstone hills where they may be observed imbedded in the rock.

The great sea of sand, Bahr Hud-ab, was strewn with these round-shot and dotted with black hills of equal height, in the form of cones, haycocks, mushrooms, batteries, &c. (See illustration in map.)

8.45 A.M. During the fiery heat of the day we got shelter from the "Father of Shade" rock. The postman of the district between Korosko and Murat, two and a half days' journey, passed us on his camel last night. He receives two dollars per month and supplies his own camels; six postmen are on the route. Mirages at eight this morning.

3 P.M. Off from 3 till 7 P.M., 10 miles of desert across Bahr Belāma with flat-topped and elongated cones dotting it; make one long descent and rest within two miles of the pass in the range of low hills in front of us and which we were to cross; the outline of the hills was very

7 P.M. broken. At the lowest point in the descent a well had been dug, but was empty. Our sheikh made us urge our camels along fast and complained of one of our men who declined to ride; the man was a silly fellow, the sheikh saying any who remained in this desert went mad. Camels received grain morning and evening of yesterday, and again here to-day.

9 P.M. Off from 9 P.M. till 3.30 A.M., 16 miles. A black swallow hangs in the air round the heads and legs of the camels, sometimes resting on the ground as if wearied. After two miles of open desert, by starlight,

9.30 P.M. we enter the hills at "El Bab," literally the door, and keep along the valley between hills: road of sand, but not very heavy. After we had passed within the hills our guides halted us and commenced rattling upon the bones of dead camels, skirling and yowling like jackals. This over, their leader begged that a present be given to the M'Zeema, as all new travellers pay their footing; they would get a present, so on we went. Walking ahead of caravan, previous to above event, the sheikh fired a gun as he feared we had lost our way, and strongly advised us to keep together.

10.30 P.M. Once within the hills, they are bare and abrupt; at the fourth mile they have been worn down into the shape of bosses, batteries, &c., and continue so farther north; the footing is of levelled sand.

11th,
3.30 A.M. From 3.30 till 6 A.M. sleep soundly, and then march. From 6 till 9.30 A.M. walk all the way, about nine miles, as it was downwards all the distance and good firm sand. Withered bushes blown into spheres were on the plain and green plants of senna showed that we approached vegetation. Here at Ugab Ghowab is a shelter-rock of sandstone with a dry well, protected by a stone wall; hills precipitous as usual, often with cairns on their summits as if they had once been accessible. The well had been built by an Effendi, and was intended to collect rain-water and protect it with the shelter-rock, but the well was a failure.

2.30 P.M. Having rested as well as the wind from every direction would allow us, we crossed a rocky ridge of hills between two valleys. This was a difficulty, and our guides had to urge our camels over it by cries of Abd el-Kader. From 2.30 till 7 P.M. made 11 miles; after the first mile we leave the bed of the valley to our left, and then pass over drifted sand with sandstone blocks rising from it. These were horizontal in strata, conical in form, black and weather-beaten. To-day,

7 P.M. on two occasions, we walked over irregular shaped slabs of sandstone which form a paved way. "Round-shot" were still about. Halt from 7 till 8.30 when we march till 3 A.M. of the 12th, making 16½ miles, a winding course amongst frustums of cones over sand—sand, eternal sand. Between one and two in the morning cross rocky ridges from one valley to another, the camels being led over in single file with shouts of Abd el-Kader for every one; our direction for six days has been more or less on the pointers to the polar star, when horizontal, namely, to the west of north.

12th,
1 A.M.

6 A.M. From 6 till 10 A.M. to Korosko on the Nile, 10 miles. During this march there are the same cone-shaped remnants of hills, the same "bombs" and sand as previously met with—not a tree, nor a blade of grass, no water, no firewood. Walked over genuine old red sandstone in the latter part of the journey, but there were river pebbles the size of a mango cemented in it, and forming a conglomerate almost flinty in hardness. The first indication of civilisation was some date palms and a general appearance that the Nile must be running between the range of hills in front of us, and to test this, the sheikh was asked for a drink of water. His reply was, "Do not have any now; the water of the river is so close." Each of the men had plenty of water left of what had been filled at Morad wells. Two of our followers used only one goat-skin of water in four days.

10 A.M.

Rounding a hill-spur, the scattered village of Korosko is full before the traveller, surrounded by hills whose sides are chiefly of fiery coloured sand—a focus of heat, certainly; the palms can scarcely bear it, they grow long stemmed and resemble the wild date of Uganda in height. Korosko has a few walled-in houses, some trees under which the people live protected by mats, and a wretched bazaar. The single diabeeah is engaged by Speke—our kit put on board with thanks for being delivered from camel-riding. Too stiff and sore to call on the Effendi governor who is under Assuan and not Berber. Receive some cuts of water-melon and sweet biscuit from him—such a treat. Bathe in abundance of water. Effendi calls on us with two of his sons—has a cigar and calls Korosko a hell and Assuan a cool place, because the hills cease there.

7 P.M.

Speke and all our party leave Korosko for Shillal at 7 P.M. on board a diabeeah for which twenty-five dollars and twenty piastres were paid; only six working oars, no plank covers the hold, but we are lucky to get away so quickly.

Our camel-men from Berber to Korosko, two sheikhs and eight servants—uncle, nephew, four men and four boys—we shall never again meet the like of for civility, knowledge of their work, modesty, and unassuming manners. During the march they would hand water, pack the camels, pick up fallen things, and do everything for our native Zanzibaris as readily as for us—never a grumble nor a beg. On wishing us good-bye, the sheikhs received three dollars each, and each of the eight men a dollar, and went their way rejoicing.

[EXTRACT FROM THE ABOVE FIELD-BOOK, SHOWING THE TIME TAKEN BY BAGGAGE-CAMELS IN APRIL AND MAY, 1863, BETWEEN BERBER AND KOROSKO.

Dates.	On the March.	Time Taken. Hours.	Distances in Miles.	Stages or Camps.
1863. 27th April to 2nd May	.. ..	40½	115	From Berber to Abu Hamed by route mentioned on 24th, in eleven stages.
3rd and 4th	{ Halt at Abu Hamed.			
5th	{ 12.30 to 5.30 P.M.	7	15	Desert.
5th and 6th	{ 8.30 P.M. to 2.30 A.M.	6	18	Abu-Inteh-Shurrut.
6th	{ 6.30 to 10.30 A.M.	4	12	Furrudh.
6th	{ 2.30 to ½ after sunset	3½	10	Tabun.
6th and 7th	{ 11.30 P.M. to 8.30 A.M.	9	23	Ipscha.
7th	{ 1.30 to 6.30 P.M.	5	11	Desert.
7th to 8th	{ 9.30 P.M. to 3.30 A.M.	6	17	Desert.
8th	{ 6 to 9 A.M.	3	8	Wells of Morad.
9th	{ 11 A.M. to 6.30 P.M.	7½	18	Wady Marisha.
9th and 10th	{ 8.30 P.M. to 2.45 A.M.	6½	18	Desert.
10th	{ 6 to 9.15 A.M.	8½	9	Abu Rakib.
10th	{ 3 to 7 P.M.	4	10	Desert.
10th and 11th	{ 9 P.M. to 3.30 A.M.	6½	16	Desert, "El Bab."
11th	{ 6 to 9.30 A.M.	3½	9	Ugab Ghowab.
11th	{ 2.50 to 7 P.M.	4½	11	} Desert.
11th and 12th	{ 8.30 P.M. to 3 A.M.	6½	15½	
12th	{ 6 to 10 A.M.	4	10	Korosko on Nile.
	Total ..	89½	230½	Abu Hamed to Korosko.

The Alpine Notes of Leonardo da Vinci.

By DOUGLAS W. FRESHFIELD, A.C., Secretary R.G.S.

LEONARDO DA VINCI's miscellaneous writings have lately been collected, translated into English, and annotated by the well-known German art-critic Dr. Paul Richter, and published in a sumptuous form with many facsimile illustrations from the great artist's sketches by Messrs. Sampson Low and Co.

This is not the place for any general criticism or appreciation of a labour of love, which, as a whole, has been carried out with great industry and intelligence. I cannot even attempt to summarise the many curious speculations in physical geography and geology which show Leonardo's extraordinary instinct as a scientific observer, or his minute and curious notes on mountain landscape, on the play of light and shadow among the folds of the hills, on the picturesque effects of storms and landslips. The combination of man of science and artist revealed in these pages is unique, and they will repay the most careful study.

My present object is a far humbler one; to take up the Alpine and a few of the Italian topographical memoranda of Leonardo da Vinci, and
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to show where in my opinion Dr. Richter has failed, or gone wrong, in his attempt to elucidate them.

Leonardo writing on aerial perspective, asserts that the blueness of the atmosphere arises from the sun's rays striking on the small particles of moisture floating in the lower regions and rendering them luminous against the immense darkness of space (for "black and white make blue," Note 304), and the less the extent of atmosphere between the eye and the outer void, the deeper the blueness (300*).

"And this," he says, "may be seen as I saw it, by any one going up Monboso, a peak (*giogo*) of the Alps which divide France from Italy. The base of this mountain (*qual montagna*) gives birth to the four rivers which flow in four different directions through the whole of Europe. And no mountain has its base at so great a height as this which lifts itself almost above the clouds, and snow seldom falls there, but only hail in the summer, when the clouds are highest. And this hail lies unmelted there, so that if it were not for the absorption (*retà*) of the rising and falling clouds, which does not happen twice in an age (*età*), an enormous mass of ice would be piled up there by the hail (*di li gradi di grandine*), and in the middle of July I found it very considerable (*grossissimo*), and the sun as it fell on the mountain (*montagnia*) was far brighter here than in the plains below, because a smaller extent of atmosphere lay between the summit of the mountain (*monte*) and the sun." [Dr. Richter's translation.]

This passage is repeated in 1060, where Dr. Richter in a footnote judiciously proposes to read *estate* for *età*. But this emendation will not by itself give meaning to the sentence: *retà* can hardly mean absorption, and if it did, what sense do we get? But if we also read *rarity* for *retà*, the passage becomes intelligible: "the rarity of clouds falling, or mounting, to it, which they do not do twice in a summer." This follows naturally on what has gone before on the mountain rising "almost above the clouds." Leonardo is only repeating the idea as old as Homer ('Odyssey,' Bk. vi. line 24) of eternal sunshine resting on the mountain's head. He may have got it directly from Pomponius Mela (ii. 2, § 120), who speaks of the top of Athos as reaching the supreme æther; or from Sir John Maundevile, whose book was, we know from another memorandum, in Leonardo's library.†

In a further footnote Dr. Richter states that he has "vainly inquired of every available authority for a solution of the mystery of what mountain is intended by Mon Boso. It seems most obvious to refer it

* The figures refer to the numbering of the notes in Dr. Richter's volumes.

† Here is Maundevile's story about Mount Athos: "And above at the top of the hill is the air so clear that men may find no wind there. And, therefore, may no beast live there, so is the air dry. And men say in these countries that philocephers sometime went upon these hills, and held to their nose a sponge, moisted with water for to have air, for the air above was so dry. . . . And therefore it seemeth well that these hills pass the clouds and join to the pure air."

“to Monte Rosa. *Rosa* is derived from the Keltic *ros* which survives in Breton and in Gaelic, meaning in its first sense, a mountain spur, but “which also, like *horn*, means a very high peak; thus Monte Rosa would “mean literally the High Peak.”

To most of the statements in this note I must, I fear, take exception. The Royal Geographical Society and the Alpine Club may be outside the scope of art-critics, but on matters of mountain nomenclature they may I think be somewhat of authorities—at any rate contain some authorities! But let this pass. The “mystery” seems to me by no means hopelessly profound, when a little thought has been given to it.

Leonardo gives us an indication of where to look in telling us that the spot in question is a “*giogo*” (*jugum*, rather ridge or pass than “peak”) of the Alps that divide France and Italy. This disposes at once of Monte Rosa, which lay on the confines of the Bishopric of Sion.

What pass or peak is there in the Western Alps with a similar name? I recall the “*Monveso*” of local signboards, with the *Passo di Monveso* (or *Col de la Traversette*) on its northern flank. Dr. Richter’s key to Leonardo’s handwriting shows *b* and *v* to be very much alike in it. Note 1057 tells us that Leonardo was acquainted with the district, for he mentions the quarries of *Monbracco* near *Paesana*, at the foot of *Monte Viso*. The pass in question was renowned in Leonardo’s days from the boring of the first Alpine tunnel, a work likely to attract the great engineer’s curiosity; * and pass and peak were constantly confused by later writers than Leonardo. Thus for instance the *Marquis de St. Simon* takes the Carthaginians over the pass and Hannibal up the peak of *Monte Viso*, whence he makes him see Rome and shout down encouragement to his soldiers, some three “crow’s miles” off!

But how do we account for the four rivers: since only one, the *Po*, rises in *Monte Viso*? *Montagnia* properly means “a chain,” and in this passage refers to “*Alpi*,” and not to the particular peak or *monte*. Leonardo is only repeating a stock commonplace of medieval writers (see also Note 1063).

I do not of course suppose that Leonardo went up *Monte Viso*; he went *up to it*. This nice distinction was quite beyond the medieval mind. Indeed the modern does not always master it. I was myself soundly rated once by some German newspapers and the *Pall Mall Gazette* for claiming the first ascent of *Kazbek* to the neglect of a traveller who had previously ascended the mountain—up to the lower limit of eternal snow.

I tremble to enter on the treacherous ground of etymology; and I have no doubt that a dozen professors in their studies have settled that *Monte Rosa* comes “from the Keltic *ros*.” But if I am to give up my simple belief that *Monte Rosa* has been—since *Simler* in A.D. 1567 spoke of it as “*Mons Rosse*”—the *Rose of Dawn* or *Twilight* to the shepherds of a thousand hills; if poetry is to yield to science, I shall prefer a science

* See ‘*Alpine Journal*,’ x. p. 411.

that consults maps, that walks in the daylight and on the spot, to one that broods in distant studies by the light of its own inner consciousness—and I have got, I think, a reasonable derivation. I have caught another snowpeak on the other side of Val d'Aosta in the act of transforming its name from the grub of commonplace to the butterfly of poetry. In Mr. King's 'Italian Valleys' (1858), we read of "a glacier which our guide called 'Ruise de Bonch'—*ruise* being the patois for glacier." *Buise* has this meaning on both sides of Val d'Aosta. Now the peak in question (at the head of Val Champorcher) when it gets into the hands of the Italian Staff comes out as Monte Rosa dei Banchi. It bears this title both in the official report 'Le Alpi che cingono l'Italia' of 1845, and in the recent Government maps. In other maps it appears as Roisebanque. In Canton Valais there is a Rosablance. The two mountains are alike in presenting broad, and comparatively pure, snow-fields.

In dealing with local names, students generally pay far too little attention to the variations introduced either by the rise and fall of tides of language, as in some recesses of the Valais, where German has overlapped Italian, or by the mistakes of military map-makers, who translate words of another tongue, as in Austro-Italian Tyrol, or of a patois, as in Val d'Aosta, into some shape which seems to them more reasonable.

In a recent volume of the 'Alpine Journal' (x. 280) I ventured, solely upon the internal evidence of his work, to surmise that Leonardo had studied round the lakelets of the Brianza and on the shores of Lago di Lecco. The notes published by Dr. Richter fully bear out this guess. The "Montagne di Mandello" (that is the Grigna behind Varenna on Lago di Lecco, elsewhere mentioned by name by Leonardo) are said to be "the biggest bare rocks" he knows. Val Sassina is rich in the "cose fantastiche" he delights in. The crest figured in the Windsor drawing (see vol. ii. p. 238) may be a recollection of the Resegone, or Saw Mountain of Lecco. Note the hillocks in the foreground in which Leonardo seizes the typical structure of ancient moraines such as abound round the mouths of the great Italian valleys.

The sketch made from some Madonna della Neve on August 2, 1473, reproduced by M. Ravaisson-Mollien in the *Gazette des Beaux Arts* and there assigned to the Maria zum Schnee of the Rigiberg, is clearly an Italian landscape and, I think, almost certainly a Tuscan landscape. The grounds on which it was assigned by the French critic to the Rigi will not bear even a moment's examination.

The "Val di Chiavenna" and Val Tellina, however, Leonardo knew about. In the former, he says, there are "deer, bouquetin, chamois, and terrible bears," but you must climb on hands and feet to catch them. "From mile to mile there are good inns," and up at the head of the valley—that is, on the ascent of the Splügen—"waterfalls of 700 feet in height, which it is a pleasure to see, and good living at four soldi the reckoning." Val Tellina makes much strong wine, and here too, living

is cheap. "At Bormio are the Baths." To these baths, fifty years later, Conrad Gesner, the Zurich naturalist, went to recover his health.

I cannot find any village of "San Gervagio" (1059) a quarter of a mile from Geneva, on the Arve. But there is an old church of St. Gervais near the railway station, which in the fifteenth century was outside the town.

The great landslip in Savoy, mentioned by Leonardo (1058), may be the fall of the Apremont, in the Isère valley, A.D. 1298.* But the description seems to refer to some more recent calamity. Another landslip mentioned (1092) Dr. Richter has rightly identified with the catastrophe in Val Blegno, on the way from Bellinzona to the Lukmanier Pass, which took place in A.D. 1512, when a great lake was formed and only the church steeples rose above its surface.

I may add a few corrections in detail:—

Note 1031. "Bellinzona" should clearly be Bellano, or Bellagio.

1030. "Rovine" should be translated landslips, not "ruins." †

933. If Leonardo wrote "Eurio lacho" (Lake of Uri), why translate it Lake of Lucerne? As to the lakes in the Apennines, "placed among the tops of high mountains," mentioned in the same note, there is some difficulty. "Pietra Pana," which Dr. Richter vaguely describes as a mountain near Florence, is of course Dante's famous "Pietra Pana," the modern Pania ‡ della Croce, near Lucca, the southern and most conspicuous peak of the Alpi Apuane, § and a glorious view-point. "Lago delle Sibylle a Norcia" must be looked for in the Monti della Sibylla, near Norcia, on the frontiers of the Abruzzi. Dr. Richter's guess of the Lago di Vico is too far-fetched, and that lake is not "placed on the top of a high mountain." But neither on the Pania nor the Monti Sibyllini is there now any basin of water worthy the name of lake. The largest can be no more than a pond.

Dr. Richter leaves us with another "lake question" on our hands. He says nothing to elucidate the Lake of "Fiesole" mentioned (987) in company with Trasimeno. The name may be faultily transcribed, and the lake referred to the now drained sheet of water which lay west of Arezzo, and is figured conspicuously in one of Leonardo's maps, and spoken of in his following note (988) as "adjacent to the Lake of Perugia."

* See 'Annuaire du Club Alpin Français,' 1883.

† Compare Dante's 'Inferno,' bk. xii. 4.

‡ Pania is a generic term here for high peaks, connected doubtless with Pena, Pen and Ben.

§ Many English readers, and even some of our critics of Italian literature, fail to notice that in Tuscany, both in common and literary usage, *Alpe* is a frequent term for the tops of the Apennines. In Italy, Switzerland, and Dauphiné, the term is applied to the part of the range which supplies common pasturage, in one case to the summits, in the others to the shoulders of the mountains. It is only given to snowy peaks by poets, tourists, and such-like inaccurate people.

In Note 933, and again in 1095, we find a strange liberty taken with Leonardo's geography. In both passages Leonardo makes a correct statement about the river Triton, that it flows through three lakes in Africa—Munace, Pallas, and Triton. "Trigon il quale passa per la Minore Africa" reads the original. "Tigri passa par l'Asia Minore" the editor twice amends with superfluous zeal, making out of sound sense nonsense. It is odd he should have done so just at the time the indefatigable M. de Lesseps has called attention by his inland-sea scheme to these African waters.

Of the series of illustrated letters—or drafts of a romance in the form of letters—to which Dr. Richter directs particular attention, and on which he founds an important theory, which has excited no little interest, I have spoken briefly in the remarks made before the Society at the conclusion of Sir Charles Wilson's paper, which will be found on a preceding page (p. 323).

GEOGRAPHICAL NOTES.

Our Anniversary Meeting.—The Fifty-third Anniversary of the Society was celebrated on Monday last, the 26th of May, the afternoon meeting and the dinner in the evening both passing off with the usual *éclat*. A full report will be given in our next issue; for the present it may suffice to note that the Royal Medals, Annual Grants, Prizes, &c., were awarded as follows:—The Founder's Medal to Mr. A. R. Colquhoun, for his journey from Canton to the Irawadi at Bhamo, in 1832, during which he executed surveys of the whole route, from Wu-chau (150 miles west of Canton) to Talifu, 1300 miles of which had never before been surveyed.—The Patron's Medal to Dr. Julius von Haast, in consideration of his systematic explorations of the Southern Island of New Zealand, in the course of which he ascertained the altitudes of 130 stations, and collected material for a map on the scale of four miles to an inch, the MS. of which he presented to the Royal Geographical Society. Also for his numerous contributions to our knowledge of New Zealand, made in the Society's publications and elsewhere.—In the absence of the Medallists, Sir Arthur Phayre attended to receive the medal for Mr. Colquhoun, and Sir Francis Dillon Bell, Agent-General for New Zealand, performed the like office for Dr. Julius von Haast.—The Murchison Grant for 1884 was awarded to Mr. W. W. McNair, for his adventurous journey into Kafiristan; the Back Bequest to Emil Boss, the Swiss guide, who for pure love of exploration and Alpine adventure, accompanied the Rev. W. S. Green to the New Zealand Alps and Mr. Graham to the Himalaya; the Cuthbert Peck Grant to Mr. McEwan, now on his way to Lake Nyassa to take up the work of

the late James Stewart, C.E., on the "Lake-Junction" Road. The three Honorary Corresponding Members which the Council annually elect, were announced to be for this year, M. Ferdinand de Lesseps, Dr. Max Buchner, and Dr. Julius von Haast. The Geographical Medals offered by the Society to the chief Public Schools were presented to the following successful competitors:—*Physical Geography*.—Gold Medal, Samuel William Carruthers, Dulwich College. (The Silver Medal not awarded.) *Political Geography*.—Gold Medal, Sylvester Arthur Fox, Dulwich College. Silver Medal, Edward Basil Nicholson, City of London School.—Sir Richard Temple, Bart., the examiner for the year in Political Geography, presented the young Medallists to the President, and made some remarks on the subject of Geographical Education in England.—The President, in his Address, in alluding to this branch of the Society's work, stated that although the Council had abandoned the scheme of Public Schools' Prizes, they had by no means renounced the hope of inducing our universities and public schools to adopt some well-considered plan for giving geography its due place in the education of our youth, and had decided, before taking further action, to appoint a Geographical Inspector for one year, whose duty will be to gather information at home and abroad on the methods of geographical teaching and to report fully on the subject.

Journey of M. Giraud in Central Africa.—M. Giraud, who is attempting to cross the African continent by a new route, viz. from the coast south of Zanzibar, past the southern end of Tanganyika to Lake Bangweolo and thence down the Lualaba-Congo to Stanley Pool, has met with serious obstacles in descending the Luapula to Lake Moero, and has been compelled to retreat for a time to the Belgian station at Karema. He writes from the latter place on the 14th of January last, describing his adventures. He appears to have been disappointed with Bangweolo, finding it, instead of a lake, nothing but an immense morass. Here he waded about for nearly a month, and then launched the portable boat he had brought from Zanzibar on the Luapula, which flows out of the south side of the lake, and commenced his voyage, sending the rest of his caravan by land to Cazembe. His misfortunes soon after commenced. The Luapula describes a long curve, to the south and west, for 100 miles, before taking its definite northerly course, and at the bend, after 25 days' navigation, he was stopped by a great cataract called Mombottuta, and by swarms of hostile natives on both banks, who made the party prisoners and seized the boat. After two months' captivity he escaped and rejoined his caravan at Cazembe, but met there with little better treatment; he was plundered his goods, stores, and great part of his carbines, and had finally to fly towards Lake Tanganyika, nearly perishing of hunger by the way. Moero, on the shores of which M. Giraud passed four days hunting and fishing, he describes as a large and beautiful lake, well inclosed by its high banks. He reached Tanganyika,

where two missionaries of the London Missionary Society helped him and his party to cross to the International Station at Karema. After resting for a few months and replenishing his stores he intends to resume his journey *viâ* Murungu to the Lualaba and thence to Stanley Pool, keeping as near as possible to the 6th parallel of latitude.

The late Dr. Pogge.—We have received from Dr. Erman the following further particulars regarding the last journey of this eminent traveller, which supplement the brief sketch of his career given in the May number of the 'Proceedings.' On leaving his companion, Lieut. Wissmann, at Nyangwe, Pogge returned westward, and on the 21st of July, 1882, reached the station he had founded on his outward journey in Tushilange Land. Here he remained until the 9th of November, 1883, occupying himself in cultivating the land ceded to him by the chief Mukenge. As no news reached him in this remote spot from the Society in Germany, and his means were nearly exhausted, he decided at length to proceed to the west coast. The only information received with regard to his journey is contained in a letter which he wrote at Malange on the 2nd of February, 1884. By that letter it appears that he did not return by the shortest route; before crossing the Kassai he made a *détour* northward, and made the interesting discovery of the confluence of the Lulua with the Kassai, at a point five days' march north-north-west of Mofuka, which latter locality in Wissmann's map lies in 6° 10' S. lat. and 20° 52' E. long. From the confluence Pogge marched southward parallel to the Kassai, as far as Kikassa, the point at which he crossed the great tributary of the Congo on his outward journey. His further journey lay in a general south-west direction, passing the country of the Lunda chief Kahungula some days' march south of his route, and the Muato Cumbana, some days' to the north. Then, crossing the rivers Loange, Quilu, and Ohamba, by the same fords as those passed by Otto Schütt in 1879, he proceeded *viâ* Mashinde and Kassange, to Malange, which he reached on the 2nd of February. Here he had the great pleasure to meet again his former companion, Lieut. Wissmann, who had been to Europe since crossing the continent to Zanzibar, and was now back again in the African interior, leading a Belgian expedition to the Upper Congo. Throughout this long journey coastward Pogge suffered much from declining health, and he was now seriously ill. He had scarcely reached St. Paulo de Loanda when he was attacked by inflammation of the lungs, to which he succumbed on the 16th of March. The journals and collections made during his expedition have been taken care of by the German Consul at Loanda.

News from the Nyassa Region.—An unfortunate occurrence—the death of the Makololo chief at the hands of a European—has disturbed the peace of the Shiré and rendered unsafe for a time communication

with Lake Nyassa. Captain Foot, the English Consul, reports that the position is serious, the Makololo having, in retaliation, sunk the steamer *Lady Nyassa* with a portion of the mails.

Excursion in the Neighbourhood of Mombasa, East Africa.—Commander C. E. Gissing, our Vice-Consul at Mombasa, visited, early in the present year, the villages at the head of the creek, or arm of the sea, which penetrates, winding among the hills, about 12 miles inland from Mombasa. The hills, he says, are a continuation of those which run from Malindi, and they lie about 15 miles from the sea-coast, varying in height from 600 to 1200 feet. The country is densely covered with mimosa and thick thorny jungle, which the natives have to cut down and burn for their annual plantations. The soil is fertile, growing large quantities of Indian corn, cassava, beans, sweet potatoes, and rice. The climate is hot, but healthy. Jomvu, Mr. Wakefield's missionary station, is prettily situated on a hill close to the creek; and three miles further up is Rabbai, the station of the Church Missionary Society, built on the summit of a much higher hill, commanding a beautiful view down to the sea. The natives of the district are Wa-nika, subject to the Sultan of Zanzibar; a people who appear to have made very little progress towards civilisation. They are, however, industrious agriculturists and possess cattle, which tempt occasional raids from the brigand Masai in the interior. Of these Masai the peaceable, harmless Wa-nika live in constant dread. The Masai mode of attack is to steal up by night to a village—a collection of huts resembling haystacks, surrounded by a hedge of euphorbia—and pounce on the sleeping inhabitants just at daybreak; covered by their shields they then rush into the huts and kill every man, woman and child, sparing not even the dogs. There is a well-known mode of defence against these marauders, namely, to get in their rear, or form a ring round them, which forces them to retreat as they are unable to protect more than one side of their bodies, but the timid Wa-nika have not the courage to adopt it. From Rabbai, Commander Gissing proceeded to Ribé, where he saw the best specimen of farming he had yet observed in the country—the fields perfectly clean, the ground broken up and smoothed like a garden. The great defect of the whole district is its want of rivers and permanent water for irrigation and drinking; but in the bottoms of the valleys near Ribé there are occasional streams flowing from springs in the hills, and where these occur the vegetation is magnificent, including lofty Mfule trees with large bunches of Orchilla weed hanging from their high branches. These and other fine timber trees are plentifully festooned with the india-rubber vine, the white flowers and green leaves of which present a beautiful appearance.

Danish Expeditions to Greenland.—Lieut. Jensen, of the Royal Danish Navy, accompanied by Herr Lorenzen, geologist, and Herr Riis-Carstensen, artist, left Denmark last month for Holsteinborg, on the west coast of Greenland. Lieut. Jensen has visited Greenland for scientific purposes on three former occasions, lastly in 1879, when, accompanied by Lieut. Hammer and Prof. Kornerup, he made a careful geological survey of the country lying between Holsteinborg and Egedsminde. The object of the present expedition, the expenses attending which will be defrayed by the Government, is to work down southwards from Holsteinborg to Sukkertoppen, where the "outskirting" land between the coast-line and the inland ice is of great breadth, viz. about 80 English miles. This portion of Greenland has never been explored by Europeans, and the only accounts of it have been given by natives who state that there exist deep fiords separated by high-lying plateaux, partially covered with isolated glaciers. The expedition is expected to return to Copenhagen in October.—Another expedition to the north, in boats, along the *East Coast* of Greenland will be undertaken this summer by Lieut. Holm, of the Danish Navy.—A third expedition, for natural history investigation, consisting of Prof. Warming, botanist, and M. Holm, zoologist, is also about to leave Denmark for West Greenland.

CORRESPONDENCE.

The River Kuta of Lupton Bey.

CAIUS COLLEGE, CAMBRIDGE, *May 7th*, 1884.

SIR,—I have just read the interesting letters from Lupton Bey, published in the May number of the 'Proceedings,' and I should like to be permitted to make some remarks on the question in which their interest mainly centres, viz., where does the great river Kuta, of which he has obtained more definite information than we before possessed, flow to?

It appears that the accounts sent by Lupton very materially alter the position of this problem, and make it a still greater puzzle than before. In the first place, if we accept the identity of the Kuta with the Welle, it is settled that the latter cannot be the Aruwimi, as suggested by Stanley. Secondly, owing to the great size of the river where visited by Lupton's agent, which seems greatly increased since the lowest point hitherto known on the Welle, it is impossible, as Mr. Lupton says, to believe that it is the upper course of the Shary, a comparatively small river at its mouth.

It may, however, be a tributary of the Congo, joining the latter below its confluence with the Aruwimi—perhaps the river of Bangala, though nothing is said by Stanley leading us to suppose this of any very great magnitude, which seems necessary for its identification with the Kuta. It would be by no means improbable

that Stanley in his voyage down the Congo should have passed the mouth of a great river unnoticed, considering the way in which he was forced to keep to the inland channels, in order to avoid collision with the inhabitants on the mainland; and indeed he did see a channel, having the appearance of a river, on the right bank. On his recent expedition, however, to the Stanley Falls, when he would of course be on the look-out for large tributaries, he apparently did not discover any remarkable one, else he would probably have ascended it in preference to the Aruwimi, or at any rate have mentioned it in his letters. Another objection to the idea that the Welle-Kuta belongs to the Congo system is that it appears to trend to the W.N.W. instead of the W.S.W. as would be natural in that case.

It is now many years since the rumours of a great river flowing east and west in the district north of the Equator first reached Europe. Mr. Browne, in the beginning of the century, spoke of such in the country of Dar Kulla, which was taken by Mungo Park to be the Niger on its supposed course to the Congo. Dr. Barth also heard of the "River of Kubanda," which is evidently the Kuta; and, lastly, Dr. Nachtigal was told of the "Bahr Kuta," a river larger than the Shary, and flowing to Adamawa. These accounts, obtained from various quarters, all point to a river with a course mainly from east to west, and not turning south at about the 20th meridian to join the Congo.

The question then remains, by what channel can this river find its way to the sea? The Binuè is now out of the question, since its source has been recently discovered by the German explorer Mr. Flegel. Is it just possible that its mouth may be found in the Old Calabar river, and that the magnitude of this has been overlooked, as that of the Congo long was, owing to its narrowing as it passes through the mountain rim of the continent? I cannot find any information as to the volume of this river at its mouth, but one would think that to form such an estuary—10 or 12 miles wide for the first 30 miles from the sea—it must be considerable. Mr. Edgerley, an account of whose ascent beyond the furthest point previously known appeared in the 'Proceedings' for 1882, says that at one point it widened to over a mile broad, though beyond this he says nothing as to the size of the river.

The position in which the lake and river Liba or Riba are believed to exist would fall on the course of the river if it flowed thus, and it seems that the Old Calabar or Cross river is also called higher up Deba or Riba, which is at all events a curious coincidence.

Lupton Bey's own speculations are unfortunately influenced by his uncertainty how far north of the Equator the Congo reaches, which makes him incline to the opinion that the Kuta is the Congo—a probable view at first, when it was found that the latter flowed east and west north of the Equator, but now negatived by the fact that the Kuta flows north of 5° north latitude.

EDWARD HEAWOOD.

The Secretary, R.G.S.

REPORT OF THE EVENING MEETINGS, SESSION 1883-4.

Tenth Meeting, 28th April, 1884.—The Right Hon. Lord ABERDARE,
President, in the Chair.

ELECTIONS.—*James Stephen Barras, Esq.; Frank Herman Bicker, Esq.; W. O. Hodgkinson, Esq.; A. F. Lindeman, Esq.; James R. Lush, Esq.; Lieut.-Colonel G. Napier, B.A.; Alfred Hancock Rixon, Esq.; Lieut. H. W. Seton-Karr (92nd Highlanders); George Eustace Skliros, Esq., M.A.; Hinton Spalding, Esq.; Charles Tully, Esq., J.P.; Alfred Edward Witley, Esq., C.E.; Adam Sedgwick Woolley, Esq., C.E.*

The following paper was read by Mr. W. H. Wyld:—

“Journey from Mozambique to Lake Shirwa, and discovery of Lake Amaramba.”
By H. E. O'Neill, Esq., H.B.M. Consul, Mozambique.

Eleventh Meeting, 12th May, 1884.—The Right Hon. Lord ABERDARE,
President, in the Chair.

PRESENTATIONS.—*W. W. McNair, Esq.; Hinton Spalding, Esq.*

ELECTIONS.—*Joseph Herbert Cheetham, Esq.; Stanley Cooper, Esq.; J. F. Cornish, Esq.; Stephen Fairbairn Cotton, Esq., B.A.; George H. H. Couchman, Esq.; Charles S. Dicken, Esq.; John Edwd. Charnock Ferris, Esq. (Surgeon-Major, Indian Medical Service); Captain William Butler Ferris (Bombay Staff Corps); Rev. Edwd. Whitmore Ford, M.A.; Major-General Charles de Lantz; Richd. Kelsey Loveday, Esq.; William Lyon, Esq.; W. W. McNair, Esq.; W. Herbert Meredyth, Esq.; Joseph Messenger, Esq.; Captain A. Murray, B.A.; the Rev. S. Dowden Scammell; Henry de Morgan Snell, Esq.; H. S. Valentine, Esq.*

The paper of the evening was “The Region of the Upper Oxus.” By Robert Michell.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—May 2nd, 1884, first General Meeting of the present year: M. FERDINAND DE LESSEPS, of the Institute, President of the Society, in the Chair.—M. Huber read the report upon the awards made by the Society. This year the chief gold medal had been awarded to M. Alph. Milne-Edwards, of the Institute, Professor at the Jardin des Plantes, for his submarine explorations on board the *Travailleur* and *Tulisman*. A bronze medal would be presented to each of the colleagues of M. Milne-Edwards, and nominally to each of the vessels which had taken part in these expeditions. M. Huber asked that the captain commanding the vessel should keep this mark of esteem, which was given to the crew as a body, in the same way as the colonel of a regiment had a record on the staff of the flag that his regiment took part in certain glorious feats of arms. A gold medal had been awarded to M. Arthur Thouar for his expedition to Northern Gran Chaco and the Pilcomayo river; also a gold medal (the Logerot Prize) to M. Charnay for his archæological explorations in Central America.—The reports upon the above-mentioned expeditions were then read by the various secretaries, MM. Grandidier, Huber, and Dr. Hamy. In

his report upon the four campaigns of the *Travailleur* and *Talisman*, M. Grandidier pointed out that the works executed by the Commission upon submarine soundings and dredgings, presided over by M. Milne-Edwards, had increased in a very remarkable degree our knowledge of the conformation of the bottom of the Atlantic Ocean. This Commission had, he said, carefully examined in turn the depths of the Gulf of Gascony, the coasts of the Iberian Peninsula, the Gulf of Lyons in the Mediterranean, that part of the ocean lying between France and the Canary Islands, the West Coast of Africa as far as Senegal, and finally the Sargasso Sea between the Cape Verd and Azores Islands. Former charts had furnished but little information as to the relief of these parts of the Mediterranean Sea and Atlantic Ocean, and even this information was incorrect. M. Grandidier also showed the importance of the geological and zoological discoveries resulting from these explorations. On board the *Talisman* a sounding-machine, invented by M. Thibaudier, marine engineer, was employed. This ingenious apparatus always kept the line well suspended and indicated not only the precise moment at which the lead touched the bottom, but also the number of yards of rope unrolled. A swinging thermometer (*thermomètre à bascule*) made under the direction of M. Milne-Edwards, should also be noted. Samples of the water at various depths were collected either by means of glass tubes with thickened sides, in which a vacuum had been previously made and the tapering point of which was broken when the barometer returned, or by means of bottles made for the purpose.—M. W. Huber then read the report he had drawn up upon M. Arthur Thouar's expedition. He commenced by giving some biographical details of the young traveller. Born in 1853, M. Thouar was first employed in a bank at Rheims. During his hours of leisure he read with avidity books of travel, with a view of opening up fresh outlets for French exports. In September 1879, he started on his first voyage to study commercial questions in South America, and visited the Antilles, Mexico, Venezuela, and Colombia. From February 1881 to April 1882, he made another journey over these same countries, taking in the Republic of Ecuador. It was the knowledge thus acquired of men and things in general in South America, which enabled him to make rapid preparations for a third campaign (all these journeys were made at his own expense). As soon as the news of the death of Crevaux reached France, M. Thouar immediately formed the project of going to inquire into the causes of this disaster, and at the same time to explore the Pilcomayo river, reaching it from the west, over the Andes. M. Huber then recounted the different attempts which had been made to explore the course of this river. In 1741 Father Patiño and Father Castañares; from the year 1742 to 1844 a host of travellers had tried in vain to cross this district, which still remained unexplored, and considerable sums of money had been fruitlessly spent by the Bolivian and Argentine Governments in these expeditions. Attempts had also been made in 1844 by the Dutchman Van Nivel, 1863 by Father Gianelli, 1873 by M. Charles Maño, journalist, professor, and archæologist, who was accompanied by his wife, and in April 1882, by the Crevaux Mission, the fatal termination of which was only too well known. In 1883 M. Thouar started upon his expedition, and had brought home a complete itinerary of the course of the Pilcomayo. From this expedition it was ascertained that the upper river flowed calmly in a sandy bed; in the middle part of its course the river ran between embankments and presented some rather dangerous rapids; the lower Pilcomayo was nothing but a succession of marshes, in the midst of which it was difficult to find the real bed of the river. The result of the observations made by M. Thouar was that this river forms at certain periods a water-way for boats of small draught between Paraguay, Argentine Republic, and Bolivia. This, said M. Grandidier, was the important point established by M. Thouar. With regard

to Gran Chaco, in the deserts of which the traveller had had so much to suffer, and had been on the point of perishing with his party from starvation, he commenced his journey on foot from the last buttresses of the Andes, not far from Caiza, its capital. Towards the east it extended as far as Paraguay, on the north up to the parallel of Santa Cruz, and to the south it showed a gradual descent into the district of the Argentine Pampas. The territory designated under the name of Chaco was divided into three districts: (i.) Southern Chaco, the northern limit of which might be drawn from Corrientes to Jujuy, a district attached to the Argentine Territory; (ii.) Central Chaco, a region less known, but already traversed by a good number of expeditions; (iii.) Northern Chaco, situated on the north of the Pilcomayo, and entirely unknown. The itinerary of M. Thouar, which the Secretary had in his possession, did not yet allow of a map being prepared of the country. It was not, however, so much for the accuracy of written documents that the Society conferred its medal, as for a first sketch of a region about which geographers possessed only confused ideas.—Dr. Hamy, as secretary for M. Désiré Charnay, then recounted the various archaeological explorations made by that traveller in Mexico and Yucatan. These commenced as early as 1857, and had earned for him the Legerot prize. M. Charnay was stated to have just finished the account of his last journey, the manuscript of which the Society had in its possession.—The various awards having been presented, Captain Martial gave an account of the French scientific expedition to Cape Horn, made by the Government vessel the *Romanche*, which that officer commanded. The French mission started on July 17th, 1882, with the charge to occupy the station of Cape Horn in execution of the Weyprecht project (International Circumpolar Stations) and arrived on September 6th at Orange Bay, on the southern extremity of Tierra del Fuego. This spot was chosen by the commander for landing in consequence of its proximity to Cape Horn and the safety of its anchorage. An establishment for making magnetic and meteorological observations was erected, the different parts of which covered an area of 540 square yards (450 square metres). The archipelago of Cape Horn comprises all the group of islands which extend to the south of the Beagle Passage, from the 55th parallel to the Cape itself. These islands have been known and partly explored since the voyages of the *Adventure* and the *Beagle* by King and FitzRoy. The uncertainty, however, which exists as to the exact coast-outline of these isles, coupled with the bad weather so frequent in these parts, offers even to-day a very serious obstacle to navigation. Thus these coasts are justly feared by navigators, who are ignorant of the shelters they afford, and this want of knowledge is the probable cause of the frequent disasters of which these coasts are unfortunately the scene. From the remarks made by Captain Martial it appears that the geological constitution of this archipelago, which lengthens the American continent to the south, is the same as that of the extremity of the continent, and possesses a striking analogy with that of Norway. In both these countries deep arms of the sea stretch inland between lofty mountains which gradually slope down to the water. These fiords—as they should be called—present great depths in their inland parts, while at the entrance of them a kind of threshold is nearly always found, which is formed by masses of rock and is considerably less in depth. The natives, who inhabit Tierra del Fuego and this archipelago of Cape Horn, belong to three principal tribes: (i.) the Ofias, occupying the northern and eastern parts of Tierra del Fuego; (ii.) the Alikvolips (or Alikovlips) who dwell in the western part of the archipelago; (iii.) the Yaghanes, inhabiting both banks of the Beagle Passage and all the islands in the south of the archipelago. Throughout the whole strait natives belonging to the first of the above classes are designated the “Indiens à pied,” and those of the other two divisions the “Indiens - canots.” With the first of these tribes, which is said

to be descended from the Patagonians, it has been impossible to establish any relations. The second tribe is extremely savage. Some natives from this tribe were recently to be seen at the Jardin d'Acclimatation at Paris, but only two of the eleven who came to Europe are now alive. It was with the Yaghanes that the French mission were specially brought into relations. The Yaghane, scantily clothed with a piece of the skin of a seal or other animal thrown over his shoulder to meet the wind, living always by the fire (whence his name Fuegian) to withstand the rigour of the climate, passes his time squatting in his hut or canoe. The latter, made from bark of the beech-tree, with bands of rushes rudely joined together, is never watertight, hence it is necessary for the men to constantly empty the water which collects in the bottom. A family of from eight to ten persons can find room in one of these canoes. When returned from fishing the canoe is hauled up dry for the night. The food of the natives is solely animal, and consists of fish and birds, occasionally seals and whales when they have the good fortune to meet with them. They mainly subsist on the shell-fish which the women obtain by diving; the latter are excellent swimmers, and swim in dog fashion. The natives eat their food cooked, or rather half-cooked. M. Martial did not observe any trace of anthropophagy among them; he does not believe therefore that they eat the old women when they are in want of victuals, as represented by FitzRoy. It is unfortunately true, however, that they occasionally kill the old people of both sexes, when the latter, in consequence of their infirmities, are no longer able to take any active part in life. The race is eminently nomadic, the necessity of providing means of sustenance compelling them to be continually on the move. Gay and full of laughter, their intelligence is quick and their attention always ready, quite contrary to what was observed in those who visited France. Their intellect is well developed, but their industry is practically nil. While they are accustomed to weave rushes into baskets, and make necklaces of shell, they have no earthenware of any kind, nor do they know how to work in iron, in spite of the abundance of this metal in the rocks of the different islands. There is no trace of agriculture to be found among them. Attempts have been made to cultivate the potato, but the rearing of cattle would have more chance of success. Their powers in arithmetic are limited to counting up to three; when they require to go beyond that figure they employ the word "much." Their views with regard to the future life and the Divinity are very difficult to understand; they believe in good, and particularly in evil, spirits without appearing to attach any idea of reward or punishment to their functions. M. Martial estimates the population at from 1500 to 1800, but it is very difficult to arrive at. An English Protestant Mission established in these parts has done much to civilise the manners and customs of the natives. It is the Ooshoowáian Mission, and is superintended by the Rev. Mr. Bridges, a man, says M. Martial, of great benevolence combined with a large amount of energy and common sense, who, having acquired considerable influence over the natives, whose language he understands perfectly, is in a word "the right man in the right place." The French Expedition had good reason to be satisfied with its relations with him, thus the commander has requested the permission of the Minister of the Navy to hand over to these missionaries the huts in which the French lodged, and their instruments, during their stay at Cape Horn, whence the *Romanche* set sail on September 3rd, 1883. Like the navigators who preceded him, Captain Martial observed on the coasts an elevation of the shores resulting from either volcanic convulsions or from a slow and continuous movement. An elevation of 160 feet would be sufficient to completely close the entrance of the Straits of Magellan and that of the Beagle Channel. With an upheaval of 625 feet the American continent would be lengthened as far as the Islands of Diego Ramirez, and there would be found the new cape which it would be necessary to double in order to pass from the Atlantic into the Pacific; but long before that is realised the Panama Canal will be completed.

— May 16th, 1884: M. BOUQUET DE LA GREY, of the Institute, in the Chair.—The Chairman opened the meeting with a few remarks upon the treaty which had just been signed at Tien-tsin, but made no reference to its political significance, the discussion of politics being strictly prohibited by the rules of the Society. He intimated that the Minister of the Navy had issued instructions for making a hydrographical survey of the country, over which the Protectorate of France now extends, and stated that two engineers were engaged for the work. The Society, he said, intended to take steps in conjunction with the Government to appoint experts who would be the first to explore such an interesting district.—The General Secretary then stated that a member, lately deceased, had bequeathed to the Society a sum of 2000 francs invested in Government Funds, the interest (i. e. the interest for a certain number of years capitalised) of which was to be given to the French explorer or traveller who should get the nearest to the North Pole. The Secretary also announced the opening of a free course of lectures upon meteorology at the Faculty of Sciences of Paris, and took occasion to remark that this was the first time that meteorology had received official recognition as a science.—The Toulouse Geographical Society intimated that at the Congress of French Geographical Societies to be held in the course of a few weeks in that town, a hall would be set apart for an exhibition of busts and portraits of the principal explorers of modern times, and requested the Society to send as many exhibits as possible. The Geographical Society of Oran (Algeria) was stated to be already making preparations and taking steps to secure the meeting of these same Societies for 1885 in that town.—The Minister of the Navy and Colonies transmitted a work, which had just been published under his auspices, viz. the Report of the operations effected in West Africa from the time of the first journeys undertaken by order of General Faidherbe up to the present day.—M. Ludovic Drapeyron, editor of the 'Revue de Géographie,' presented to the Society a work published by him, in which he discusses, according to the desire expressed by M. de Lessepe, his scheme for the establishment of a national school of Geography, which project is to be submitted to the Toulouse Congress. M. Drapeyron's plan advocates the creation of thirteen professorships, where, among other subjects, instruction would be given in geodesy, practical topography, cosmography, &c.; there would also be lectures upon cartography, colonisation, ethnography, agricultural geography, &c.—News was received from Dr. Paul Neis, who is now travelling in Indo-China. A despatch, which had been forwarded to the Society, announced his arrival at Bangkok on the 28th of April. At the same time M. Harmand, late French Commissary-General in Tongking, communicated a letter received by him from Dr. Neis, and dated November 19th, 1883, from Luang-Prabang. The author there describes the extensive and fertile plateau forming but a short time ago the kingdom of the Phou'ons, which is situated between Tongking and Laos. This plateau, affording pasture for numerous herds of cattle, and, among others, a famous race of horses, possesses a rich, industrious, but cowardly and servile population, which ten years ago began to suffer invasions from the Hôa. The latter first of all established themselves on the Nam-thé, a navigable affluent of the Song-cá or Song-Má, and by means of which (according to what Dr. Neis learned from the king) a large trade was formerly carried on between Luang and Annam. The invaders continued to descend in increasing swarms every year. On the north they now hold all the towns on the Nam-thé, and have thus ruined the principal branch of the trade of Luang, which was benzoin obtained from this district. Further communications from the same traveller, which were forwarded to the Society by the Minister of Public Instruction, speak with more detail of the products of this country of the Phou'ons. It is situated on the upper courses of the Song-cá and Song-Phô, tributaries of the Gulf of Tongking, and also on

the upper parts of the Nam-San and Nam-Muon, which are affluents of the Nam Mekong. The Hôa, mentioned above by the traveller, are none other than Chinese, who have been driven to this invasion by the misery and excess of population existing in the southern provinces of China. These inroads continue regularly every year, and the Hôa are advancing by degrees farther and farther south.—M. Ch. Gauthiot, General Secretary of the Commercial Geographical Society of Paris, communicated several letters just received by that Society. One of these letters announced the formation at Buenos Ayres of a Society for assisting French emigrants, or emigrants coming from countries speaking the French language, such as Belgians and Swiss, who are desirous of settling in the states of the Rio de la Plata. Also a letter from M. F. Deloncle, giving information upon the country of Perak in the Malay Peninsula. The author speaks therein of Thâi-Pheng (or Taiping), which, although scarcely ten years old, is already a very fine town. A railway will in a few months connect this place with the coast and be continued later on as far as the province of Wellesley on the one side and Kuala-Kangsa on the other. M. de Deloncle then goes on to recount the incidents of the recent journey made by Sir Hugh Low in company with several engineers, in Upper Perak, a journey which has produced most unexpected results. Rich mines have been discovered on the banks of the Perak river. The latter, according to the expedition of Sir Hugh Low, is 200 miles long, and is without doubt destined to become the great commercial artery of the Malay Peninsula.—A communication had been received from M. Michel Venukof, but, being present at the meeting, he gave the information verbally. The subject of his remarks was a map of the heights of European Russia, which had been determined during the course of a certain number of years. More than 18,000 points, the altitude of which was known, were indicated on this map. The map, which was exhibited in the hall, had been prepared by General A. Tillo, and was accompanied, said M. Venukoff, by an explanatory report of great interest. In order that its scientific value might be better appreciated, it should be compared with the hypsometrical map of Russia by M. Ilyin. M. Venukoff further stated that the report of M. Gladycheff on the exploration of the country between the Tejend and Murghab rivers had just been published. The influence of Russia was already making itself felt in this district, for “the recent Russian maps,” said M. Venukoff, “represent it as forming part of the Trans-Caspian territory, so that the southern frontier of this territory lies at a distance of $6\frac{1}{2}$ miles (10 kilometres) from Herat. But nothing is yet known officially.” M. Venukoff thought, therefore, that in spite of the despatches announcing the annexation to Russia of Sarakhs, which would become the centre of the Tejend district, it was expedient to await a more positive confirmation.—M. Hausen-Blangsted offered some remarks upon a question, which he himself has recently raised. He stated that Cape North was not, as was generally supposed, the most northern point of Europe, but that the extreme point was Knivskjærodde. The situation of Cape North being $71^{\circ} 10' 15''$ north latitude and $23^{\circ} 31' 30''$ longitude east of Paris, and that of the promontory above-mentioned being $71^{\circ} 10' 45''$ north latitude and $23^{\circ} 20' 6''$ longitude east of Paris, there was a difference of $30''$ or 1013 yards (926 metres) in favour of Knivskjærodde.—M. Romanet du Caillaud forwarded a communication upon the first steps taken by France towards the Red Sea and Egypt. The business of the day being very heavy, the reading of the manuscript was reserved for a future meeting.—M. Virlet d'Aoust announced the constitution of a new Geographical Society, which had just been formed at Avesnes (Department du Nord), and which formed part of the “Union Géographique du Nord Français,” the seat of which was at Douai. The district of Avesnes is one of the most populous and industrious of the department.—In conclusion, M. G. Demanche made some observations upon the territory of Obock. A commission had

just defined the interior limits of this district, which, although purchased from the Danakyls in 1856, had only recently been occupied by the French Government. Works had been commenced there, and a coal depôt established. This would be a valuable station between Toulon and Saigon. The harbour, easy of access and protected from heavy seas, would serve as a shelter for ships and a place at which to re-victual; the coal mines would be a source of prosperity to the colony. The country was rich in cattle, and the climate by no means unhealthy, the heat on the coast being tempered by the sea-breeze.

Geographical Society of Stockholm.—February 15th, 1884: Consul N. A. ELFWING, the President, in the Chair.—Baron Nordenskiöld proposed that the Vega gold medal (the greatest honour at the disposal of the Society) for 1884 should be conferred on Colonel Prejevalsky, in appreciation of the services he had rendered geography, in exploring countries hitherto entirely unknown, and for his zeal in making valuable scientific collections. The proposal was agreed to unanimously. Colonel Prejevalsky is the fourth recipient of the Vega medal, the three others being Nordenskiöld, Palander, and Stanley.

— March 21st, 1884: Consul N. A. ELFWING, the President, in the Chair.—The President announced the death of two of the Society's foreign members, viz. Dr. E. Behm, the celebrated editor of 'Petermann's Geographische Mitteilungen,' and Herr Elias Lönnrot, the collaborator and interpreter of the famous Finnish Epic 'Kalevala.'—Dr. N. Ekholm, the commander of the Swedish expedition to Spitzbergen, 1882-83, next gave an account of his journey and work, the particulars of which were now collected. The speaker began by referring to the proposals for international Polar researches, which were carried into execution on September 1, 1882, and to the financial difficulties which stood in the way of Sweden participating in the scheme. The necessary funds being contributed by Herr. L. O. Smith, the well-known Swedish merchant, and he (the speaker) having been appointed its chief, the expedition left Gothenburg on June 21, 1882, in the gunboats *Urd* and *Verdandi*. Having called at Bergen and Tromsø, where three reindeer cows with calves were taken on board, Spitzbergen was sighted on July 11, and the ships entered the sound between Amsterdam Island and Danish Island, at the north-western promontory of the island, on July 15. During the following days many attempts were made to get round the ice masses piled up here and to reach the destination of the expedition, viz. Polhem, in Mossel Bay, where the Swedish expedition of 1872-73 wintered. This being found impossible, the commander decided instead, in order to be in a position to begin the researches on the day appointed, to select Cape Thorsden, in the Icefjord, for his station, where there is a block-house built by Swedes. Through incessant working after arriving there, consisting in repairing the house, building a depôt, and unloading the materials and instruments on board the vessels, the expedition was nearly ready to begin observations at the time appointed. There were, however, other difficulties in the way. Firstly, thus, measurements had to be made with a magnetic theodolite to ascertain whether the presence of a highly magnetic mineral, hyperite, contained in the adjacent mountains, would affect the instruments. This was found not to be the case. Further, it was found difficult to select a place suitable for the anemometer, the block-house standing in a valley. As any observations of the wind in the valley would be valueless, it was decided to erect the anemometer on one of the mountains, and connect it with a self-registering electrical apparatus. The magnetic observatory was erected 100 metres south-east from the dwelling-house, between the two huts containing the thermometers. The work was so far advanced on August 6 that the gunboats could depart. On August 15 the meteorological observations began, and on the 21st the magnetic ones. But

even after this date much work remained to be done, as, for instance, the building of an astronomical observatory, work-room, bath, &c. The little billiard table brought out was greatly appreciated during the winter. The provisions were found excellent, and, thanks to this and the constant use of anti-scorbutics, the health of the expedition was excellent throughout. The Polar night did not seem to affect any one, neither could any change in the circulation of the blood or deterioration of the sight be discovered. The only effect of the long darkness seemed to be a faint yellow change of the complexion, which became apparent when the sun returned. On October 15 the sun became entirely invisible. It was to reappear on February 21. A night of four months! It was, however, not night throughout the entire period, the first and last months revealing considerable light in the south at noon. The speaker then proceeded to give some account of the scientific results of the expedition, which were now made public for the first time, a description illustrated with diagrams, maps, and drawings. The lowest temperature, viz. 32° below zero of Fahrenheit, happened on January 2. The winds blew mostly from east to west or *vice versa*. Calms were very common. In this respect there was a great difference between the weather conditions at Mossel Bay during the winter 1872-73, where the weather was stormy throughout. There was, on the other hand, a remarkable similarity between the barometrical observations of this winter and that of 1882-83. The diagrams made showed curves so identical that one might assume that the conditions of the weather of 1872 and 1882 were very similar. This was, however, not the case in other places, as, for instance, in Sweden. Another meteorological phenomenon was the heating and melting of the snow in the spring. With the thermometer several degrees below zero no one would suppose that the snow could melt; but this had really been the case, and it could only be explained as being due to the effect of the reflected sunlight. The magnetic researches were not so far prepared as to be referred to. Several drawings of the aurora borealis observed were then shown by the speaker, who, finally, described the measurements which were made to ascertain the height of this phenomenon above the earth, and the studies of ebb and flood in the Icefjord. On July 8 the first post arrived from the outside world, after which several Norwegian hunters called, and on August 10 the gunboat *Urd* arrived to bring the expedition home. On August 23 the observations were discontinued, and on the 25th the expedition left Spitzbergen, arriving in Gothenburg on September 6, after an absence of nearly 15 months.—In conclusion, Capt. J. A. Ekelöf delivered a lecture on the island of Madagascar.]

NEW BOOKS.

(By E. C. RYE, *Librarian* B.G.S.)

EUROPE.

Andræ, C. G.—Den Danske Gradmaaling. Fjerde Bind, indeholdende de Astro-nomiske Iagttagelser og Bestemmelsen af Sphæroiden. Kjøbenhavn (Bianco Lunos): 1884, 4to., pp. xii. and 432, pl.

The third volume of the Geodetic Survey of Denmark was published in 1878. The present one contains a lengthy paper of observations and calculations by Dr. C. A. F. Peters on the difference of longitude between the observa-tories of Copenhagen and Altona, the former being $10^{\circ} 32' \cdot 563$ to the east; also the determination of altitude by Ramsden's zenith-sector, azimuth determina-tions, and determinations of earth-spheroids by combination of geodetic mensu-rations and astronomical observations.

This volume is accompanied by 'Problèmes de Haute Géodésie,' in three parts, extracted from the above-mentioned work, and translated into the French language.

Lenormant, François.—La Grande-Grèce: Paysages et Histoire. Vol. iii. La Calabre. Paris (Lévy): 1884, cr. 8vo., pp. vi. and 444. (*Dulau*: price 6s.)

This completes the work of which the first two volumes were noticed in our 'Proceedings,' 1882, p. 115. The late author resumed his archæological explorations in the autumn of that year, intending to complete his subject in two further volumes, but in consequence of his death in December last no more than the one now under notice will appear. It contains his notes on Nicastro, Pizzo, and Monteleone, with discussion of the topography, &c., of the ancient cities of Terina and Temesa, and of the history of old Mileto, the earthquake of 1783, and the new town of the same name. Some letters to Baron de Witte conclude the book.

ASIA.

India: North-Western Provinces.—Statistical, Descriptive, and Historical Account of the North-Western Provinces of India. Vol. vii. Farukhabad and Agra. Chiefly compiled by H. C. Conybeare, Bengal Civil Service; and edited by E. T. Atkinson, B.A., F.R.G.S., and F. H. Fisher, B.A., Lond., both of the Bengal Civil Service. Allahabad (North-Western Provinces and Oudh Government Press): 1884, large 8vo., pp. 768, 34, and Index x., maps.

The present volume is on the same scheme as those later in the series which were noticed *supra* p. 300. In addition to the areas indicated by its title, it contains a statistical and descriptive account of Jalesar Parganah and Tahsil of the Etah district, by Mr. William Crooke, of the Bengal Civil Service. The maps of Farukhabad and Agra are on the usual scale of 8 miles to the inch; there are also plans of Farukhabad city, a map of Kanauj, a plan of Agra cantonment, city, and environs ($1\frac{1}{2}$ inch to the mile), and of the principal buildings in Agra fort, a ground plan of the Taj Mahal, a plan of Fatehpur-Sikri (300 feet to the inch), and a few outline cuts.

Raverty, [Major] H. G.—Notes on Afghanistán and part of Baluchistán, geo-graphical, ethnographical, and historical, extracted from the writings of little-known Afghan and Tájizk historians, geographers, and genealogists; the Histories of the Ghúris, the Turk Sovereigns of the Dihilí Kingdom, the Mughal Sovereigns of the House of Timúr, and other Muhammadan Chronicles; and from personal observations. Printed by Order of the Secretary-of-State for India in Council. London (Eyre & Spottiswoode): 1883, fo. [8437 a. I. 3185], pp. i-ix., 317-452.

This fourth section of Major Raverty's important treatise, of which the third section was noticed in the 'Proceedings' for 1881, p. 692, contains an account

of the main routes leading into the Dera'h-ját from the city of Kábul, and from the Dera'h-ját to Kábul by Pes'háwar, with the shorter routes between Pes'háwar and Bannú and the Abáe-Sin or Indus, south of the river of Kábul. The next Section, which will conclude the work, will embrace routes leading out of the Dera'h-ját beyond our frontier towards Kábul, Ghaznín, Kandahár, and Herát, and the countries north and north-west of Kábul, and on and beyond the Oxus, of which no account has been given in these notes. Eighteen chief routes are discussed, with special separate treatment of the Marwat Afgháns of the Núhání tribe, the Daulat Khel, Ták, and Tatur Núhánís, the Dzandah-púr (Gandabpur) and Bábar Afgháns, the Biluts section of the Prangi Lodí Afgháns, the Balúch tribes between Multán and Kábul, the Khassúr tribe of Matí Afgháns, the 'Isá Khel branch of Níází Afgháns, the Níází tribe, the Bangí Khel Khataks, the Karlárni Afghán tribes of Bangas'h or Bangak'h, the Territory of Bannú and its Shítak Afgháns, and the Khatak tribe of Afgháns. Some of these subjects (for instance, the Afgháns of Bangas'h and the Níází tribe) are treated of at considerable length, especially as regards their historical aspects. As in the former parts, the text is elucidated by numerous foot-notes of historical, ethnological, and geographical value. The author's criticisms have occasionally received official obliteration.

Roepstorff, F. A. de.—A Dictionary of the Nancowry Dialect of the Nicobarese Language; in two parts: Nicobarese-English and English-Nicobarese. Edited by Mrs. De Roepstorff. Calcutta (Home Department Press): 1884, 8vo., pp. xxv., 279.

Although not a geographical treatise, this posthumous work may be fitly noticed here, as containing so much matter of importance upon the Nicobars. In an Appendix, various ethnological notes of considerable interest are given.

Satow, Ernest Mason, and Hawes, [Lieut.] A. G. S.—A Handbook for Travellers in Central and Northern Japan. Second edition, revised. London (John Murray) and Yokohama (Kelly): 1884, cr. 8vo., pp. [119] and 586, maps and plans. Price 21s.

The first edition of this work was noticed at p. 441 of the 'Proceedings' for 1881, since which date it has been included in the series of Murray's Handbooks, to which it originally bore so faithful a resemblance. The bulk of the volume is considerably increased (nearly 200 pages) by various introductory articles, the enlargement of many descriptive portions, and the addition of descriptions of the valleys of the Abekawa and Oi-gawa, of the routes from Ozaka to Nara and Tatta and from Hase to the temples of Ise, of Hakodate and excursions in Yezo, Nagasaki, and journeys in Kiu-Shiu, with much additional information on Ikao, Kusatou, &c., and completion of the routes to Nikko.

The added introductory articles are: (1) on geography and climate, by Prof. J. J. Rein; (2) and (3) Zoology and Botany, each with much specific detail, by Mr. F. V. Dickens; (4) Religions, by Mr. Satow; (5) Pictorial and glyptic art, by Mr. W. Anderson; and a notice of Japanese baths, by Dr. Baelz.

Special care has been bestowed on the preparation of the maps, most of which are based upon an excellent one compiled by the Japanese Topographical Bureau in 1860. Those of Nikko, Ikao, and Kusatou, Yezo, and Kiu-Shiu are not given in the first edition; and the two loose maps of Northern and Central Japan, instead of being mere skeletons of routes, as in that edition, are elaborated to the highest point, with the addition of physical features and names.

AFRICA.

[France in West Africa.]—Ministère de la Marine et des Colonies. Sénégal et Niger. La France dans l'Afrique Occidentale, 1879-1883. Paris (Challamel Ainé): 1884, 2 vols. large 8vo., Texte pp. 455, photograph, and Atlas of maps and plans. Price 15s.

The text, after a general exposition of the questions of the Upper Senegal and Upper Niger from the French point of view as regards occupation (commencing

with instructions from General Faidherbe in 1863), consists of a geographical, political, and commercial sketch of Western Africa, followed by chapters on the missions of Gallieni and Vallière (1879-81) before the French occupation of the Western Sûdan, on actual military operations; the explorations, topographical and scientific missions, and other works preparatory to colonisation; the creation of a commercial colony at Bammako; political necessities below and above that point; and the means of communication between the Upper Senegal and Upper Niger. A treaty with the Sultan of Segou, the languages of the Upper Senegal, the breeds of horses on it and the Upper Niger, and statistics of the population of Senegal and the Western Sûdan, are discussed with other matters in the Appendix. The details of the chapter on explorations are naturally of geographical interest; though not supplying any great result, they have enabled various route maps, plans, &c., to be prepared with accuracy. The scientific results appear to be very small, owing to the deaths of M. Berthelot and Dr. Faucon, and apparently consist only of meteorological observations by Dr. Dupouy at Kita. The frontispiece of this volume is a photograph of the bridge of Paparaha on the railroad in construction to connect Kayes and Bafulabé.

The atlas contains an index map of Africa, referring to the map on the scale of 1 : 2,000,000 by Capt. R. de Lannoy de Bissy, Dépôt de la Guerre, commenced in 1875, and of which the south as far as Tati and the west from Cape Blanco to Coomassie have been published; also a map by Lépinay of the Western and Central Sûdan (scale 1 : 5,000,000), and maps of St. Louis, Timbuctoo, Free Town, and Segou Sikoro, being sheets 16, 17, 23, and 24, issued by the Dépôt de la Guerre. There are also plans of fort Bafulabé and environs (1 : 35,000), fort Badumbé (1 : 15,000), and the environs of Kita (1 : 25,000) and Bammako (1 : 50,000), with various drawings of elevations, &c.

Pouyanne, J.—Note sur l'établissement de la Carte au 1 : 2,000,000^e de la Région comprise entre le Touat et Timbuktu. Publiée par Ordre de M. Tirman, Gouverneur Général Civil de l'Algérie. Alger (Imprimerie Cheniaux-Franville): 1883, 8vo., pp. 102, map.

The Library is indebted to Mr. James Jackson, of the Société de Géographie, for the above Note, of which a few copies were received for distribution from the Government of Algeria. M. Pouyanne was intrusted by the French Minister of Public Works with the task of discovering the best direction for a trans-Saharan route to the west of Algeria, and he has been enabled to satisfy himself on this point by direct observations as far as a little to the south of Mograr, and thence by collected information to the limit of the Tuât. The further area lying between the Tuât and Tidikelt on the north and Timbuctu and Gogo on the south has received special attention, M. Pouyanne having revised and minutely discussed all documents bearing upon it, and given the result of his labours in the map annexed to his notes. This differs materially from the author's former map of 1881, especially in the environs of Timbuctu, and in a different interpretation of Barth's work, the new rendering of which accords (undesignedly) with the last delineation by Petermann of the region, from his re-reading of the same authority. The bases of this new map are the lower Tuât and Tidikelt from the author's former map (chiefly supplied by Gerhard Rohlfs), the course of the Niger from Barth, and the positions of Arawan and Taodenni from Caillière's itinerary. Further points beyond the scope of the map, but affecting its value as representing bases supplied by skilled European observers, exist in the positions of Agades and Neswa (from Barth), and Idelès (from Duveyrier); and the details of the interior, obtained from other sources, are considered by the author as capable of being fitted to these with sufficient probability of accuracy.

The notes are divided into 7 sections: 1, concerning the environs of Timbuctu; 2, the position of Inziza; 3, routes from the Tuât and Tidikelt to Timbuctu; 4, route from Inziza to Gogo and Adrar of the Awelimmiden; 5, the region between the Tuât, Tidikelt, and Tanezrûft; 6, on M. Sabatier's hypothesis (with which the author does not agree), that the Wady Messâûd, south-west of Tuât, is continuous with the Wady Ahennet, and possibly runs on

to the Niger through the Wady Eghazar to the south; and 7, conclusions. In discussing the fourth of these headings, M. Pouyanne remarks that any European power desiring to have permanent establishments where its own people could live in the Sûdan or neighbouring countries, must be careful not to place them on the banks of the rivers, the unhealthiness of which is so great as to demand a very frequent renewal of the personal staff, and is, moreover, not capable of amelioration, except by the persevering efforts of many generations. Adrar, however, being a vast hilly country, relatively elevated, and receiving the rains under conditions very analogous to those of Algeria, appears to him to be the best district for such an object, and the superior power of its tribes is referred to as a proof of its fitness for a station.

The author's conclusions consist of a brief exposition of his views as to the best trans-Saharan road from Western Algeria; he considers that at the worst it could be constructed at a length of 1350 kilometres from Regganto the Niger (2600 kilometres from Oran) with no natural difficulty to overcome except that of water in Tanezrûft, if that way were selected. An annex to these notes contains various extracts referring to routes, &c., by Laing, Richardson, Barth, Duveyrier, El Warani, and Largeau, with more recent native information at some length.

Pringle, M. A.—Towards the Mountains of the Moon. A Journey in East Africa. Edinburgh and London (W. Blackwood & Sons): 1884, 8vo., pp. xxx. and 386 [no index], map. Price 12s. 6d.

A misleading title is avowedly given to this interesting volume, lest it should be taken for a work solely on missionary subjects. It is the narrative by Mrs. Pringle of a journey to Blantyre, the seat of the Church of Scotland Mission on the Shire, which she undertook at short notice with her husband, who was appointed by the Committee of Management to inquire into the circumstances causing the return of the Rev. Duff Macdonald, whose work, 'Africana,' noticed in our 'Proceedings' for 1883, p. 182, practically covers the same ground and subject. The incidents of the journey to Quillimane (also down the coast to Delagoa Bay and back), up the Quasqua and across the intervening strip to the Zambesi by the Mutu, and then up the Shire to Blantyre, are told with considerable vivacity, and the authoress enables a good idea to be formed of the present condition of the country and its white and native inhabitants.

POLYNESIA.

Turner, George.—Samoa a hundred years ago and long before. Together with notes on the Cults and Customs of twenty-three other islands of the Pacific. With a preface by E. B. Tylor, F.R.S. London (Macmillan): 1884, post 8vo., pp. xvi. and 395, maps and illustrations. Price 9s.

Practically a recasting of the author's well-known 'Nineteen Years in Polynesia,' published in 1861, without the personal and missionary part of the narrative, and with special attention to anthropology and ethnology. Ethnological and other notes are added on twenty-three islands or groups in the Pacific, besides Samoa; and the Appendix contains a few meteorological observations and a list of 132 words in 59 Polynesian dialects.

NEW MAPS.

(By J. COLES, *Map Curator R.G.S.*)

WORLD.

Florenreiche der Erde, Die——. Von O. Drude.

Tafel I. enthält: Das ozeanische, nordische, indische, südafrikanische und antarktische Florenreich sowie Areale beschränkter Pflanzenordnungen.

Tafel II. enthält: Die Florenreiche von Innerasien, dem mittleren Nordamerika, dem tropischen Afrika, Australien und dem mittleren Südamerika.

Tafel III. enthält: Die Florenreiche der Mittelmeerländer und des Orients, von Ostasien, dem tropischen Amerika, den ostafrikanischen Inseln und Neuseeland. Petermann's 'Geographische Mitteilungen,' Ergänzungsheft No. 74. Justus Perthes, Gotha, 1884. (*Dulau.*)**Oesterreichisch-Ungarischen Consularämter**——. Kartographische Uebersicht der kaiserlich und königlich——. Im Auftrage des hohen kaiserlich und königlichen Ministerium des Aeusseren entworfen vom Civil-Ingenieur Otto Passler. Artaria & Comp., Wien, 1884. Price 4s. (*Dulau.*)

EUROPE.

Europa——. Praktische Geschäfts und Reisekarte sämtlicher Staaten von—— enthaltend die vorzüglichsten Strassen-Verbindungen mit Angabe der Distanzen und der bestehenden Eisenbahnen. Nebst einem Theile von Africa u. Asien, und zwar die Länder: Marocco, Algerien u. Tunis, ganz Kleinasien, und ein Theil von Persien. Nach den neusten und besten Materialien bearbeitet von R. A. Schulz. Scale 1:4,400,000 or 60·2 geographical miles to an inch. Artaria & Co. Wien, 1884. Price 10s. (*Dulau.*)**France**——. Carte de—— à l'échelle de 1:1,250,000 or 17·1 geographical miles to an inch. Contenant le relief du sol, les voies de communication, les chemins de fer, les routes et canaux etc. dressée sous la direction de Vivien de Saint-Martin. Hachette, Paris. 4 sheets. Price 12s. (*Dulau.*)**London**——. Johnston's Map of the proposed City and County of——, showing the division into Districts with the number of Representatives to each. Scale 1:63,360 or 0·86 geographical mile to an inch. Johnston's Geographical Establishment, London, 1884. Price 6d.**Mähren und Schlesien**——. Nationalitätenkarte von——. Scale 1:750,000, or 23·9 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Seite 161. Justus Perthes, Gotha. (*Dulau.*)**Russischen Reichs in Europa**——. Karte der——, von J. M. Ziegler. Scale 1:4,475,000, or 61·3 geographical miles to an inch. Hinrichs, Leipzig. 2 sheets. Price 2s. (*Dulau.*)**Russlands, Die Eisenbahnen**——. Scale 1:6,000,000 or 82·1 geographical miles to an inch. Bearbeitung u. Druck v. G. Freytag. Artaria & Co., Wien, 1884. Price 2s. (*Dulau.*)**Russland**——. Uebersichtskarte vom westlichen——, in 4 Blättern im Massstabe 1:1,750,000, or 23·9 geographical miles to an inch, bearbeitet von G. O'Grady Hauptmann à la suite der III. Ingenieur-Inspection, Lehrer an der Kriegsschule zu Kassel. Theodor Fischer, Kassel. Blatt 1, 2. Price of the complete map on 4 sheets. 12s. (*Dulau.*)

Sweden.—Sveriges Geologiska Undersökning:—Ser. A. a. Nos. 89 and 90, 'Svenska Stenarne,' 'Svenska Högarna.' Scale 1:50,000, or 1·4 inches to a geographical mile.

Ser. A. b. No. 7, 'Borås.' No. 9, 'Särö.' Scale 1:200,000, or 2·7 geographical miles to an inch.

Ser. B. b. No. 3. Karta öfver Berggrunden inom de Malmförande Trakterna. I. Norra delen af Örebro Län. Utförd på Bekostnad af Jernkontoret genom 'Sveriges Geologiska Undersökning.' Åren 1872–1882. Södra Bladet. Scale 1:100,000, or 1·3 geographical miles to an inch. With pamphlets. Stockholm. (*Dulau.*)

ORDNANCE SURVEY MAPS.

Publications issued from 1st to 31st January, 1884.

1-inch—General Maps:—

SCOTLAND: Sheet 90 (in outline); Sheets 62, 100 (with Hills), 1s. 9d. each.

6-inch—County Maps:—

ENGLAND: **Bedfordshire** (part of): Quarter sheets, 8 N.W., 8 N.E.; 9 N.W.; 13 N.W., 13 S.E.; 17 N.W.; 18 N.W.; 21 N.W., 21 S.W.; 1s. each. **Cornwall** (part of): Quarter sheets, 6 S.E.; 7 N.E.; 8 N.W., 8 N.E.; 9 N.W., 9 N.E., 9 S.W., 9 S.E.; 16 N.W.; 17 N.W., 17 S.W.; 22 N.W.; 23 N.W., 23 N.E.; 30 N.W., 30 S.W.; 1s. each. **Gloucestershire** (part of): Quarter sheets, 14 N.W. with 57 N.W. (Worcestershire), 14 N.E. with 57 N.E. (Worcestershire), 14 S.E. with 57 S.E. (Worcestershire), 14 S.W. with 57 S.W. (Worcestershire); 18 S.W.; 25 N.W., 25 N.E.; 32 S.W.; 47 N.W.; 1s. each. **Hertfordshire** (part of): sheet 23 filled in with parts of sheets, 22, 23, 31, 32 (Co. Essex), 2s. 6d. **Norfolk** (part of): Quarter Sheets, 50 N.E., 50 S.W.; 73 N.W.; 93 N.E.; 95 N.W.; 96 N.W., 96 S.E.; 103 N.W., 103 S.W. with 14 S.W. (Co. Suffolk); 105 N.E., 105 S.E.; 1s. each. **Northamptonshire** (part of): Quarter Sheets, 56 N.E., 56 S.W., 56 S.E.; 57 N.W., 57 N.E., 57 S.W.; 58 S.W., 58 S.E.; 59 N.W.; 1s. each. **Nottinghamshire** (part of): Quarter sheets, 39 N.W., 39 S.W.; 40 S.W., 40 S.E., with 1 S.E. (Leicestershire); 42 S.E.; 43 N.W., 43 N.E., 43 S.W., 43 S.E.; 46 N.W., 46 N.E., 46 S.W., 46 S.E.; 49 N.W. with 10 N.W. (Leicestershire), 49 N.E. with 10 N.E. (Leicestershire), 49 S.E. with 10 S.E. (Leicestershire); 1s. each. **Shropshire** (part of): Quarter sheets, 2 S.E.; 5A S.E.; 6 N.W., 6 N.E.; 9 S.E.; 12 N.E.; 55 S.E.; 62 S.W.; 65 S.E.; 70 S.W., 70 S.E.; 71 N.W., 71 S.E.; 72 N.W., 72 N.E., 72 S.W.; 83 N.E.; 1s. each. **Staffordshire** (part of): Quarter sheets, 1 S.W.; 45 S.W.; 55 S.W.; 55 S.E.; 56 N.W., 56 S.W.; 59 N.W.; 1s. each. **Suffolk** (part of): Quarter sheets, 14 S.W. with 103 S.W. (Co. Norfolk); 23 N.E.; 27 N.E., 27 S.W., 27 S.E.; 33 S.W.; 34 N.W.; 38 N.E.; 1s. each. **Worcestershire** (part of): Quarter sheets, 7 S.W., 7 S.E. with 73 S.E. (Staffordshire); 10 S.W.; 11 N.W. with 19 N.W. (Warwickshire), 11 S.W. with 19 S.W. (Warwickshire); 14 N.W., 14 N.E., 14 S.W., 14 S.E.; 15 N.W., 15 N.E., 15 S.W.; 16 N.W., 16 N.E., 16 S.E.; 17 N.W. with 24 N.W. (Warwickshire); 21 N.E.; 22 N.W.; 53 N.E. with 10 N.E. (Gloucestershire); 57 N.W. with 14 N.W. (Gloucestershire); 57 N.E. with 14 N.E. (Gloucestershire), 57 S.W. with 14 S.W. (Gloucestershire), 57 S.E. with 14 S.E. (Gloucestershire); 1s. each.

25-inch—Parish Maps:—

ENGLAND: **Cornwall**: St. Cleer, 27 sheets; St. Ives, 12. **Derby**: Church Gresley, 15 and Ar. Bk.; Lullington, 9 and Ar. Bk.; Rosliston, 5 and Ar. Bk.; Stapenhill, 11. **Norfolk**: Ashwellthorpe, 4; Merton, 6; Riddlesworth, 4; Saxlingham Thorpe and Saxlingham Nethergate, 4; Scoulton, 7; Shotesham St. Mary, 7. **Shropshire**: Astley Abbots, 10; Denxhill, 3 and Ar. Bk.; Tasley, 4 and Ar. Bk. **Stafford**: Hanbury, 26. **Suffolk**: Campsey Ash, 6 and Ar. Bk.; Fakenham Magna, 8 and Ar. Bk.; Knettishall, 4 and Ar. Bk.; Pettistree, 6 and Ar. Bk.

Town Plans—5 feet scale:—

IRELAND: Belfast (revised). Sheets, 33, 39, 40; 2s. each.

Index Maps—

Index to the County of Denbighshire (scale 2 miles to 1 inch); 2s. 6d.

ASIA.

Ottoman Empire.—Nouvelle Carte générale des Provinces Asiatiques de l'Empire Ottoman (sans l'Arabie), dressée par Henri Kiepert. Scale 1:1,500,000 or 20·4 geographical miles to an inch. Dietrich Reimer, Berlin, 1884. Price 10s. (*Dulau.*)

In addition to the larger map, a sketch on a reduced scale is given, on which all boundaries of the administrative divisions are approximately laid down; it also contains copious marginal notes with reference to the subdivisions. This map would seem to have been compiled with great care from all the most recent authorities.

Tonkin.—Carte pour suivre l'expédition du —, à l'échelle de 1:8,000,000 or 109·5 geographical miles to an inch. Andriveau-Goujon, Paris. Price 2s. 6d. (*Dulau.*)

AFRICA.

Aegyptisch-Aebessinischen Grenzgebiet.—Itinerar-aufnahmen im —, ausgeführt von Josef Menges, Januar bis April 1881, nach den Tagebüchern und Skizzen entworfen und gezeichnet von B. Hassenstein. Scale 1:500,000 or 6·8 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Taf. 8. Justus Perthes, Gotha. (*Dulau.*)

Afrika.—Karte von — in 4 Blatt von R. Andree und A. Scobel. Scale 1:10,000,000 or 136·9 geographical miles to an inch. 1884. Ausgeführt in der Geographischen Anstalt von Velhagen und Klasing in Leipzig. Price 1l. (*Williams and Norgate.*)

Algérie.—Carte de l'—, dressée au Dépôt de la Guerre. Paris, 1876. Revue en 1882. Scale 1:800,000 or 10·9 geographical miles to an inch. Tirage de Décembre 1883. 4 sheets. Price 2s. 6d. (*Dulau.*)

Bamako.—Etat de —. Carte dressée par ordre de M. le Col. Borgnis-Desbordes 1882-1883. Scale 1:50,000 or 1·4 inches to a geographical mile. Price 8s. (*Dulau.*)

Gold Coast Colony, Map of a portion of the Western Province of the— with the River Ancobra, showing the concessions belonging to the African Consolidated Mines, Limited. Compiled by R. B. N. Walker, F.R.G.S., F.G.S., &c., and Edward W. Bonson. Scale 1:145,000 or 2 geographical miles to an inch. Lithographed by McCorquodale & Co., Limited. London, 1884.

This is a map which will be useful to those who are interested in the mining industry of the Gold Coast Colony; it also contains a considerable amount of information with regard to the topography and hydrography of the country. Mr. Walker does not state, in the title, whether he has fixed any of the positions given by astronomical observations, but as he received the necessary instruction for doing so at the Society's observatory before his last visit to Africa, it is to be presumed that he has, and should this be the case it will add materially to the value of the map.

Kamerun Gebiete, St. von Rogozinskis Reisen im—August bis Oktober 1883. Nach der Originalkarte des Reisenden u. älteren Quellen gez. von Bruno Hassenstein. Scale 1:800,000 or 10·9 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Tafel 7. Justus Perthes, Gotha. (*Dulau.*)

Madagascar.—Carte de—, dressée par A. Grandidier en 1872 à l'échelle de 1 : 6,000,000 or 82·1 geographical miles to an inch. Revue en 1884. Paris. Price 2s. (*Dulau.*)

Niger, Carte du—, dressée d'après la carte de M. de Lannoy, Capitaine du Génie et les renseignements fournis par MM. le Colonel Borgnis-Desbordes, les Capitaines de Lanneau, Pietri, Vallière et le Dr. Bayol. Scale 1 : 500,000 or 6·8 geographical miles to an inch. Fait et dessiné sous la direction du Général Faidherbe, par le Capitaine du Génie Ancelle.

The only points in this map which have been fixed by astronomical observations are Timbúktu, Segou and Bamaku, and the course of the river is therefore in many portions general and hypothetical. Great pains, however, have evidently been taken in its compilation, and it contains a large amount of information with reference to the population, the disposition of the inhabitants, their religion, articles of produce, and the caravans which are permitted to pass through the respective regions; in fact the notes alone which are given on this map would be of great service to any explorer in the country around the Upper Niger, and it also contains more information as to the hydrography of the country than has ever before been published. The scale, 7 geographical miles (nearly) to an inch, is quite large enough for all practical purposes.

São Thome.—Ilha de—. Von Prof. Dr. R. Greeff und Francisco José de Aranja. Scale 1 : 250,000 or 3·4 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Tafel 6. Justus Perthes, Gotha. (*Dulau.*)

Sudan.—Map of the Nile, embracing the Sudan, Abyssinia, the Red Sea, and Western Arabia. Scale 1 : 4,145,000 or 57·5 geographical miles to an inch. Price 1s.

— Map of Part of Eastern Sudan, Kordofan, Abyssinia, &c. From the latest Surveys and Explorations. Scale 1 : 1,800,000 or 24·6 geographical miles to an inch. Price, in sheet, 2s. 6d., folded in case, on linen, 4s. 6d.

— Bird's Eye View of the Sudan. Price 1s.

Letts, Son & Co., Limited. London, 1884.

Tana-Gebietes.—Originalkarte des Unteren—. Nach eigenen astronomischen und geodätischen Messungen gezeichnet von Clemens und Gustav Denhardt. Scale 1 : 500,000 or 6·8 geographical miles to an inch. Zeitschr. der Ges. f. Erdk. zu Berlin, Bd. xix, Taf. 3. Dietrich Reimer, Berlin. 1884. (*Dulau.*)

Transvaal Republic.—General Plan of Gold and other Farms, situated in the District of Lydenburg, Transvaal Republic, by W. Prosser, F.G.S., June 1883. Saul Solomon and Co., Cape Town.

This map, being without graduation, and not drawn to any given scale, can only be of service to those who already possess local knowledge.

AMERICA.

Alaska and adjoining Territory.—Map of—. Compiled from all accessible data by W. H. Dall, Assist. U.S.C.S., and including results of recent explorations by Capt. L. A. Beardslee and Lieut. R. Berry, U.S.N.; Lieuts. Ray and Schwatka, U.S.A.; Capt. C. L. Hooper, U.S.N.M.; the officers of the 'Vega' expedition and of the Coast Survey; Drs. Arthur and A. Krause; Messrs. Nelson, Petroff, Turner, Sands, McGlinchey, Herendeen, and others. Scale 1 : 3,029,500 or 41·5 geographical miles to an inch. Drawn by H. Lindenkohl. U.S. Coast and Geodetic Survey, J. E. Hilgard Supt. Re-issued with additions in April 1884.

A great proportion of the detail contained in this map has never been published before, and adds considerably to our knowledge of Alaska. The map

of the same region compiled by Ivan Petroff in 1882 has been largely used in the present one, but there are numerous corrections and additions; among the latter may be mentioned the soundings for a considerable distance from the coast.

Manitoba and Hudson's Bay Railway.—Map showing proposed Route of the—. With a table of distances. Dr. R. Bell, M.D., F.G.S. Bishop & Co., Winnipeg.

CHARTS.

Admiralty.—Charts and Plans published by the Hydrographic Department, Admiralty, in March and April 1884.

No.		Inches.		
2137	m	= 0·35	Eastern archipelago:—	Gaspar strait. Price 2s. 6d.
894	m	= 3·0	Greece, east coast:—	Salamis strait and Giorgio channel. Price 6d.
663	m	= various	Ireland, east coast:—	Malahide inlet. Rogerstown inlet. Skerries. Drogheda entrance. Price 1s. 6d.
2887	m	= 0·7	North America, west coast:—	San Pablo and Suisun bays including Mare island and Karquines straits. Price 1s. 6d.
637	m	= 1·24	Newfoundland, south coast:—	Harbours and anchorages on the north coast of Fortune bay. Price 1s. 6d.
284	m	= 0·3	Newfoundland, west coast:—	Cow head harbour to St. Genevieve bay, with the Canadian and Labrador coasts between Great Mecattina island and Amour Point. Price 2s. 6d.
615	m	= 1·0	New Zealand, Middle island:—	George, Bligh, and Milford sounds. Price 2s.
1443	m	= 6·8	Scotland, east coast:—	Stonehaven bay. Price 1s.
2393	m	= 3·5	England, west coast:—	Milford haven. Price 2s. 6d.
1438	m	= 6·9	Scotland, east coast:—	Peterhead. Price 1s. 6d.
1439	m	= 6·9	Scotland, east coast:—	Fraserburgh. Price 1s. 6d.
2531	m	= 0·07	North America, west coast:—	Cape Mendocino to Vancouver island. Plans, Humbolt bay. Cape Orford reef. Koos river. Umquah river. Yaquina river. Gray harbour. Duncan rock and cape Classet. Price 2s. 6d.
202	m	= various	Japan:—	Harbours and anchorages on the east coast of Nipon. Kama-i-shi harbour. Siriya-saki anchorage. Ai-kawa anchorage. Inu-bo-ye and Tone Gawa. Kats' Ura bay. Price 1s. 6d.
1809	m	= 0·18	Africa, east coast:—	Mozambique harbour to Ras Pekawi. (Plans, Ibo harbour. Pomba bay. Almeida bay. Fernando Velosa bay.) Price 2s. 6d.

(J. D. Potter, agent.)

CHARTS CANCELLED.

No.		Cancelled by	No.
2137	Gaspar strait	New charts, Gaspar strait	2137
1513	Plan of Giorgio channel on this chart	New plan, Salamis strait and Giorgio channel	894
2887	Mare island and Karquines straits		

No.		Cancelled by	No.
1443	Stonehaven and Johns haven ..	New plan, Stonehaven bay ..	1443
2393	Milford haven	New plan, Milford haven	2393
1438	Peterhead	New plan, Peterhead	1438
1439	Fraserburgh	New plan, Fraserburgh	1439
2531	Cape Mendocino to Vancouver island	New chart, Cape Mendocino to Vancouver island	2531
208	Harbours and anchorages on the east coast of Nipon	New plans, Harbours and anchorages on the east coast of Nipon	208
1809	Mozambique to Pomba bay	New chart, Mozambique harbour to Ras Pekawi	1809
656	Pomba bay		
657	Pomba bay to Ras Pekawi		
1768	Ibo harbour		

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No. 2576. Eastern archipelago:—Sulu archipelago and the north-east coast of Borneo. 1630. England, east coast:—Orfordness to Cromer. 102. England, east coast:—Pakefield gateway to Orfordness. 1069. Australia, east coast:—Port Jackson. 2431. North America, west coast:—Port Simpson to Cross sound. 2459. North-west Pacific ocean. 2556. France, north coast:—Calais. 2694. France, west coast:—The channels between Ile d'Ouessant and the mainland. 1513. Mediterranean, Greece:—Salamis and Eleusis bays. 928. Eastern archipelago:—Sulu archipelago. 1709. Prince Edward island:—Charlottetown harbour. 1480. China:—Yang-tse-Kiang to Nanking. 1199. China:—Kweshan islands to the Yang-tse-Kiang. 2172. North America, west coast:—Behring strait. 287. Borneo, north coast:—Gaya bay to Sandakan harbour. 1008. Cochin China:—Davaich head to Hone Gomme. 1055. Australia, west coast:—Bedout island to cape Cuvier. 599. Africa, west coast:—Cape Verde to cape Roxo. 1231. Africa, west coast:—Cape Blanco to cape Verde. 1228. Africa, west coast:—Azamor to Santa Cruz. 1229. Africa, west coast:—Santa Cruz to cape Bojador. 2763. Australia, north-east coast:—Coral sea and Great Barrier reef, sheet 1. 29. South Pacific ocean, Rapa or Oparo island:—Ahurei bay. 1048. Australia, north-west coast:—Buccaneer archipelago to Bedout island. 397. Africa, west coast:—Volta river 2246. Baltic sea:—Port Baltic to Hogland. 2245. Baltic sea:—Hogland to Seskär, south shore. 2247. Baltic sea:—Hogland to Seskär, north shore. 2298. Baltic sea:—Wirmo fiord to Sodra Björko. 2301. Baltic sea:—Umea light to Tome point. (*J. D. Potter, agent.*)

Adriatischen Meeres, Küstenkarte des—, herausgegeben vom hydrograph. Amt. der k. k. Kriegsmarine-Seekarten-Depôt Pola. No. 1, Golf von Triest. No. 2, Umago und Parenzo. No. 3, Orsera und Rovigno. No. 4, Pola. No. 5, von Golf Medolino. Triest. Price 1s. 6d. each sheet. (*Dulau.*)

Ancon, Bahia de.—Costas del Perú. Levantado por los Oficiales de la Corbeta italiana Vettor Pisani al mando de su Comandante G. Palumbo, 1883. Scale 1:80,000 or 1 geographical mile to an inch. Hidrografia Oficial, Chile, 1884, No. 29.

North Atlantic Ocean.—Pilot Chart of the—. No. 6, May 1884. Equatorial scale, 3·7 degrees to an inch. Prepared by order of the Bureau of Navigation; Commander J. R. Bartlett, U.S.N., Hydrographer. U.S. Hydrographic Office, Washington D.C.

ATLASES.

Mager, H.—Atlas colonial dressé et dessiné par—. Ch. Bayle et C^o, Paris. fascicule. Price 2s. 6d. (*Dulaeu*.)

Saint-Martin, Vivien de.—Atlas Universel de Géographie Moderne, Ancienne, du Moyen Age, construit d'après les sources originales et les documents les plus récents, cartes, voyages, mémoires, travaux géodésiques, etc. Avec un Tableau Analytique par M. Vivien de Saint-Martin et Fr. Schrader. Environ 110 cartes gravées sur cuivre sous la direction de MM. E. Collin et Delaune. 4^e Livraison contenant, Russie occidentale et Roumanie, 1 : 3,500,000.—Mexique, 1 : 5,000,000.—Region polaire antarctique, 1 : 25,000,000. Paris : Librairie Hachette et C^o. Price of this part, 5s. (*Dulaeu*.)

This is the fourth issue of the 'Atlas Universel,' which was commenced in 1877; the previous issue was in January 1881; thus of an Atlas which will be complete is to contain 110 maps, only ten and two astronomical charts have been published. At the present rate of publication, it will take no less than sixty-four years to complete this Atlas—and indeed some of the sheets already issued are now out of date as regards the changes that have taken place at the frontiers. This is to be regretted, as the maps are beautiful specimens of cartography, and the Atlas, if completed within a reasonable time, would certainly be second to none.

The Notice which is published with these maps gives the authorities to which they are based, and the reasons for departing from such authorities where better information has been available. The map of Mexico is particularly worthy of notice as containing several important additions and corrections. Every effort would appear to have been made to obtain the best possible material in the construction of all the maps in this Atlas, and this only adds to the regret which is felt at the tardy manner in which it is being issued.

EDUCATIONAL.

Physiography.—Johnston's Standard Series of Illustrations. *Physiography*, Coal, Coal Mines and Volcanoes, with Key. Price 1l. 1s. *Physiography*, Physical Geography, with Key. Price 1l. 1s. Published by A. Johnston, London. Mounted on rollers and varnished.

Diagram No. 1 is intended to illustrate the working of a coal mine, the manner in which the miners reach the coal, how they work it, and the means used for bringing it to the surface. The various implements employed are shown as well as the methods of ventilating the pit, mapping out the progress made, and the supporting of the earth above. A map of the British Coal Fields is given, and several illustrations showing the position of the coal-bearing strata.

There are altogether on this Diagram 49 illustrations bearing on this subject, and 7 illustrations of volcanoes, earthquakes, geysers, &c.

Diagram No. 2 illustrates by 78 coloured diagrams the position and action of water in its many forms of clouds, rain, snow, ice, glaciers, rivers, springs, wells, &c., also the mirage, aurora, sandstorms, and waterspouts, climate by elevation, and geology in many of its bearings, viz. :—Theoretical section of the earth's crust, sections of continents, general view of the British strata, old sea beaches, fossils from various strata, granite, basaltic columns, stalactites, chalk, coal, earth pillars, pitch lake, salt mine, &c.





PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

The Annual Address on the Progress of Geography: 1883-4.

By the Right Hon. LORD ABERDARE, F.R.S., President.

(Delivered at the Anniversary Meeting, May 26th, 1884.)

THE Annual Report of the Council of this Society, which you have just heard, would appear to indicate a growing interest in the study of geography, and in geographical enterprise. A greater number of members have joined us than for several preceding years; our receipts are increasing; upwards of twenty travellers have, we were told, received instruction through the Society's officer in practical astronomy and route-surveying; and these gentlemen have either proceeded, or were about to proceed, to dimly-known regions in all quarters of the globe. And such has been the desire of intending travellers to qualify themselves for accurate scientific observation, that the Council are engaged in taking measures for providing additional training in such subjects as geology, botany, and other allied sciences; so that every year we may expect an increasing number of accomplished travellers to leave these shores in search of countries unknown, little known, or imperfectly described.

And this ardour in the pursuit of geographical knowledge is by no means confined to Great Britain. The accomplished and eloquent President of the Italian Geographical Society has recently, in his Annual Address, drawn attention to the rapid and extraordinary increase in Geographical Societies all over the world. In 1830, there existed but three; those of Paris, Berlin, and London. In 1867 they numbered 16; in 1882 no less than 79 were enumerated in Behm's 'Jahrbuch,' and since then several more have been founded. Of these, nine are in America; no less than six in Asia, one of them being in Japan; while even Africa supports five. This remarkable growth may in part be accounted for by the enlarged education and increasing intelligence of mankind, which inspire a keener and more vivid interest in all branches of human knowledge. We know how many of the most interesting sciences are sub-

served and promoted by the accurate observation and description of the earth's surface, its people, its *fauna*, its products. Much also of this increasing interest is doubtless due to the conviction that such knowledge is especially desirable among nations which aspire to political and commercial eminence. And if this is true of all civilised nations, with what special stringency does it apply to us, who have inherited the vastest empire in extent, the most widely distributed in its area, the most diversified in the races which inhabit it, the richest and most varied in its industrial products, that the world has ever yet seen? More than any people we depend upon the intelligence and knowledge of our commercial leaders; it seems a condition of our existence—at any rate, of our existence in the foremost rank of nations—that we should be constantly finding and making fresh markets for those goods which the ceaseless energy of our people is producing in constantly increasing quantities, and which with a devouring activity they strive to introduce into every creek and inlet and river on the navigable globe. It is a race in which we cannot afford to occupy any but the first place. Among such a people would it not be reasonable to suppose that the study of political and commercial geography would form an essential part of a liberal education? We know, however, by sad experience, how far this is from being the case; and many of you have doubtless read with no less astonishment than regret that the Council have been compelled to admit the failure of their attempt to introduce the study of physical and political geography into the *curriculum* of our public schools. Very few schools have competed for our prizes, which have been annually carried off, with slight competition, by the pupils of the same institutions. We have therefore abandoned that scheme; but we have by no means renounced the hope of inducing our universities and public schools to adopt some well-considered plan for giving geography its due place in the education of our youth; and as you have been told in our Report, we have with this view determined to appoint a Geographical Inspector, whose duty it will be to gather information as to the methods pursued on the Continent, to collect such books, atlases, diagrams, and appliances as have been found most effectual in imparting geographical knowledge, and to report to us fully on these subjects. Armed with this information, and having duly considered how such instruction may be best grafted into our insular system of education, we shall, I trust, be able with increased weight and irresistible force to appeal to the educational authorities of our country to supply this grievous deficiency in our national instruction.

From this interesting topic, which I feel persuaded you will not consider out of place in this address, I now turn to review the progress of geographical discovery during the past year.

Commencing with the Arctic regions, the subject of greatest interest is the expedition which has been equipped and despatched by the United States Government for the relief of the party under Lieutenant

Greely, now nearly three years absent and without communication with the outer world, at their remote station in Discovery Bay, Smith Sound. The failure of the attempt to reach them last summer, when the relief ship *Proteus* was crushed in the ice and wrecked, the crew escaping with difficulty to Cape York, rendered it manifest that, should no tidings of the party be received before the end of the season, a well-mounted expedition for their search and relief would have to be despatched in the present summer. At the commencement of the past winter, therefore, a board of officers, under the presidency of General Hazen, was appointed in Washington, to consider the question. Their work was done with exceeding thoroughness; all authorities at home or abroad likely to furnish useful information were consulted and their recommendations considered, with the result that an expedition in three ships has been organised, and is now on its way. As was to be expected, our own Government gladly availed themselves of the opportunity of being of service on such an occasion, the sympathy and active help rendered by the Americans in the case of the Franklin search rendering such co-operation a national duty. The *Alert*, of the Arctic Expedition of 1875-6, was presented to the United States, and Sir George Nares, with his brother officers Captain Markham and Major Feilden, co-operated in the most hearty fashion with the Washington Board, giving them the fruits of their experience and defining a plan of operations which, it appears, the board has decided to follow. Besides the *Alert*, the relief ships are the *Thetis*, a Dundee whaler, selected for the American Government by Mr. Leigh Smith, and the *Bear*, purchased in Newfoundland. The expedition has been placed under the command of Commander Schley, of the United States Navy. The advance ship, the *Bear*, sailed for Baffin's Bay on the 24th of April, the *Thetis* on the 1st of May, the *Alert* leaving New York on the 10th of May; the last-mentioned in steaming down the harbour flew the Union Jack, which was saluted by Fort Columbus at the harbour entrance with twenty-one guns, the British colours being replaced by the Stars and Stripes at the firing of the last gun. The three vessels are to meet at Upernavik in North Greenland.

In the well-considered memorandum of the three British officers which is printed in the interesting report of the Washington Board, it is gratifying to note that they do not take a despairing view of the chances of Lieut. Greely and his party, even if they have been obliged to pass a third winter at Discovery Bay, instead of moving last summer nearer to Greenland, living upon the numerous *caches* of provisions on their way. Such an expression of opinion coming from men so well acquainted with those inhospitable regions, encourages us to hope that ere long the welcome tidings may arrive of the rescue of the whole of the brave men, together with the fruits of their three years' observations, not only in the purely physical departments of science which were their special mission, but on the geography of regions lying so near the pole.

Turning now to the great Asiatic continent, the past year has brought us large and important additions to our knowledge. The ancient lands of Asia Minor have become anew the field of research, rendered necessary by the requirements, and directed by the more exact methods, of modern science. The admirable paper of Sir Charles Wilson read before us at one of our meetings in March, must be fresh in your recollection. In this *résumé* of the three and a half years' observations made by him over the greater part of the country, whilst fulfilling the duties of British Consul-General prescribed by the Treaty of Berlin, this distinguished officer and skilled geographer showed how great a harvest of fresh knowledge could be gleaned in a region in many respects so familiar to us. In physical and historical geography, in revised topography of sites and events renowned in the world's history, and especially in the present curious ethnography, affected to some degree by events which have happened in our own times, this paper forms a remarkable contribution to our knowledge. During some of his journeys Sir Charles was accompanied by Mr. Ramsay, who is now on an archæological mission in Asia Minor, but who has also made original observations on the changing ancient trade routes of the country. Mr. Ramsay is to continue his researches for another year, and I am happy to record that the Council of your Society have voted a grant of money in aid of his explorations. He will be joined at Smyrna in a few days by Mr. Arthur Smith, a young surveyor, whom we have also assisted with a grant of instruments, and from whom we may expect accurate topographical delineations of the districts explored.

In Central Asia, the summer of 1883 was remarkable for the activity and success of the Russian explorations in the Pamir, or the "Pamirs" as we might with greater accuracy term the region of elevated steppes and plains, of which there are several, near the summit of the broad and lofty belt of land which, lying nearly north and south, connects the Tian Shan with the Himalayas. The progress of Russian surveys in this region, from north to south and from west to east, has indeed been continuous and steady. Since the first explorations of the Alai and Trans-Alai in the north by Fedchenko some fourteen years ago, many able men, geologists and botanists as well as military topographers, have been engaged in extending our knowledge of the bekships or principalities on the western slopes and edges of the uplands; and last summer an important expedition was fitted out by order of the Governor-General of Russian Turkistan with the object of reaching the higher uninhabited Pamirs further east, where lie the sources of the Oxus, dominated by peaks supposed to be 25,000 or 26,000 feet in elevation. The expedition, consisting of Captain Putiata, M. Ivanoff (geologist), and M. Bendersky (topographer), and their escort, traversed and re-traversed these desolate regions in many directions, and connected the Russian surveys with those of the English officers, Trotter, Gordon, and Biddulph in their excursion across the Pamirs in 1874, during Sir Douglas Forsyth's

Yarkand expedition of 1873-4. At the same time the Russian botanist Dr. Regel was making his usual summer tour in the same region, a little further west. A preliminary map showing the united work of the Russians has been published in St. Petersburg, and extends considerably our knowledge of the upper tributaries of the Oxus and the configuration of the land. In some respects this map conflicts with the latest English map, issued by General Walker, Surveyor-General of India, with the survey report of 1881-2, in which the work of the pundit M—— S—— in 1878-81 was incorporated. This was the subject of a note from General Walker, read at our last evening meeting, in the discussion on Mr. Robert Michell's paper on the Upper Oxus. General Walker concedes the error of the pundit on one point, namely, the separation of the Aksu as a separate stream from the Murghab; but maintains his accuracy with regard to another—where he represents the Oxus as flowing with only slight bends between Murghab and Vandj, in the section where Dr. Regel represents an enormous bend or loop. These discrepancies may serve to show how far from complete is our knowledge of this difficult region, so interesting as lying near the still undefined boundaries of the Russian and British Indian Empires.

A little further south, across the Hindu Kush, a remarkable journey was made last year by an English surveyor, Mr. McNair, whom we had the pleasure of listening to at one of our meetings before last Christmas. Mr. McNair, as you will remember, during his leave of absence from his duties, penetrated in disguise through the Swat and Chitral valleys, and, first of any known European, succeeded in entering Kafiristan, whence he brought us valuable additions to our knowledge of the habits of the interesting primitive tribes who inhabit these rugged elevated valleys. Mr. McNair's return journey from Chitral was also remarkable, being to the northward via the Tui Pass and Gilgit to Kashmir.

In India much fresh geographical information has been acquired, chiefly through the agency of members of the Survey Department. An explorer of the Trigonometrical Branch has added 2000 square miles to our topographical knowledge of Dardistan, working from the high watersheds about Chilàs at elevations of 15,000 feet and upwards.

The remarkable journey through Tibet and Mongolia of A—— K——, another native explorer, which occupied him four years, has already been shortly reviewed in the pages of the Society's Journal; but now that his notes and observations have been compiled, it claims further notice for the value of the results obtained.

His work connects with that of Prejevalsky, the intrepid Russian traveller; it identifies places mentioned by Marco Polo; it checks the value of points laid down by the Jesuit Fathers in 1711; it falls in with Gill's route from Darchendo to south of Batang; and after finally clearing up the disputed identity of the Sanpo and Brahmputra, this long circuit is closed with an error of about a mile and a half either way in

latitude and longitude. Nor have the surveyors of the Frontier Survey party under Major Holdich been idle. Mr. McNair's adventurous journey into Kafiristan has already been alluded to. Not the least valuable result of his work is this. He has been the first to show the way to British geographers in making scientific maps of a new sort, not trusting to the uncertainties of compass readings, of field-book entries, and inaccurate protracting, but working on the same admirable system which has been adopted for the topographical surveys of India; and he has thus turned out a series of geographical maps which may safely be pronounced unequalled by anything hitherto accomplished under similar conditions.

Another assistant, disguised as a native *shikari* or huntsman, penetrated into the unmapped and dangerous region of the Affridi Tirah, and gained much valuable information about this most important district of the trans-frontier. Blanks in the maps of the Jowaki Hills on the Affridi border have been filled up by a native surveyor who showed great determination in face of great risk and subsequently made an admirable survey of that important frontier pass called the Gomul. There is not a pass now between Peshawar and the northern border of Sind that has not been traced out through the rugged defiles of the border hills on to the Afghan uplands.

McNair's surveys of the many passes leading from Bannu into Afghanistan; the Syad's survey of undoubtedly the best highway which exists between the frontier and Ghazni, via the Dawar valley and over the Jadràn watershed; the Hakim's survey of the hitherto utterly unknown districts of Shawàl and Birmal, west of Waziristàn and bordering the Gomul; the Bòzdar's map of the Vihowa basin carried far to the west of the Suliman Hills; the reconnaissance of Colonel Lance and Mr. Fryer through another great route to the Afghan highlands, not far south of the Vihowa, all deserve a passing notice, for they are mostly surveys, not mere explorations, and they all bear directly on the great question of our communications with Kandahar and Kabul.

In December last, Major Holdich, accompanied by Mr. Thorburn, the local political officer, and supported by a military force, for the first time in history placed his theodolite on the highest peak of the great Takht-i-Suliman mountain, the dominant peak of the Suliman range; all the country between that mountain and the border was mapped, fresh passes explored, and trigonometrical observations taken to points scattered over the great Central Afghan plateau, which will furnish that basis of accuracy without which maps can only claim to represent reconnaissance—not survey. Never before had any European invaded the sanctity of that "Throne of Soliman," and it is somewhat remarkable that the two most defiant strongholds of ignorance on the Indian border—Kafiristan and the Takht-i-Suliman—should have succumbed to geographical enterprise in the same year.

About the same time Sir Robert Sandeman started on a political mission through south-west Baluchistan to Gwadur, on the shores of the Persian Gulf. The Hon. M. G. Talbot, R.E., of the Frontier Survey, accompanied him but did not return to India via Gwadur. After connecting previously indefinite route-surveys by means of a connected series of triangulation from Indian bases, Lient. Talbot turned north from Panjgur and with the assistance of Lient. Wahab, R.E., applied himself to the topography of a vast and mostly desert region adjoining the Persian frontier. He has only just returned to India, but the result of that seven months' tour over those alternately scorching and freezing highlands is an enormous outturn of topography, covering many thousands of square miles, the final adjustment of much doubtful geography, and the determination by triangulation of many points in Persia which will connect St. John's surveys with Indian bases. On other points of the long-extended frontier of India geographers have been busy. Colonel Tanner in Sikkim and Colonel Woodthorpe with the Abor expedition have both been steadily at work, but details of what these two well-known geographers have lately accomplished are at present wanting.

Before quitting the subject of India, I must not omit to note the important treatise and map of Colonel Godwin-Austen, published in our 'Proceedings,' in which this experienced geologist and surveyor has developed his views on the relation of geological to topographical delineation of the chains of the Himalayas. The ascents of mountain peaks in the Kumaon and Sikkim range, by the Alpine climber Mr. W. Graham, I refer to in another place.

In other parts of Asia we have to note the progress of Colonel Prejevalsky on his third great expedition to Mongolia and Northern Tibet. He started from Kiakhta in Eastern Siberia early in the autumn, crossed the Gobi Desert, and was at Alashan on the 20th of January. His intention is stated to be to explore the whole region, east to west, from the sources of the Hoang-ho to the Pamir. In the Turkoman Desert we are again indebted to Russian explorations for additions to our geographical knowledge. Gladyshev has fixed the position of Merv, both in latitude and longitude, by astronomical observations, and Lessar has traversed the desert south of Khiva, reporting the non-existence of the ancient bed of the Oxus, supposed to exist in that direction.

In Australasia, the region which has attracted, and doubtless will continue to attract the most attention, is the island of New Guinea. In the remarks which it was part of my duty to address to you on the opening of the present session, last November, I gave a brief account of recent explorations in this huge and almost unknown island, describing the difficulties which the rugged nature of its surface and the uncertain temper of the aborigines offer to journeys by land into the interior. I need not here repeat those observations, but may remark that later news of travellers tends to confirm them. Several attempts made last summer

to cross the island from Port Moresby, at not a very wide part, viz. less than 100 miles, have in fact failed, owing partly to natural obstacles, partly to the hostility of the natives. The expedition of Captain Armit, equipped by the Melbourne *Argus*, appears to have been unable to reach the base of the Owen Stanley range, but to have been diverted from the direct inland course and to have travelled parallel to the coast. He is now stated to have penetrated, during about two months' travelling, not further than 22 miles in a direct line from the sea. Another expedition despatched by the Melbourne *Age* under Mr. Morrison, took a more direct inland course, but was driven back, and its leader wounded in a hostile encounter with the natives, whilst crossing a spur or foot-hill of the Owen Stanley Mountains, at a distance of 35 miles from Port Moresby. The furthest point yet reached by land in this direction, or in any part of the island, is 40 miles, a distance attained by the Rev. Mr. Chalmers, who has, by the way, again this year opened up a new district in the island, discovering the delta of a large river, peopled by a tribe of cannibals 140 miles north-west of Port Moresby.

The history of the discovery and exploration of New Guinea was the subject of a paper from the graphic pen of our Secretary Mr. Markham, read at one of our evening meetings this session. This will be published with a bibliographical supplement, containing references to all published works and memoirs relating to the island, in the next part of the 'Supplementary Papers' of the Society. The supplement is compiled by Mr. Markham and Mr. Rye, our Librarian. Meantime an excellent and useful summary of our present knowledge of New Guinea, by Mr. Coutts Trotter, has been published in our monthly 'Proceedings.'

The Committee, which I informed you last November had been appointed by the British Association for promoting the exploration of New Guinea, met during the winter, and in co-operation with your Council recommended, as well calculated to attain the objects in view, an expedition which was being prepared by Mr. Wilfred Powell. This expedition has since been abandoned owing to sufficient funds not being forthcoming. Your Council have since decided to offer their encouragement to another expedition on a smaller scale, which Mr. H. O. Forbes, the explorer of Timor and Timor Laut, is now preparing. Mr. Forbes intends to make a determined effort to reach the summit of the Owen Stanley range, not by the direct route from Port Moresby, which has been proved so difficult, but by a new route further to the north-west. We have voted a contribution of 250*l.* towards the cost of this expedition, which, if successful, will give us some definite and much needed information regarding the highlands of the interior and their natural products.

In the great island-continent of Australia, the chief explorations of the interior during the past year have been those of our medallist,

Mr. John Forrest, in the Kimberley District of the North-West; Mr. D. Lindsay in Arnheim Land, west of the Gulf of Carpentaria, during which a new river, the Walker, was traced up for 40 miles; and Mr. Carr-Boyd in the almost unknown border-land between the northern territories of South and West Australia. The official report of Mr. Forrest furnishes a vast amount of information regarding the topography, condition, and capabilities of the newly opened region to which it refers, and supplements the work of his brother, Mr. Alexander Forrest, who first explored the same district in 1879.

Turning to another island of Australasia, we may record the Rev. W. S. Green's expedition to the greatest glacier of the New Zealand Alps and his ascent of their highest summit, Mount Cook, now definitely ascertained to rise to an elevation of 12,300 feet above the sea. The short time at Mr. Green's disposal unfortunately prevented him from doing full justice to the subject. But he has, we may hope, shown the way to future alpine travellers, who will complete the labour carried on for so many years by Dr. von Haast, and give us a thorough knowledge of the interesting physical features of the western flanks of the chain, its deep glaciers, closed fiords, and towering summits, and enable us to compare its characteristics with those of other snow-clad ranges, the materials for which are still imperfect.

Mr. Green had the assistance in his glacier explorations of two Swiss, natives of Grindelwald, who have since been engaged with a young Englishman, Mr. W. Graham, in transferring to the Himalaya that hardly waged contest between men and mountains which has in Europe been brought to a victorious conclusion. What success they met with in their glacier explorations in the Kumaon and Sikkim ranges, under the shadow of Nanda Devi and Kinchinjanga, you will next month have an opportunity of hearing.

In the great continent of Africa the work of exploration is being carried on with unabated vigour, and the year has seen the accomplishment of many interesting journeys through new tracts. At the same time new geographical problems have been started, showing how far the field is from being exhausted. The area of the unknown is however steadily diminishing, under the attacks of travellers of various European nationalities, some of them with scanty means but an abundance of scientific enthusiasm, others supported by powerful associations but with objects not purely geographical. Thus, commencing with the eastern side of the tropical part of the continent, to which the first half of Ravenstein's large map recently published by our Society relates, the wide tract between the east coast and the Central Lakes south of the Equator has recently been traversed in many new directions, and may be said to be now fairly well known. Last year that accomplished traveller, Mr. O'Neill, succeeded in crossing from Mozambique to Lake Shirwa or Kilwa, making a running survey of his route

there and back, defining for the first time the outline of the lake, and discovering two other lakes to the north, from one of which the river Lujenda takes its rise. Mr. O'Neill is one of our most enterprising and accomplished African travellers. To the necessary qualities of courage and endurance, and to the faculty of observation, he adds the knowledge of a skilled surveyor and excellent linguist. During the five years that he has occupied the post of British Consul at Mozambique, he has undertaken at least eight journeys of exploration of various extent. He began in 1880 by visiting and surveying parts of the Mozambique coast which were very imperfectly known, and ascertained the existence of several excellent harbours, one of which was first discovered by him. His first considerable journey into the interior was executed in 1881, when he penetrated nearly 300 miles in the direction of Lake Nyassa. The desire of solving some interesting geographical problems, such as the true sources of the Lujenda—whether in Lake Shirwa or some other independent lake—together with the reported existence of snow-capped mountains, inspired his last and latest journey, which was the subject of a paper read before our Society on the 28th April. During this journey, great additions were made to our knowledge of very interesting regions and peoples; and the extracts from his journals read on that occasion, written in clear, animated, and graphic language, give us reason to expect from his pen a narrative of no ordinary interest and value. The Rev. W. P. Johnson has also opened up new tracts in the same region a little nearer Lake Nyassa, including a route not previously known between Lake Shirwa and Quillimane; whilst Mr. James Stewart, before his lamented death last summer, completed the survey of the eastern coast of Lake Nyassa. The sections of a steamer destined to navigate Lake Tanganyika, are reported as having been delivered to Captain Hore, of the London Missionary Society, at the south end of that lake, by way of the new road overland from Nyassa, and Mr. Johnson hopes soon to return to Africa with a new steamer for the last-named great stretch of inland water. Further north the smaller Lake Rikwa, named Lake Leopold by Mr. Joseph Thomson, the only European who had seen it, has been revisited by Dr. Kaiser, of the German African Society's Expedition, who unhappily died of fatigue on its shores, and was buried there by his negro attendants, in October 1882. His diary and route-map have been recovered and recently published by the Society in Berlin, and the latter shows a narrow sheet of water deeply sunk between lofty mountains, as described by Thomson. Beyond this again, portions of the southern Masai country have been recently visited and described by Mr. Last and Dr. Baxter.

The chief blank that remains on our maps of this side of the continent is that which lies north of Mombasa and Kilimanjaro. This, as you are aware, was the ground chosen by our Society's expedition now on foot under Mr. Thomson. With regard to this I have little to record in

addition to what I said at the opening of the session. Mr. Thomson's last communication before entering the unknown interior was dated July 10th, and he has since been reported by a passing caravan to have been seen at Lake Naivash about the 1st of August; but subsequent to that, not even a rumour concerning him has reached Zanzibar. Sir John Kirk, however, believes the absence of news a favourable sign, and he has given directions to the authorities on the coast to report without delay any information that may reach them. Another expedition of great general and scientific interest has left England in the present year for the more thorough exploration of the snow-capped Mount Kilimanjaro, especially with regard to its botanical and zoological productions. Its leader is Mr. H. H. Johnston, who is so favourably known to us for the graphic account he gave at one of our meetings last autumn of his ascent of the Congo. The expedition is supported by grants from the British Association and the Royal Society, and may be expected to yield valuable results.

The interesting Galla and Somali countries, which lie between Thomson's route and the Gulf of Aden and Abyssinia, still prove almost inaccessible to Europeans. M. Revoil, the enterprising French traveller who was successful in a former journey in Northern Somali-land, has been foiled by the hostility of the natives in his recent attempt to penetrate the interior from Magadoxo. In northern Shoa and southern Abyssinia excellent geographical work has been accomplished by Dr. Stecker (the former companion of Gerhard Rohlfs), who has explored the river Didessa, or Upper Juba, and the previously unknown Lake Miete, in the country of the Arusi Gallas. The region, I may remind you, was the subject of an excellent paper read at one of our recent meetings by Mr. Ravenstein, in which he reviewed the information collected from natives regarding the interior by the Rev. Thomas Wakefield and others. It is in the north-western part of this region that the gallant band of Italian explorers—Antinori, Cecchi, and Chiarini—have so eminently distinguished themselves. The most recent Italian exploit in this region has been the adventurous journey of Count Pietro Antonelli to open up a new and direct route between the Italian seaport Assab and the station founded by Marquis Antinori in Shoa.

On Victoria Nyanza, Mr. Mackay and his fellow-labourers of the Church Missionary Society have just completed the construction of a sailing vessel, sent to them in sections from England, by means of which the remoter parts of that great interior water will no doubt soon be visited. Further towards the centre of the continent, we have lately heard of the efforts of Lupton Bey in the Niam-Niam region to extend the bounds of our knowledge, and of the interesting problem of the course of the great river Wellé or Kuta, which has been discussed between him and the Russian traveller in the same region, Dr. Junker. The latitudes given by Lupton Bey, and the direction

taken by the Wellé seem to forbid the supposition that it is the same river as the Aruwimi, the great northern tributary of the Congo, and Dr. Junker is of opinion that it is the same stream as the Shary, which flows into Lake Chad. Mr. Stanley appears to adhere to the view that the Aruwimi is the Wellé, and he has recently ascended it with small steamers from the Congo. On the other hand, the suggestion has been made by a correspondent in our 'Proceedings' that the Wellé is a tributary neither of Lake Chad nor the Congo, but flows by the rumoured Lake Liba, through the unexplored region between the Ogowé and the Shary and disembogues at Old Calabar. This interesting problem is likely to be solved, either by Dr. Junker, who is still at work in those remote regions, or by Mr. Flegel the Niger explorer, who after tracing the sources of the Benué tributary of that great river, has been commissioned by the German African Society, and supported by a grant of 40,000 marks, to cross the great blank region lying between the Benué and the middle course of the Congo. Mr. Flegel has already started on this adventurous expedition.

Regarding the Congo, if we separate, as we must, the geographical from the somewhat complicated political interests in a region which has become a scene of so much varied activity, there is not much progress to record during the past few months. M. de Brazza appears to have been engaged chiefly in establishing stations and securing his communications between the Ogowé and the navigable part of the Congo. We hear of him as organising five stations, at intervals between the mouth of the Ogowé near Cape Lopez and Franceville, on the upper river, and of his companion Dr. Ballay, as having crossed the watershed, and launched the first steamer on the Alima tributary of the Congo on the 23rd of July last. But a distinct addition has been made to our geographical knowledge by Lieutenant Mizon, an officer who having completed his term of service with the De Brazza expedition, undertook, on his way to Europe, an interesting piece of exploration on his own account: instead of descending the Ogowé, he struck across the unexplored country to the west and reached the Atlantic at the port of Mayumba. The result of this meritorious journey, through the heart of the gorilla country, will be to define for the first time the basins of the Ogowé (on the south) and the Kuilu rivers.

Since Mr. Johnston's visit to Stanley's stations on the Congo last spring, our two Associates, Sir Frederic Goldsmid and Mr. Delmar Morgan, have been on a mission to the same region, Mr. Morgan ascending as far as Stanley Pool, and both have given us an account of their voyage. A description, with a map, of a boating tour round Stanley Pool has in the meantime been sent to us by our valued correspondent the Rev. Mr. Comber. Much further information regarding the Lower Congo, its resources, trade-routes, and prospects, may be expected from Mr. Comber's colleague, the Rev. Mr. Bentley, who

has just returned to England after a five years' residence on the river.

At the far head-waters of this wonderful river a French traveller, M. Giraud, has been making a bold attempt to descend the stream, supposed to be the Upper Congo, which flows out of Lake Bangweolo, for ever memorable as the scene of Livingstone's heroic death. M. Giraud left the coast near Zanzibar with a strong party of natives on the 10th of December, 1882, and passing between Lakes Nyassa and Tanganyika in May or June last, arrived at Bangweolo in July. He here launched a little boat which had been carried from the coast, and embarking with eight of his men (sending the rest of his caravan by land to Cazembe's town), descended the effluent river, the Luapula, for many days until he reached an impassable cataract, where, beset by a large party of hostile natives, he was made prisoner and robbed of boat and goods. Rejoining his caravan at Cazembe, he was soon plundered of the remainder of his stores and escaped, at the risk of perishing by hunger, to the Belgian station on Lake Tanganyika. From this place he reports his intention, after renewing his supplies, of persevering in his journey down the whole length of the Congo. If finally successful, this will be one of the boldest, and geographically the most interesting, of all recent journeys across the African continent.

Before I conclude this brief and very imperfect review of the geographical events of the year, I must make one brief reference to South America—that large and interesting continent of which we hear less in the way of geographical exploration than of any other. It is in relation not to accomplished work but to a projected expedition, viz. one to explore the wonderful mountain Roraima in British Guiana, a table-topped mass with precipitous sides rising sheer 1500 feet above the slopes of its talus, and hitherto deemed inaccessible, except by balloon. The well-known scientific traveller in British Guiana, Mr. Im Thurn, now resident there, has offered to lead a small exploring party to the mountain, to make a careful study of its geological formation, of the botany, zoology, and topography of the vicinity, and to endeavour to reach its summit. Your Council, on the recommendation of Sir Joseph Hooker, have made a grant of 200*l.* towards the expenses of the expedition, and we may expect soon to hear of this most interesting enterprise being carried out.

The Hydrographer of the Admiralty (Sir Frederick Evans) has furnished me with the following brief summary of the marine surveys executed under the directions of the Lords Commissioners of the Admiralty during the year 1883. A report—in full detail—of this useful work to the nation, as well as that accomplished by the Hydrographic Department in the same time, has, in accordance with late custom, been prepared for the House of Commons, and will appear in our 'Proceedings' hereafter.

The steady examination of the shores of the United Kingdom to meet the requirements of modern navigation, is still maintained. Two vessels are engaged on this service. These, and the foreign surveys in progress, require 57 officers, and 468 men, with four sloops of war, and five smaller vessels. The foreign surveys include the China Sea, Korea, Borneo, islands in the Western Pacific Ocean, the North-west Coast of Australia; and on the continent of America, Newfoundland, the Bahamas, the mouth of Rio de la Plata, and Magellan Strait.

The chief results of these operations have been:—in Korea, the charting of the approaches to the new treaty port of Ginchuen (near the capital city Seoul), embracing the vast labyrinth of islands extending from Sir James Hall Group to the Clifford Islands. The completion in Borneo of the north-east coast, extending south to Sibutu Passage, with the several off-lying shoals. The examination of Sunda Strait, which was visited shortly after the eruption of August 1883, when the configuration of Krakatoa and the neighbourhood was defined, and several excellent illustrative views of their existing features obtained.

Extensive additions have also been made to our knowledge of the Hydrography of the Solomon Islands, as also of the New Hebrides in the Pacific Ocean; and on the north-west coast of Australia, to the coast line and approaches between the 16th and 22nd parallels of south latitude. The south coast of Newfoundland is being steadily surveyed in detail, as is also the Little Bahama Bank, among our island possessions in the West Indies.

The useful survey of the seaward approach to the spacious estuary of the Rio de la Plata, a work of much labour in the interests of navigation, has been completed by the officer (Captain Wharton), nominated as the successor to Sir Frederick Evans in office at the Admiralty. This able and zealous officer has also added materially in the past year to the hydrography of Magellan Strait, the charting of which great highway may now be considered sufficient for the present wants of navigation.

The Submarine Cable Telegraph Companies continue to contribute largely to our knowledge of the depth of the ocean—a valuable feature in modern hydrography.

In closing this review of a twelvemonth's work, it may be interesting to summarise the additions actually made to our knowledge, or those which may fairly be expected from the expeditions undertaken during that period.

Our knowledge of the Arctic Regions cannot be said to have been extended. Something may, however, be done by the American Relief Expedition, especially if they succeed in discovering the missing party.

In Central Asia and the N.-W. Himalayan regions, the discoveries of Captain Patiata and his Russian colleagues, those of Mr. McNair, and the British officers engaged in the Frontier Survey, have introduced to us districts and peoples hitherto unvisited by Europeans; Prejevalsky

and other Russian explorers are penetrating by new paths into Mongolia and Northern Tibet, or exploring the Turkoman Desert; while Mr. Graham has scaled Himalayan peaks hitherto untrdden, and reached heights loftier than any attained by human foot.

New Guinea and the surrounding islands are attracting much eager attention; something has been added to our existing knowledge, and much more may soon be expected.

Australia is still the scene of active exploration by travellers of approved enterprise and skill.

Africa remains what our Secretary, Mr. Markham, described it in 1880, "a glorious field of generous rivalry among civilised Europeans," and, it may be added, a field fertile in its geographical yield. English, Germans, French, Italians, and Portuguese are busily engaged in penetrating the deepest recesses of the "Dark Continent," and information of the highest value may be expected from the daring and extensive expeditions of Thomson, Flegel, and Stanley into vast regions hitherto unexplored; while in the Somala and Galla countries, in Shoa and Abyssinia, travellers of many nationalities are mainly engaged in the necessary task of rediscovering regions visited centuries ago by French, Spanish and Portuguese missionaries, and inhabited by tribes among the most hostile and dangerous to Europeans.

No very material additions have been made to discovery in South America since the invaluable explorations of the Andes described to us by Mr. Whymper in 1882; and, so far as we are informed, the only projected expedition is that of Mr. Im Thurn to Roraima in British Guiana.

You will, I think, agree with me that there has been no falling off in the supply of energetic and accomplished travellers, and that vast regions still exist to excite their ardour and reward their enterprise. When we next meet to review the events of the year upon which we are entering, may your President be able to record the rescue of gallant explorers, and to chronicle fresh triumphs of geographical enterprise, undimmed by the loss of any of those brave and generous men who, carrying their lives in their hands, imperil them in one of the noblest of all causes, the extension of human knowledge and civilisation.

OBITUARY FOR THE YEAR 1883-4.

Our losses by death during the year, from the end of April 1883, to the corresponding date of 1884, have been very large, no fewer than seventy-five of our Fellows having passed away during that period. Biographical notices of some of them, who had distinguished themselves as travellers, or for their services to geography, have already been published in the monthly 'Proceedings'; these are:—Admiral Sir RICHARD COLLINSON; Mr. V. EGERTON HARCOURT; Rev. Dr. ROBERT MOFFAT; Mr. WILLIAM SPOTTISWOODE, President of the Royal Society; Lieut.-General Sir EDWARD SABINE, B.A.; the Right Hon. CHARLES EARL SOMERS; Mr.

JAMES STEWART, C.E., and Mr. JAMES YOUNG of Kelly. Among the remainder were many who were eminent in other ways, though not known especially as geographers: their names are as follows, in alphabetical order:—

Mr. F. T. P. BARLOW; Mr. H. HULSE BERENS, of Sidcup, many years a Director of the Bank of England, a member of our Society since 1859, who died in August last; Admiral C. R. DRINKWATER BETHUNE, C.B., who was born in 1802, entered the navy at an early age and became captain in 1830, rear-admiral in 1855, and admiral in 1866. He served with distinction in the Chinese war of 1841, and took part in the capture of Canton. The Duke of BUCCLEUCH, K.G., F.R.S., who was elected a Fellow of our Society in 1867, the year in which he served as President of the British Association for the Advancement of Science; Captain the Hon. JOHN CARNEGIE, B.N., who took part in 1846-7 in the New Zealand war, and in the Crimean war, as lieutenant on board the *Sidon*, was present at the bombardment of Kertch, Kinburn, &c., and at the fall of Sebastopol; Mr. R. G. CLEMENTS; Major W. B. COLVIN, of the Royal Fusiliers; General Sir ARTHUR T. CUNYNGHAME, G.C.B., the author of 'Travels in the Eastern Caucasus, &c., in the Summer of 1871,' an officer who had seen much service during his long military career in various parts of the world; he was aide-de-camp to General Lord Saltoun in the China war of 1841 and led the column of attack at the storming of Chin-Kiang-fu. In the Crimean war he was present at nearly all the engagements up to May 1855, and in October of the same year led the force of 10,000 which took Kertch; subsequently he served in India and commanded at Lahore in 1865 the reserve forces of the army employed in the Sittana campaign, and in 1877-78 was Lieutenant-Governor at the Cape of Good Hope; Mr. G. D. W. DREBY; Mr. J. H. DIXON; Mr. E. B. EASTWICK, C.B., F.R.S., the eminent Orientalist, who died at Ventnor on the 16th of July, at the age of 70. Whilst in the East India Company's service in early life he distinguished himself by the rapidity and completeness with which he learnt the various Eastern languages, and, after returning to Europe, was appointed, in 1845, professor of Hindustani at Haileybury. In 1859 he was appointed to the Political Department in the India Office and in 1860 went out as Secretary of Legation to Persia. In 1866 he acted as private secretary to Lord Cranborne (now Lord Salisbury), Secretary of State for India. He sat in the House of Commons as member for Penryn and Falmouth from 1868 to 1874. He was the author of numerous works on Oriental subjects, besides a book of travel in Venezuela, to which country he made two visits on financial missions. He was elected Fellow of the Royal Society in 1851 and of our Society in 1869; Mr. G. M. M. ESMEADE; Rev. J. G. CURRY FUSSELL; Mr. W. HENRY FLETCHER; Mr. THOMAS FRAZER; Mr. ARCHIBALD GRAY; Professor A. H. GUYOT, LL.D., the distinguished geographical writer, of Swiss nationality, who settled in the United States in 1848, and was professor of physical geography in the college of New Jersey at Princeton from 1855 to his death last winter. Before he went to America he gained considerable reputation by his investigations of glacial phenomena and the distribution of erratic boulders in Switzerland, and he was professor of history and physical geography at Neuchâtel from 1839 to 1848. He is known chiefly for his admirable text-books of geography in which the principles of Carl Ritter are applied to the physical as well as the historical branch of the science: these were his 'Primary Geography,' published in 1866; his 'Intermediate Geography,' in 1870, and his 'Physical Geography,' with a set of wall maps, in 1873; Mr. JOSEPH GLEN; Mr. JOHN JAMES GALLOWAY; Major ANDREW GAMMELL; Mr. JOHN LEWIS GEIGER, the author of the lively 'Peep at Mexico: narrative of a journey across the Republic from the Pacific to the Gulf in December 1873 and January 1874' (London, 1874); Mr. RUSSELL KING HALL; Colonel ROBT. WM.

HAMILTON; Admiral GEORGE S. HAND, C.B.; W. EGERTON HUBBARD; Staff-Commander JOHN JONES, R.N.; General the Right Hon. Sir W. T. KNOLLYS, K.C.B., Gentleman Usher of the Black Rod, who died on the 23rd of June last; Mr. SIMON KERR; Dr. W. KANE; LINANT PASHA, or M. LINANT DE BELLEFONDS, the well-known Egyptian engineer, who was leader of the surveys and explorations undertaken by a body of French engineers in 1845 for piercing the isthmus of Suez, and the author of various important maps of Egypt including the great hydrographical map of the country in three sections. He travelled extensively in Egypt and the Egyptian Soudan, and in Abyssinia and Palestine, and died at Cairo at the advanced age of 83. He was elected Honorary Corresponding Member of our Society in 1863. Mr. ALFRED G. LOCK; Lieut. HASTINGS ROWLEY LEES, R.N.; Mr. JOHN LEE; Mr. JOHN LAMPREY; the Right Hon. Sir JOHN McNEILL, G.C.B., who spent much of his early life in Persia, where he was for some time British Ambassador, and died on the 17th of May last, in his 88th year; Mr. J. E. McCONNELL; Mr. NEVILLE F. MACKAY; Mr. J. LESLIE MAIN; Rear-Admiral DAVID MILLER; Mr. JOSEPH MILLIGAN; Mr. W. NAPIER; Mr. G. W. NICOL; Lord OVERSTONE, M.A., the great authority on monetary and financial subjects and author of various important publications on fiscal questions; Mr. W. H. PAULSON, B.A.; Mr. GEORGE PEACOCK; Mr. J. NISBET ROBERTSON; Mr. T. H. RUMBOLD; Mr. H. BIRCH REYNARDSON; Dr. THOS. SOMERVILLE; Mr. MILES STAVELEY; Sir A. D. B. SCOTT, F.L.S.; Mr. J. R. SHAW; Mr. H. A. SEVERN; Sir W. TAYLOR THOMSON, K.C.M.G., who was Chargé d'Affaires in Chili from 1858 to 1872 and for seven years afterwards Envoy Extraordinary and Minister Plenipotentiary in Persia; Mr. T. TURNER; Mr. J. BANKS TAYLOR; Mr. JOHN A. TINNÉ, the brother of the celebrated lady traveller in Africa, Miss Alexandrine Tinné, who took great interest in African geography and published in 1864 'Geographical Notes of Expeditions in Central Africa by Three Dutch Ladies' (Liverpool, 1864), and a few years afterwards the 'Plantæ Tinneanæ,' a folio work, in which some of the plants discovered by Miss Tinné, chiefly in the Bahr Ghazal region, were described by Kotschy and Peyritsch; Capt. J. TOWNSHEND, R.N.; Rev. T. COOKE THORNTON, M.A.; Lieut.-General JAMES TRAVERS, V.C., the distinguished Indian officer, who had served through the Afghanistan campaign of 1840-42, the Sutlej campaign of 1846, and the Indian Mutiny; Mr. JOHN WESTWOOD; Mr. C. A. WINCHESTER, formerly of the Consular service in China, who frequently took part in the discussions regarding Chinese geography at our evening meetings; General Sir W. FENWICK WILLIAMS, Bart., G.C.B., D.C.L., the hero of Kars, who died in July last, in his 83rd year; Mr. S. KING WILSON; Major W. J. WILLIAMSON, Bengal Staff Corps; Colonel F. G. WHITEHEAD; Mr. THOMAS WATSON; Mr. W. O. WHITE.

Travels in North-Western Arabia and Nejd.

By CHARLES M. DOUGHTY.

(Abstract of a Paper read at the Evening Meeting, November 26th, 1883.)

Map, p. 428.

I.—DAMASCUS TO MEDYIN SALIH.

MR. DOUGHTY'S travels in Arabia began in the winter of 1876, and lasted till the autumn of 1878. In previous years he had wandered widely over Palestine, Sinai, and the lands beyond the Jordan, and the idea of extending his travels farther into Arabia was suggested to him on the occasion of a visit to Petra. The remains still visible at the place are believed by Mr. Doughty to be those of a few hewn public halls or temples, together with sepulchres, not dwelling-houses, cut out in the rocks. The city itself he believes to have been built of clay, and hence to have been washed away. While viewing these remains Mr. Doughty was asked by the villagers, who had seen him arrive from the south, whether he had not seen the similar monuments at Medyin Salih, which is ten journeys distant by the Haj or pilgrimage road from Maan, a station a little to the east of Petra. Subsequent inquiries not only confirmed the information of the villagers that the monuments of Medyin Salih were similar to those of Petra, but also enabled him to learn that some of the former monuments bore inscriptions in strange characters very often accompanied by the figure of a bird with wings expanded.

Mr. Doughty would have set out for Medyin Salih immediately on learning this, but was thwarted by the pasha, who was afraid lest any misadventure should happen to a European travelling in the wild Beduin country. The lieutenant, however, told him that if he must needs go to Medyin, he might go with the pilgrimage.

This was in the spring of 1875, and the rest of that year and the greater part of the next were spent by Mr. Doughty in riding through Edom, Moab, Ammon, and the Hauran, to Damascus,* and in making various efforts to enter Arabia with the view of reaching Medyin Salih from that centre.

At Damascus the advice to accompany the pilgrimage to Medyin Salih was repeated to him by some Mahommedan friends in the autumn of 1876, and Mr. Doughty then resolved to act on this suggestion. He disguised himself as an Arab, bought a sack of Haj biscuits, and procured a camel for the journey. Before he was ready the pilgrims had already departed from Damascus, but they lay encamped in the desert at

* For information regarding the towers of Shebib ibn Tubbai, Lejûn, Dâtras, Mehaj, Medabia, Burma, Jardinieh, and the topography of these marches, Mr. Doughty refers to his article in Dr. Kiepert's 'Globus,' vol. xxxix. p. 8.

Muzzarib, at the distance of two camel ourneyes, awaiting the signal to set out. There Mr. Doughty joined them the day before the final departure. The number belonging to this caravan, according to their own computation (seldom very trustworthy, says Mr. Doughty) was about 6000 souls, together with 10,000 beasts of burden, chiefly camels, but also dromedaries, mules, and horses. The caravan guard numbered about 800 soldiers: about 100 *Azeyl* or dromedary riders, natives of Nejd, clad and armed as the Beduins and well fitted to deal with the nomads, who march in the rear of the caravan; while on the flanks and in the van were nearly 200 horse-soldiers, *Sayal*, with two field-pieces and their carriages carried upon mules.

The whole march was conducted without confusion. The length of the caravan, marching with some four camels abreast, was nearly two miles. The servants of the Haj are every year upon the road, and by them each man has his place assigned to him. The encampments are always made exactly alike, every tent being set up in the same position at each halting-place. The tents are pitched by a party which rides half-an-hour in advance of the main body of the caravan, and has the canvas city already erected by the time the latter arrives. Every *mensil* is circular in shape. The small tents of the Haj soldiery are pitched at distances of 60 paces, and in each of them there are accommodated as many men as are necessary to keep the night-watches. But the safety of the caravan is rather due to the *sunz* or road-toll paid to the roadside Beduins—a black-mail which may amount to as much as 25*l*. per mile.

In ten marches the caravan arrived at the village of Maan, where the pasha who had previously given Mr. Doughty the hint to join the Haj tried to find him out, probably with the intention of stopping him, but failed to find him, disguised as he was in the Arab costume. In the second march from Maan the caravan came to Akaba on the confines of Arabia Deserta, where, according to the early Mahommedan geographers, the true Arab country begins.

Up to this point the marches had been comparatively easy, but henceforward they were carried on day and night, trying the endurance of men and beasts to the utmost. The whole aim of the caravan is to reach water, since loaded and sweating camels, even in the winter season, cannot hold out above three days without drinking. To provide this necessary, *kellas* or fortified water stations, have been constructed at a remote period at every journey's end, or every second or third journey's end, on the Haj road. A *kella* is a tower built upon a well, and kept by a small garrison. The water, commonly drawn by a very laborious process, is poured into a *birket* or cistern made outside the walls. Throughout the route the water is very foul and unwholesome, which is accounted by the Haj pilgrims their second great suffering—a suffering all the more keenly felt since the Syrians, dwelling in a

limestone country, are accustomed to sweet spring water. These filthy waters are doubtless the cause of some grave diseases of the bladder and intestines.

In the last march before reaching Tebúk the caravan was on the route for 24 hours out of 26. It is amazing to see how the Haj servants, camel-drivers, carriers, tent-pitchers, and the like, making up about half the caravan, all of whom travel on foot, are able to endure such long journeys. That day they must have walked more than 60 miles, and during the whole pilgrimage from Aleppo and Damascus to Mecca and Jebel Mâsa they must march some 2000 miles in four months.

Tebúk, the second village on the road, and the last till Medina is reached, is a small palm settlement in the desert. On the left stands Jebel Sherrâra, called by the Hajis, from its shape, el Munhir, "the pulpit," upon the flat summit of which, they say, Mahomet once stood to preach to the unbelieving Arabs. On the right stands el-Harra, the upper part of which with three tooth-like peaks rising above it (afterwards ascertained by Mr. Doughty to be the remains of extinct volcanoes) is of a pitchy black colour. The Harra extends southwards for a hundred miles, but beyond Tebúk it lies at such a distance from the Haj route that it is for a long time out of sight.

In the second march from Tebúk the kella of el-Akhdar was reached, and from this point on to Medyin Salih, three marches off, there is no water to be depended on. The only hope is at Birket Moaddam, where there is a good cistern, but one which cannot be filled in rainless years. In such a case a dromedary messenger is despatched from Medyin Salih to Damascus a month before the pilgrimage, and a supply of water-skins is procured by the managers of the Haj to be filled at el-Akhdar, whence they are carried by hired Beduins at the expense of the public treasury.

At Medyin Salih, which is a level plain, 16 miles long, and as many broad, encompassed by sandstone precipices, the perils of Mr. Doughty's adventurous journey were increased by the fact that he was now left alone, the rest of the pilgrims pursuing their way to Medina and Mecca. Fortunately for him, the surveyor of the kella, whom he had met at Damascus, and who had there promised to receive him and accord him his protection, kept his word. Some of the members of the garrison were far from being well disposed, and there was further danger to any one wandering beyond the precincts of the kella from the hordes of plundering Arabs who make forays in the neighbourhood. But, notwithstanding these dangers, Mr. Doughty managed in the ten weeks that elapsed between the departure and return of the Haj to see all that he had come to see of the antiquities of Medyin Salih, which lie at a distance of a mile from the kella.

Medyin Salih signifies cities of Salih, and Salih, according to the old Arab fable, was a prophet who preached to the unbelieving people of

el-Hejr until a judgment fell upon them, an event which is referred to in every five or six chapters of the Koran, so that el-Hejr is a site of some renown in the Mohammedan world. Hejr, Ἑγρα in Ptolemy, Hejra in Pliny, was formerly an emporium on the old gold and frankincense road of the Sabæans. The site was easily found by Mr. Doughty, but the ruins have disappeared. No doubt the houses, as at Petra, were of clay, and the only remains that now mark their site are bits of broken glass and potsherds.

The monuments, "the houses of the unjust," as they are called, are hewn out in the crags close to the sites so indicated. They are all finished in the same style. On the top of each is to be seen the stepped ornament so common at Petra. Entering the first of these, Mr. Doughty saw that they were sepulchral chambers. Graves are sunk in the floors, and in the walls are shelves of the size of the human body, from that of a child to that of a man, but so shallow that it was impossible to see how a natural corpse could have been laid in them. Human bones were found in the graves and on the floors of the chambers, and along with these were found various remains, mummy clouts of finer or coarser fabric, pieces of thick leather, possibly camel's hide, sewed together and having the welts smeared with bitumen, and a substance called by the Arabs *vakhour*, "incense," all indicating how the bodies were embalmed and preserved.

The façades are sculptured in the same soft sandstone as that of Petra, and are full of cornices and pilasters, showing a strange barbaric imitation of Egyptian and Greek temple architecture. The ornaments of the pediment are singular. Those upon the side are commonly shaped apparently to resemble urns; other side ornaments resemble griffins. Such ornaments are seen upon a fourth part of the monuments, which number in all nearly a hundred. In certain cases there is to be seen upon the tympan the strange ornament of a man's head with the braided side-locks now called "horns" by the Arabians. The most quaint is that of a face round as the sun shooting out the tongue. At a gorge in the adjoining mountains of Ethlib, which resembles the *sik* at Petra (a gorge in which is a hall, the only excavated chamber at Medyin Salih not a sepulchre), there are a number of engraved tablets on the rocks, and on these the figures are sometimes like pillars, standing singly or two and three together, the isolated pillars sometimes forked or horned at the top. Above is an engraved inscription.

As for the inscriptions generally, Mr. Doughty at once perceived that they were in a Nabathean-like character, and as it was these for which he had braved so many hardships and dangers, he immediately began to make preparations for copying them. To effect this was a work of great difficulty, and of the most irksome nature. At the time of his visit the plague of flies made long-continued working in the open air almost unendurable; the inscriptions were difficult to reach; and on certain

days he and his attendants were absolutely confined to the kella by the fact of the plundering Beduins being in the neighbourhood. But, notwithstanding these inconveniences and dangers, he was able to take copies of more than 200 inscriptions, or about half the whole number, which were as many as he could reach by the means at his disposal. To get even at those which he did manage to copy he was obliged to use a rudely extemporised ladder. The copies or impressions were made by means of bibulous paper which he laid over the inscriptions and then swept with a wet brush.* The inscriptions are mostly short, about a line or two in length, but a few extend to many lines.

Having made as many copies as he could at Medyin Salih, Mr. Doughty proceeded southwards to the village of el-Ally, about 11 miles off in the desert, in quest of the site of another old town which was said to lie near. This he discovered in the Wády-el-Kurra beside el-Ally, and on the cliffs behind it he found a number of other inscriptions, but these he was astonished to observe were not in a Nabathean-like character, like those of Medyin Salih, but in a character resembling the Himyaric. In the same cliffs he discovered sepulchres in the form of holes or loculi cut back from the face of the rock and surmounted by very extraordinary ornaments.

Mr. Doughty heard at el-Ally that the name of Baith Naam is handed down by tradition as an old name of the village, and he raises the question whether we have here the long sought-for Badanatha of Pliny.

By the time all these labours were accomplished it was February 1877. The Haj returned, and Mr. Doughty took the opportunity of sending his collections by a sure hand to Damascus, but he himself remained at el-Hejir.

II.—WANDERINGS IN NEJD AND RETURN TO JIDDA.

After his successful visit to Medyin Salih, Mr. Doughty originally intended to visit Khaybar, but he now determined first of all to devote a year or two to observing the Semitic life and studying the geological structure of the country. Fanatical, ignorant, and often ill-disposed as he found the Beduins of the old Wahabi borders to be, he managed to make the friendship of a few of the sheikhs, and wandered in spring eastwards to Nejd, returning again to el-Hejir. During the hot summer he explored the lofty and cool Harra, which he now found to be a platform of sandstone overflowed to a great depth by stream after stream of basaltic lava. In some of the side valleys the lava attains a depth of more than a hundred fathoms. Standing upon one of the heights of this lava platform, which was full of stones having a metallic ring like iron, he could see that it was studded with

* For further information on this subject Mr. Doughty refers to a notice by Professor A. Sprenger in 'Globus,' 1880, p. 201, and to a notice by himself in the Journ. B. A. S., Bombay Branch, 1878.

numerous extinct volcanoes and *volcanelli*. From a single encampment as many as thirty craters could sometimes be descried at once, mostly from 200 or 300 to 600 or 700 feet in height. The highest, *Jebel Anáz*, was estimated by Mr. Doughty at 1000 feet or more. The mode in which the lava covered the sandstone cliff to the very edge, seemed to the traveller to afford a striking illustration of the way in which the basaltic covering protected this portion of the original sandstone plain from denudation.

The hot summer over, Mr. Doughty went in the autumn to Teyma, a place of which mention is made in the Hebrew prophets. The remains of the ancient Teyma are now a strange sight in the desert. The town itself was probably of clay and has disappeared, but the old city wall, three miles in circumference, still stands, along with some great old columns of barbaric workmanship, possibly the relics of some temple. Both the Teyma and el-Ally of the present day are resettlements. The Teyàmane are a colony of Shummar founded some 200 years ago. There Mr. Doughty found a few inscriptions in a character not observed by him elsewhere, but of which Sir Henry Rawlinson afterwards expressed the opinion that they were very ancient and allied to the Phœnician. At Teyma Mr. Doughty remained about a month, namely, till the date harvest, when he took the opportunity of joining a market party on their return to their encampment in Nejd, and from that encampment he rode over the desert with another market party to Hayil.

From Hayil, after a stay of more than a month in the winter of 1877, Mr. Doughty went to Khaybar, the goal which he had kept in view more or less during all the previous nine months. From el-Ally, Khaybar is only 66 miles, or hardly two dromedary marches distant; but it was only after travelling nearly 600 miles, and after a journey of no little danger, that Mr. Doughty finally reached the spot. The peril in Mr. Doughty's case was increased by the fact that he never attempted to conceal his nationality and his faith. He was known everywhere as *Engleysy* and *Nasarany*—an Englishman and a Christian; and though he does not think that all travellers are called upon to follow the same course, he yet claims to have by so doing made the name of Christian respectable, instead of abhorred, as it was before, in a vast stretch of country, and hence to have made the country easier to traverse for subsequent travellers.

Mr. Doughty left Hayil on his way to Khaybar with another market party, but on the third day the party was obliged to follow another route and left him in a solitary tent, the owner of which was absent at the time. Fortunately the latter received him hospitably, and handed him over next day to the care of the sheikh. Here he was only 100 miles from Khaybar, but the way was through a rugged country infested by camel robbers. For three long journeys he rode with one attendant over

black craggy lava fields with extinct volcanoes, called by the people *hilly hillian*. It is in fact another Harra, and is known as the Harrat Khaybar. Near the middle of the region Mr. Doughty found the altitude to be nearly 6000 feet, and he afterwards ascertained that this is the water-parting between east and west in Northern Arabia, the waters running down eastwards into the great trough known as Wady e'-Rumma, and westwards into the Wady el-Humth. The former has long been known, and Mr. Doughty found its head near the villages of Hayat and Howeyat on the eastern border of this volcanic region, and ascertained that its mouth was at Sheyer near Bosra, so that if it were a perennial stream, instead of a dry trough hardly flushed once in a generation, it would be an affluent of the Euphrates. Mr. Doughty partly traced the course. The other Wady was unknown to European geographers till Mr. Doughty's visit. Mr. Doughty learned by inquiry from trustworthy sources that its head is in the steppes beside Tâyif somewhat inland from Kurn el-Menâzil, and its mouth on the Red Sea between el-Wejh and Yanba. It receives not only the western waters of the Harrat Khaybar, but afterwards those of the Harrat el-Aneyrid.

At Khaybar Mr. Doughty hoped to find himself among friends, and to be able to rest and recover from the fatigue and privations of his journey. But he found it quite different. Khaybar, formerly subject to Ibn Rashîd, had lately been taken over by the Turkish Government of Medina, but though he had with him a Turkish circular passport, that proved to be of no avail with the aga or commander of the black troops, mostly freed slaves, occupying the place. At the time of his arrival, the winter of 1877, the war was going on between the Sultan of Islam and a Christian State, and he was taken for a Muscovite spy. He was arrested, and placed under guard, and his money taken from him. For ten weeks he expected daily to be led out for execution, and he owed his life chiefly to the protection of the solitary white inhabitant of the place, a man of great force of character. At last an order came from the Pasha of Medina for his immediate release.*

The spring of 1878 had now arrived, and Mr. Doughty found himself compelled to return to Hayil, whither he was conducted by Beduins in fifteen days.†

On his arrival, he found the emir absent and his deputy hostile, and his Beduin conductors were commanded to take him back again to Khaybar. On the third day they treacherously forsook him, and on more than one occasion he found difficulty in getting himself hospitably received by the nomads of the desert, though as a rule he managed ultimately to secure their friendship. Arriving one evening at Boreyda, his faith was discovered by his not betaking himself to prayer at the cry of the Muettin, and the populace at once set upon him and stript him of

* For the topography of Khaybar see 'Globus,' 1881, p. 39.

† For the topography see 'Globus,' 1881, p. 214.

all that he had. Though the emir interfered and insisted on everything being restored, the populace still continued to cry out for his death. In the end, however, the emir managed to appease the uproar, and promised to send him on the next morning to Aneysa.

Boreyda and Aneysa are the two largest towns in Nejd, and are built in the Nefūd on either side of the Wady e'-Rumma at the distance of not more than eleven miles from each other. They have existed for only about 300 years, and the former numbers about 5000, the latter about 7000 souls.

On the morning after the disturbance at Boreyda, Mr. Doughty rode out towards Aneysa accompanied by a camel-driver, but acting on the secret commands of the treacherous emir of Boreyda, the latter deserted him about a mile from the walls of Aneysa. Here, nevertheless, Mr. Doughty was received in secret with great kindness by the "philosophical" emir and certain rich merchants who have traded of late years to Jidda, Bosra, and Bagdad. Though themselves well disposed towards him, they regarded it almost as the act of a madman that he should frankly confess himself in every place a Nasarany, and still more an Englishman, in a country in which they themselves were full of apprehensions when travelling through it.

At Aneysa Mr. Doughty was able to remain in peace for several days under the protection of these influential friends, but at last the populace began to murmur here also against the Nasarany, and finally to stone him in the streets. Thereupon the emir thought it best to send him away, and without the cognisance of his merchant friends he was despatched southwards over the Nefūd of el-Kasim to the town of Khubbira.

Mr. Doughty was now in great straits. His money was nearly all spent, and though he had some medicines with him, these were a poor resource among the Arabs, who never pay for medicines, only for cures. But while thinking rather drearily of his situation, he got word from Aneysa through the camel-driver who had brought him thence and had since returned to the town, that at the intercession of his merchant friends, the emir had recalled him. Riding back in the night to escape the notice of the predatory Beduins, Mr. Doughty re-entered Aneysa, but was at once sent by the emir to live amidst an outlying clump of palms till the caravan should be ready to set out, so that he might be able to accomplish his journey to the coast in safety. In these quarters he lived for two months.

The caravans being at last ready to set out, Mr. Doughty's friends offered to send him in whatever direction he pleased, whether eastwards to e'-Riath, northwards to Bosra, or southwards to Jidda. Choosing the last route, he would be compelled to accomplish the last stage of the journey to the coast as best he could, for the caravan that set out in that direction proceeded not to Jidda itself but to Mecca. That increased

the hazard of that course, but nevertheless Mr. Doughty was induced to select it in the hope of finding on the way other great Harras, and thus obtaining further material for solving the riddle of the great volcanic countries in Arabia.

The midsummer of 1878 was now past when the yearly caravan carrying *samma* or clarified butter to Mecca was ready to set out. This *samma* is what is called *ghí* in India, and in Arabia it is an important article of commerce among the nomads, who derive it from the milk of their ewes and goats. The caravan which Mr. Doughty accompanied went down with 170 camel loads or nearly 60 tons, the value of which was many hundreds of pounds sterling.

The caravan ascended the Nefúd of el-Kasím and the Wady e'-Rumma to e'-Russ, where it came to a high steppe on a basis of granite and studded with granite and basaltic mountains and knolls. The journey across this region lasts fourteen days, till the brow of the Mecca country is reached. On this elevated steppe Mr. Doughty saw the best natural pasture that he came across anywhere in Arabia, and yet the country is quite unsettled. The only way in which this could be accounted for is by the fact that the ground water is bitter and unwholesome. Sweet water is found only in one or two places in the whole journey. This region is the wandering ground of the great Beduin nation, Ateyba. The presence of the pastures is due to yearly rains. These uplands seem to be "under the tail of the monsoon." At Táyif the people look for the tropical rains to fall for five or six weeks together, commencing at the end of August or the beginning of September. That rain falls in abundance, so that there is much mountain land in Yemen adjoining e'-Táyif, which is *aard baal*, that is, on which corn can be sown and reaped without irrigation.

In the last days of the journey the caravan passed alongside of the great southern Harras, where the lava has been poured out upon a granite basis. The border of the Harra is from a few feet in height to 100 or 200 feet, and upon the top are to be seen high *hillian*, or extinct volcanoes. The lava flows are very massy and dark coloured. The surface was in many places crusted with salt, which is also met with upon the Harrat Khaybar, and may, Mr. Doughty thinks, be a volcanic product.

The caravan now descended to the ancient station Kurn el-Menázil, where those about to enter Mecca put off their secular clothing, wash themselves, and gird their bodies with the *ihram*, or loin-cloth, no doubt an ancient garment of the Arabs. In this guise all the pilgrims must enter the city bareheaded, and continue so, not even covering themselves by night, until all their religious duties are fulfilled.

The next morning the caravan arrived at Ayn e'-Zeyma, where Mr. Doughty would have to leave it and proceed on his journey alone. As he was about to do so he was again put in danger of losing his life

through the fanaticism and cupidity of a nomad sherif or descendant of Mahomet. The rumour had preceded him that a Nasarany was in the caravan, and as he alighted this sherif rushed out, crying that he must turn Muslim, or he would kill him, and that Allah had sent him his dromedary as booty. The other Arabs in the caravan stood aside inactive, but an old negro, umbrella-bearer to the Sherif of Mecca, had just arrived from Mecca, and, hastening up, managed partly by force and partly by threats to prevent the nomad from effecting his purpose, and ultimately persuaded him to accuse the Nasarany before the great sherif their master, who was now holding his summer court at Tâyif.

As it was now evening, and the Mecca caravan travelling by night was about to move onwards to e'-Tâyif, they took Mr. Doughty along with them, to be hanged, as they said, the day after by the commandment of the great sherif. When morning arrived, the caravan was again at Kurn el-Menâzil, and here Mr. Doughty's assailant of the previous evening again drew his knife upon him, and was now joined in his attack by others, who stript him of all he had and ill-used him in various ways. The adventurous traveller's hardships were over, however, when the caravan arrived the next morning at Tâyif. Mr. Doughty was indeed brought before the great sherif and accused by his assailants, but the sherif behaved with the utmost kindness, directing him to be entertained at the house of his aide-de-camp, who showed him every possible consideration. The great sherif himself spent hours in conversing with him about his travels in the land of the Arabs, and offered of his own accord to provide him with a safe-conduct to visit Wady Beeahy (the Pish-on of the Bible, according to Sprenger) and the old incense valley, Wady Danâsir. These offers Mr. Doughty in his exhausted condition was obliged to decline, but the sherif determined that he should at least see all that was attractive, strange, or beautiful in Tâyif itself, and after enabling himself and his dromedary to rest for a few days, sent him on with a sufficient escort to ride by easy journeys to Jidda.

III.—CONCLUSION.

The Semitic East, the settled Arabian borderlands more commonly visited by Europeans, are lands of sepulchres and ruins; and desert Arabia, farther inland, likewise has the aspect of a decayed country. The sun has set upon the ancient mercantile Arabia of the caravans, and the better spirits even among the Arabians themselves acknowledge the decline that has taken place. The ancient Arabians bored deep wells in the earth and rock, and secured them with good dry stone masonry; they built houses commonly of stone, whereas the supine Musselmin are clay builders, and in favourable spots they constructed dams for irrigation works. Now all these are lost arts in Arabia, or survive only

amongst the Beni Temmim, an ancient tribe in el-Kasim. The Beduins do not bore, they only dig with their hands and a stick shallow pits which they call *themyel*, when the ground water is near the surface, or not at a greater depth than two fathoms. The great deserts are full of wells, but they all belong originally to a remote period.

Among the most ancient Arabian remains are huge erect stones of the kind that would be called in Britain Druidical, and buildings composed of huge blocks such as those to which the epithet Pelasgic or Cyclopean would be applied in the countries bordering on the Mediterranean. As for the inscriptions, those from Teyma are shown by the character in which they are written to be of a high Biblical antiquity. With regard to the monuments of Medyin Salih, nothing can be determined until the inscriptions are deciphered. All those copied by Mr. Doughty will be published, with the interpretations by the Academy of Paris, within the next two or three years. The façades at el-Hejr Mr. Doughty conjectures to date from the earlier centuries of the Christian era.

That a Himyaric town existed at el-Ally there can, Mr. Doughty thinks, be no doubt. The character of the inscriptions, though not, according to M. Halévy, exactly like the Himyaric of el-Yemen, proves this, and there is indeed nothing extraordinary in the fact of a Himyaric colony existing in that situation when we consider that even in Syria, hundreds of miles farther north, certain towns, such as Hums (*Emisa*) and Baalbek (?) were in later times reckoned to be Himyaric.

The later historical remains of Arabia date at the earliest from little before the time of Mahomet, that is, from about the fifth and sixth centuries of our era. It is unlikely that there are any remains of a lettered antiquity in Arabia at all comparable in point of age to the monuments of Egypt. But what is the antiquity of even these monuments in comparison with that of the poor flint implements which Mr. Doughty found in the gravels of Arabia Petrea?

Prehistoric monuments, or at least monuments of old uncertain age, are the structures known as *rījūm*, built of unhewn stone, seen by Mr. Doughty in the valleys and on the surface of the great Harrat el-Aneyrid, beside Medyin Salih. At one place Mr. Doughty came upon a cluster of 150 of them standing together. They are shaped like beehives, about 25 feet in diameter, and 12 feet high, and are each built over a sepulchral cell, or perhaps two, access to which can be obtained through a hole in the top, down which the dead body was no doubt shot—a mode of burial still in use among the Latin nuns in the time of Sandys' travels to Jerusalem. Upon the *figgera*, or lava coast above Khaybar, such barrows had the form of simple domes, built of unhewn stone, without mortar, of about the height of a man, sometimes surrounded by a ring of stones.

These latter are, according to Mr. Doughty, not unlike the *namous* (pl. *nawamis*) of Sinai, which are believed by him to have served the same

purpose. A few miles north of the monastery Mr. Doughty found one to be still used by the Beduins for a charnel-house.

Diagrams representing these monuments were shown by Mr. Doughty, and another was exhibited representing three renowned idol-stones, or blocks which were objects of worship among the ancient Arabians. The stones are of grey granite, and lie at Tâyif, and are from 12 to 26 feet long. The principal of these is *Hubbal*, the god of divination; a second is *Uzza*, a word which also means a palm or an acacia tree; and the third is *el-Late* (Allât), which we have the testimony of Herodotus for regarding as the Venus of the Arabians.

Such stones are conjectured by Mr. Doughty to be not so much divinities as *menâhil*, that is, spots at which the *mebuk*, or powers of the air descended to the earth. Among the Beduins such *menâhil* are usually trees, it may be an acacia, an evergreen oak, or a group of wild figs, and various examples of the superstitious ideas held by the Arabs in relation to these supernatural descents, were given by Mr. Doughty. Some of these ideas were not unlike our own popular superstitions regarding fairies.

Mr. Doughty also exhibited the horn of an animal not known to European naturalists before his travels as an inhabitant of Arabia. It is called in the border-lands Bakr-el-Wahesh, or wild cow, but by the true Arabs Athyafri. It is an antelope like the *beatriz*, and lives in the sandy deserts of Sherrarat and in the sandy tracts of the Kahtan and Muna in the country inhabited by nomads in el-Yemen. Mr. Doughty first saw the white skins of the animal at Maan in 1875, and afterwards he saw two tame specimens in the orchard of Ibn Rashid at Hayil.

The map prepared by Mr. Doughty is the result of two years' incessant labour, during which he always carried about with him an aneroid barometer, but no other instrument. The situations of (Petra), Tebâk, Teyma, Hayil, (Aneyssa), and Medina, are adopted by him from Dr. Kiepert's map.*

The geology of the Arabian Peninsula is of truly Arabian simplicity. A central core of Plutonic rocks is overlaid by sandstones, and these again by limestones, sometimes with flints. The latter rocks appear again between the Dead Sea and Jerusalem, and, Mr. Doughty apprehends, underlie all Palestine, and encompass the greater part of the Mediterranean Sea. They are probably of nearly the same age as our chalk (which may be tested by the fossil fish from Moab), while the underlying sandstones would correspond to the "greensand." The Nefûds or deep sandy deserts are composed of material derived from these sandstones. Signs of volcanic activity can still be seen on the Harras. Certain crevices in the Harrat Khaybar are sometimes

* The map we publish with the present memoir is a reproduction of Mr. Doughty's map. We have not ventured to alter the positions or the orthography.—[ED.]

seen smoking in the cold winter mornings, and steam may in certain weathers be observed issuing from the summit of Jebel Ethnan. Outbursts of volcanoes in the neighbourhood of Medina and Khaybar have taken place within Mahomedan times.*

Being asked by Sir H. Rawlinson to give his opinion of the political condition of Nejd Arabia, Mr. Doughty replied that till recently Nejd was made up of three states, that of the Wahabis in the east, Boreyda in the middle, and that ruled over by Ibn Rashid in the west. This conditions of things has, however, been altered by the fall of the Wahabi dominion,† the territory formerly belonging to which is now mostly in a state of anarchy, while Aneysa has acquired its independence. The principality of Boreyda is small, and is governed by a tyrannical usurper, who has under his sway some score of Kasim towns and villages, but no Beduins. Ibn Rashid has his capital at Hayil, a place with about 3000 inhabitants. The other villages and hamlets subject to him amount to about two score and their aggregate population may reach 12,000 or 13,000; the total settled population under his rule is estimated by Mr. Doughty at hardly 20,000. But there are besides a number of Beduin tribes tributary to him both on the south and the north, where all those as far as the Syrian border acknowledge his sway. His public revenue may be estimated as equal to about 40,000*l.*, and his fighting power at about 2000 men, drawn from the settled population, and about 1300 more from the Beduin tribes. The warlike qualities of the Arabs generally are held by Mr. Doughty in very slight esteem, and he ridicules the idea that Ibn Rashid threatens Medina. Medina is defended by more than a clay wall, which is enough to frighten an Arab army, and is besides held by a strong Turkish garrison with which the Arab soldiery are utterly unable to cope. The Arabs themselves do not think that the dominion of Ibn Rashid will last long. He waded to power through the blood of his kinsmen; he is childless, and is generally detested by the Beduins as a tyrant.

The following discussion ensued:—

Captain CONDER said he had spent a considerable time in Moab, Ammon, and the country north of that which Mr. Doughty had described, and that gentleman's explorations had thrown considerable light on the work of the Palestine Exploration Fund. Those employed in that work owed a good deal to the Royal Geographical Society, who had provided them with the instruments necessary for carrying it out. They had not as yet, however, had occasion to give an account of it before the Society. The most interesting part to him of Mr. Doughty's address related to the tombs, the inscriptions, and the diagrams of the rude stone monuments. The upper diagrams exhibited appeared to represent monuments of the kind already known at Petra. The lower diagrams represented square chambers in the rock, of a rougher

* See Carl Ritter's 'Erdkunde,' Arabien, ii. p. 165 *et seq.*

† See articles in 'Globus.'

kind. Those were also found in Moab, in the neighbourhood of Heshbon, and other places, where they were generally called *Rûák*, or porches. They were understood to be sepulchral chambers, and were connected in that district with Himyaritic traditions. With regard to the inscriptions, it was particularly fortunate that Mr. Doughty had secured so many squeezes, because it was an extremely difficult thing to copy an ancient inscription. Even men who had given the whole of their lives to the subject had sometimes made apparently slight but very important mistakes. One of the great problems remaining to be settled with regard to the Semitic alphabet was the connection between the North Semitic alphabet and the South Semitic alphabet, and that connection was expected to be found in the very district in which Mr. Doughty had been travelling and in the parts rather further north. In the southern parts of Moab four or five inscriptions had been discovered, which Professor Isaac Taylor, the greatest living authority on the subject in England, had pronounced to be very likely a new alphabet. The rude stone monuments were of extreme importance. The upper ones resembled buildings found by Sir Charles Wilson and the Sinai party in the Sinaitic Peninsula, but their exact meaning and origin had not yet been fully worked out. The lower ones were marked with the names of three principal Arab deities. The one marked *Allât* particularly interested him, because it showed a distinctly marked cup hollow in the upper surface. Those hollows had been traced very carefully throughout Moab. They had been found on the tops of dolmens and on their floor-stones, on flat rocks, and on menhirs. The deduction that he drew from them was the same as that previously arrived at by Mr. James Fergusson, namely, that they were intended to hold some kind of liquid, and were connected with sacrifice. As aids in the study of Semitic epigraphy and Semitic archæology, too high a value could hardly be set on what Mr. Doughty had brought home.

Mr. W. MARTIN WOOD said that in connection with the Asiatic Society of Bombay he had the pleasure of seeing Mr. Doughty in his Arab costume when he first emerged from his hardships and travels, and listening to a short paper referring to one part of his journey. He congratulated him on the wider stage which the Royal Geographical Society had afforded him for giving a description of his discoveries.

Mr. W. T. BLANFORD said the information about the occurrence of volcanic rocks upon plateaus in this portion of Arabia was entirely new; but volcanic rocks had been found in so many surrounding countries, that it was very difficult to say to which series those just discovered could be referred. Such rocks were noticed by Bauermann in the neighbourhood of Mount Sinai; by Tristram and others in the country between the Dead Sea and the Gulf of Akaba; they occurred all along the southern portion of both coasts of the Red Sea, and were enormously developed in Abyssinia. Judging by Mr. Doughty's sketch of those he had visited they must be of considerable antiquity. They were at a very great distance from those comparatively modern volcanic cones that were seen in the neighbourhood of Aden, and they appeared to be rather a form of interstratified or overlying lava—typical trap, in fact; it was impossible to say what their exact age was. He believed Mr. Doughty looked upon the sandstone as probably cretaceous.

Mr. DOUGHTY: Greensand.

Mr. BLANFORD said if that was correct it was rather an interesting circumstance, because the sandstone of the Sahara Desert was cretaceous. A very valuable and most important work had just appeared upon the Libyan Desert by Prof. Zittel, in which an admirable account was given of the surface characteristics. He divided the surface first into plateau-desert, nearly flat country, very stony, without sand. This occupied a very large portion of the desert, and consisted chiefly of sandstone, forming

enormous flats for very wide distances, but passing here and there into mountainous desert. In this great plateau there were also immense depressions formed by the action of water, probably similar to what occurred more or less in all deserts, and to some of the wadies of Arabia. Another division was the sandy desert, occupying a comparatively small part of the surface. If the sandstone in Arabia were the Nubian sandstone, it was very possible that its disintegration gave rise to much of the desert sand, as in the Sahara. Then the question arose, What is the connection between the lava flows of the "Harrats" and the volcanic cones on their surface? Was Mr. Doughty quite certain that there were volcanic cones on the top? Did he see any craters?

Mr. DOUGHTY answered that he knew the appearance of active volcanoes very well. He was on Vesuvius at the last great eruption of 1872.

Mr. BLANFORD said he should very much doubt whether the cones could be connected with ancient lava. The plateau appeared to be about 5000 or 6000 feet in height, and 20 or 30 miles across in places, while the cones at the top were of no very great height.

Mr. DOUGHTY: They are commonly from 200 to 700 feet; the highest is about 1000 feet.

Mr. BLANFORD said it must have taken a long time for the lava and sandstone to be worn away from the sides, and the action of denudation could hardly have carried away such a mass of lava without destroying the cones, if both were of contemporaneous origin. If the different plateaus resembled one another, it was probable that they were once united. There were two sets of basaltic traps in the peninsula of Sinai, and it was not at all impossible that there should be a continuation of one of these series of lava-flows throughout the whole of that part of Arabia. Sandstones were rather deceptive, rocks of various ages resembling each other in mineral character, but as cretaceous rocks were enormously developed in Arabia, precisely of the age of the upper greensand, it was far from improbable that Mr. Doughty's opinion of the age of the sandstone might be correct.

Mr. BLANFORD further said that he thought the animal whose horn Mr. Doughty had exhibited was the *Oryx beatrix*, which was also found in the neighbourhood of Muscat. Not long ago there was in the Zoological Gardens a living animal of this species.

Mr. TRELAWNEY SAUNDERS said with reference to the volcanic formations noticed by Mr. Doughty in Hejaz and Nejd, that similar formations were found further north in the classic region of Trachonitis, the Biblical Argob, on the south and east of Damascus. These include the separate lava masses of the Leja and the Safa, which have been described by Mr. Cyril Graham, Dr. Porter, Captain Richard Burton, and Dr. Wetzstein. Among the remarkable features of the Trachonitis, immense hollow hemispherical blisters occurred on the surface, produced by gases in the cooling of the lava. It would be interesting to know if similar features were noticed by Mr. Doughty.

The CHAIRMAN (Sir HENRY RAWLINSON) said the paper had dealt with so many subjects, that it was difficult to bring on an exhaustive discussion upon any one of them. The branch of inquiry in which he himself took most interest was the antiquarian. It might be remembered that when first the Sinaitic inscriptions were brought to light they created a strong sensation all over Europe. Mr. Forster, who first brought them to notice, convinced himself that they were records left by Moses on his return from Egypt, and he translated them accordingly in reference to the feeding of camels or the loading of caravans! It took a long time to disabuse him of his error, but the final blow was given to his theories when it was shown that he had read the inscriptions from right to left instead of from left to right. Since

then the subject had been very thoroughly examined by German *savants*, especially by Rödiger, and it was now perfectly well known that the legends in question were mere memorials of pilgrims passing along the routes to the ancient place of pilgrimage at Sinai. No doubt the inscriptions that Mr. Doughty had discovered were of the same class—probably not older than the first or second century of the Christian era—and the tombs and sepulchral monuments he should assign to about the same time. He had been looking over Mr. Doughty's book of inscriptions, and he found that a considerable number of the legends were in good Himyaritic writing. They could all be read with a little trouble, but still he could not believe that the Himyaritic character was in use so far north as Medyin. They were more probably inscriptions left by Himyaritic visitors, as from the south as well as from the north of Arabia, pilgrims were in the habit of passing through the country, and the Himyarites would of course write in their own language, just as the northern Arabs wrote in their language—Nabathæan. The Himyaritic was probably an older form of writing than the so-called Nabathæan, for there was a Babylonian cylinder in the British Museum dating from perhaps 1000 B.C., on which there was a Himyaritic legend. It was, however, quite a novelty in the science of palæography to find Himyaritic writing so near the north of Arabia. He might further observe, in reference to this subject, that there was apparently no great antiquity in Arabia; at any rate, there were no antiquarian monuments to compare in age with those of Egypt, Babylonia, and Assyria. As far as he knew, only one object of real antiquity had ever been found in Arabia, and that was discovered a few years ago by Captain Durand in the island of Bahrein, which seemed from very early times to have been in possession of the Arab tribe of Ogeir. This relic was the foot of a statue, on which was an inscription in ancient cuneiform, stating that it was the memorial of "Rimugas, the chief of Ogeir, and the servant of Inzag (or Mercury.)" The great value of the inscription was that it was not in a Semitic language at all: Inzag being pure Turanian. One of the inferences which he drew from this discovery was that there were originally two distinct lines of colonisation into Arabia: one Semitic, along the western coast from Syria, known in the Bible as the colonisation of Joktan; and the other Kushite, which was Turanian, and followed down the east side of the Gulf of Persia from the Euphrates, being figured in Genesis by the seven sons of Kush. Kush, he believed, merely represented a dark-coloured people, the word having that meaning; and this dark race would seem to have colonised the east of Arabia as the red race of the Semitic family colonised the west. They may have afterwards crossed the mouth of the Persian Gulf, and have settled on the Persian side, forming what Herodotus called the Asiatic Ethiopians. They perhaps existed even at the present day in the Belooch tribes, some of whom dwelt along the coast from the mouth of the Gulf to the Indus, and spoke a Turanian dialect called Brahûi, which they might have inherited from their Kushite ancestors, but which was entirely unconnected with the Aryan dialects spoken for thousands of miles on all sides of them. He mentioned this curious circumstance in reference to the general question of the colonisation of Arabia; but he would not dwell on it as there was a long interval of time between the date of the Bahrein inscription and the date of those which Mr. Doughty had discovered—an interval of perhaps 4000 years. Fortunately, a date could be approximately given to the Bahrein monument, because the great Assyrian king who conquered the island under its Turanian rulers, and recorded his conquests, was called Sargon I., and a monument of his had been lately found, giving his date as about 3800 B.C. In the case of the Bahrein stone it was thus possible to give a certain approximate date; but in the Semitic antiquities that could not be done. There was nothing to show that there was any greater antiquity at Medyin Salih or Teyma than in the Wady Negub or on the other lines of route in Northern Arabia. He did not

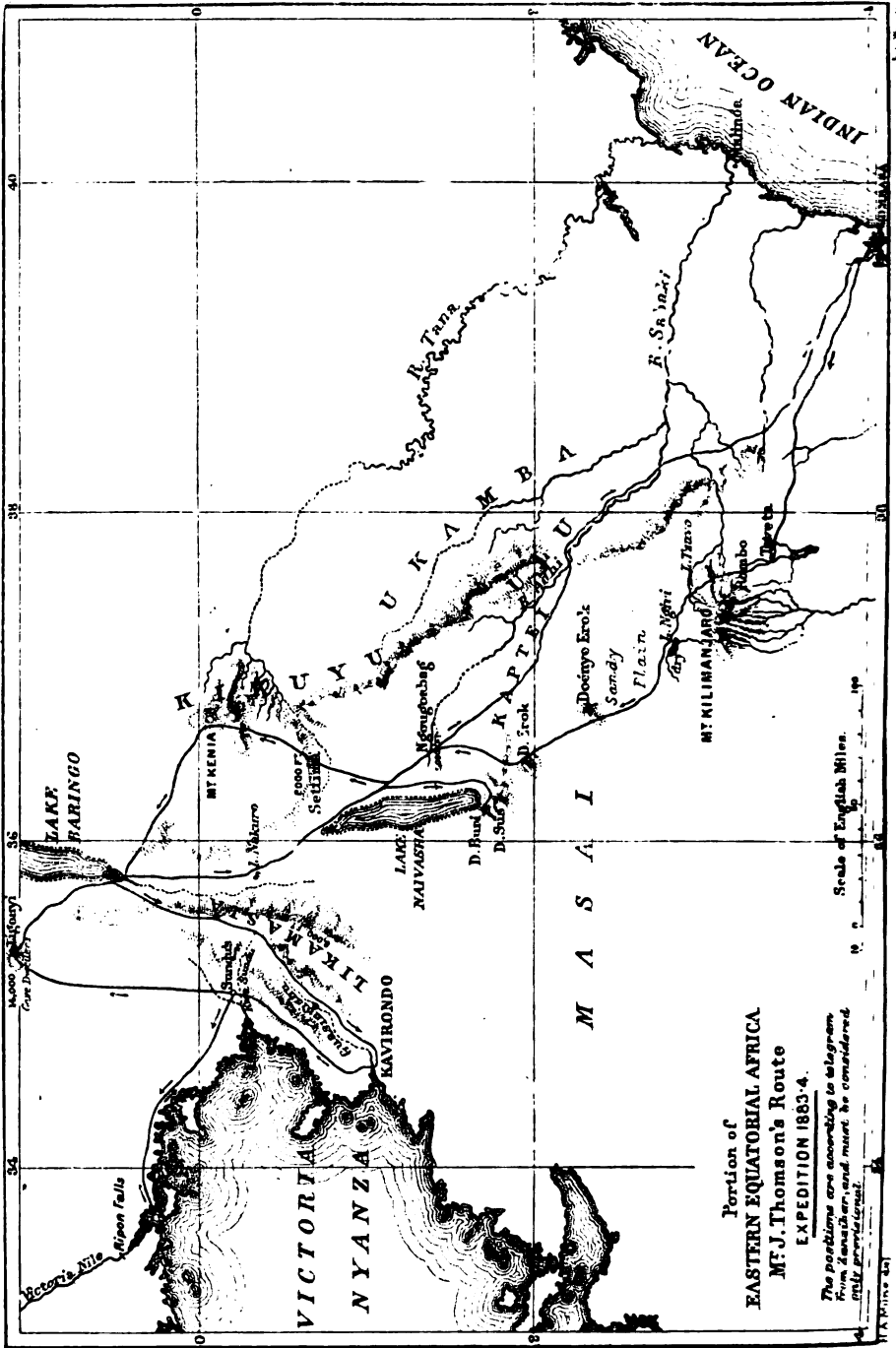
apprehend that any historical discoveries would result from the inscriptions which Mr. Doughty had obtained, though they were very curious and interesting, as showing that the inhabitants of Arabia, both from the north and south, about the time of the Christian era travelled along that line.* They may have gone to Mecca, because the black stone there had always been an object of worship, or Medyin itself might have been a place of pilgrimage, in consequence of which the Arabs might have invented the story of the prophet Salih, who preached to the tribes. In the Assyrian inscriptions, Arabia was frequently mentioned, but the Assyrians never seemed to have penetrated very far into the country, and its name did not occur in the oldest inscriptions, the earliest notice of it in any detail being in the annals of Sargon II., about 720 a.c. That king made an expedition into the country, and attacked, amongst others, the tribe of Themood, whose name was well known in history. He, however, went no further than a district which he called Barandi and which, he said, was the remotest point with which they were acquainted. Subsequent Assyrian kings were brought more immediately in contact with the Arabians, and reduced the frontier districts, but never penetrated far into the interior. At that time, however, as at present, the Arabian tribes had spread beyond the confines of Arabia Proper and all the Mesopotamian desert was covered with them. Probably forty different Arab tribes were named who dwelt about the Tigris, or between the Tigris and the Persian mountains, but only a few of those names were to be recognised to the present day.—With regard to the name of *namous* which Mr. Doughty gave to the tombs, of course, as the *m* and the *v* were undistinguishable, the true form should be *navis*, which was a word known wherever Arabic was known. *Navis* was originally Persian, but was adopted in Arabic and applied to any old cemetery. It had always been supposed to be a corruption of, or a cognate word with, the Greek *νάος*, and there were hundreds of *navises* about Mesopotamia, mentioned in the old authors.—One other point which he wished to refer to was the political question. Mr. Palgrave very much regretted not being able to be present, and had written a note in which he said he should have liked to learn from Mr. Doughty what the general state of the country was at present; whether the inhabitants were favourably disposed towards the Turks and Egyptians; how the English name was regarded by them; and what chance there was of the famous false prophet (the Mahdi) obtaining a footing among them. He (Sir Henry Rawlinson) considered that Arabia in its present state was by far the most dangerous ground in Asia in reference to this Mahomedan revival. If the false prophet indeed really intended to run the career which was threatening, his great success and great field of action would be in Arabia. Probably Mr. Doughty was there too long ago to be able to give any information on that point. Still, it would be curious to know if he ever heard any anticipations of a coming Mahomedan revival in Arabia, and if he considered that the Mahdi, appearing there as the last of the Imauns, would be received with favour. Ibn Rashid, who was so kind to Palgrave and to the Blunts, was at present the supreme authority in Arabia. He had entirely superseded the old chiefs of Baid and Dereyeh, and was regarded with great apprehension and jealousy by the Turkish authorities. If he and the Mahdi came together it was to be hoped that they would not coalesce. They were probably too much bent on the same object, and too much in the nature of competitors ever to be friends; but if they were to coalesce, the

* M. Renan, who has recently examined the Doughty inscriptions and is now lecturing upon them at the Collège de France, asserts that they throw much light on the early mythology of Arabia, and are thus of considerable interest.—H. R., June 25, 1884.

Turkish authority in Arabia would not be worth a day's purchase. In conclusion, he asked the Meeting to return their thanks to Mr. Doughty for the account of his adventurous and perilous journey. Henceforth his name would be inscribed in the front ranks of Asiatic travellers, and he would be regarded as a worthy companion to Wallin, Palgrave, Blunt, Burton, and the other great travellers who had journeyed in the interior of Arabia.

GEOGRAPHICAL NOTES.

Success of Mr. Joseph Thomson's Expedition.—The Society received a telegram from Zanzibar on the 11th June, announcing the safe return of the expedition under Mr. Joseph Thomson, and giving a brief summary of his route. The route showed that he had accomplished all that he had been directed by his instructions to attempt, and this without any hostile collision with the natives or the loss of a single life, except through illness. Thus, in one successful journey the dreaded Masai country has at length been successfully traversed, the snow-clad Kenia reached and its position fixed, the mystery of Lake Bahringo solved, and the East African range from Kenia to Kilimanjaro, with its extinct volcanoes, crossed and recrossed in various directions. The warm congratulations of the Society were immediately telegraphed to Mr. Thomson with a request for further details. The reply to this was the following lengthy telegram from Sir John Kirk, dated June 14th, for transmitting which we are indebted to the great liberality of the Eastern Telegraph Company:—"Thomson left Taveta last July, in company with a Pangani caravan; travelling northerly and passing Rombo, he reached the Masai country and crossed the head-waters of the Tzavo. Thence his route was more west; across the great sandy plain, the bed of a dried-up lake, of which Ngiri is a remnant. He reached Doenyo Erok on 19th August, and there met the Masai in numbers, but the caravan being so large they gave no trouble. Here he left the sandy, sterile plain, and entered the Kaptei district, a more broken country, rising in elevation to a plateau; this is a volcanic region with extinct cones, lying along a fault. September 5th he reached Ngougoabag, and the head-waters of the Athi (Adhi) in lat. $1^{\circ} 22' S.$, long. $36^{\circ} 32' E.$, altitude 5500, which forms the southern boundary of Kikuyu. Here he left the Kaptei plateau, and reached next the northern end of Lake Naivasha in lat. $0^{\circ} 43' 30'' S.$, long. $36^{\circ} 4' E.$ Lake Naivasha lies in a trough-like valley which extends to one degree N. lat., and divides the plateau. Lakes Nakolo, Bahringo, and numerous hot springs lie in the trough. He visited South Naivasha, Doenyo Susiva (Sus), 8000 feet high, a wonderful volcanic crater, and Buri (D. Mbuuro) [passage here unintelligible]. The Masai here were numerous, harassing, but there was no fighting. He sent Martin (his



Portion of
EASTERN EQUATORIAL AFRICA
M.F.J. Thomson's Route
EXPEDITION 1883-4.

The positions are according to telegram from Thomson, and must be considered fully provisional.

assistant the Maltese sailor) with the Pangani caravan to Bahringo. Himself with thirty men started for the Kenia plateau, 8000 feet, and there crossed the Settima. The northern end of the range was 12,000 feet high; he reached the base of Mount Kenia in lat. 3' S. The mount appeared to be a single cone, in height equalling Kilimanjaro. It is a sharp peak, snow-clad, and volcanic, lat. 10' S., long. 36° 45' E. Hence he proceeded to Bahringo, where he found Martin well; the Pangani caravan had gone north. The latitude of the south end is 28' N., long. 35° 47' E.; altitude 2600 feet. He then crossed Kamasia (Likamasia) range, 8000 feet, thence over the Quasingishu plateau, and by a gentle descent over a treeless plain to Kavirondo. He proceeded west from Kwasundu with few men, to Victoria Nyanza, in lat. N. 12', long. 33° 45' E. The north-east corner of the lake as represented on our maps must be cut off. He returned to Kwasundu, thence further north by Elgonys (Ligonyi) mountain, 14,000 feet; where he found wonderful artificial inhabited caves. He was tossed by buffalo and severely wounded on route to Bahringo, thence by Nakuro; was kept in bed two months at Naivasha, with acute dysentery. Returned to the coast by Ngungoabag, Kaptei, Ulu, Ukamba, to Mombasa. Money grant exceeded by 200*l.* owing to the delay; has drawn bills for 1600*l.* at one month. Proceeds in a few days by the Sultan's steamer to Bombay.

Mr. H. H. Johnston's Expedition to Kilimanjaro.—By the last mail from Zanzibar we learn that Mr. Johnston expected to start for Chaga on the 18th of May. With the assistance of Sir John Kirk he had got together what is likely to prove a most effective caravan, consisting of 120 picked men, and including natives who have had some experience in collecting and preserving zoological and botanical specimens.

The Journey of Prof. Euting in Central Arabia.—Prof. Julius Euting, the well-known orientalist, who left Europe a year ago to explore the settlements of the Beduins in the Arabian desert, and more particularly to search Jebel Shammar for oriental inscriptions, has, according to a letter just received from El Wehj, on the Red Sea, after a successful but dangerous journey, returned to Egypt. Among other things, he has discovered at Palmyra a hitherto unknown Jewish temple with a Hebrew inscription of great palæographical interest, and has further succeeded in obtaining a faultless copy of the celebrated *bilinguis* of Palmyra, containing a customs tariff equally interesting from a linguistic and an historical point of view, but so far published only in an inaccurate form. On the 27th of October last year, Euting arrived at the court of the Emir Ibn Rashid, at Hayil. Here he remained for three months constantly employed in collecting inscriptions, of some of which he managed with great labour to take casts from the rocks and buildings. By Ibn Rashid, Euting, who to be sure had to give up a

great part of his means as presents, was well received. The Emir himself is portrayed as an intellectually gifted ruler of amiable qualities, who showed much curiosity, without prejudice, as to the institutions and manners of the west. All the other members of the court, on the other hand, were a troop of arrant beggars. On the 23rd of January, 1884, Euting quitted Hayil, and in twenty-four days arrived, by cross marches, passing through Mohah, across Jebel Misma, and through Irnan, Birrd, and Helwan, at Teyma. Here he discovered a large Aramaic column with an inscription which he assigns to about 500 or 550 B.C. Since, in the meantime the silly report had got abroad that his box filled with casts of inscriptions contained pure gold, the cupidity of the Beduins began to be excited. On the occasion of an excursion from Teyma to Tebuk, he escaped several predatory bands only, as it were, by a miracle. And soon matters grew worse. First Euting went from Teyma to El-Hejr (Medyin Salih) where numerous splendid Nabathean inscriptions were obtained, and then to El-Oela (El-Alli on the maps), where 55 Himyaric inscriptions were found. From here the explorer, after various excursions in company with two half-savage Beduins of the tribe of the Beli, wished to proceed to the territory of the latter, the ancient Midian, with the special purpose of searching the fabulous ruins of Maghair Sho'eib, and afterwards the territory of the Geheineh stretching southwards from that region to Medina, for inscriptions the exact localities of which had been indicated to him. But he had scarcely set out from El-Oela when he and his companions were waylaid by a band of ten Geheineh robbers, and after a violent struggle for life and death, he was saved only by his intrepidity. He was compelled, however, to give up his plans, and he went to El Wehj, whence he arrived safely at Kosseir on April 20th.

The River Purus.—A tributary of this river has been named by the Brazilians the Chandless, in honour of the first explorer of the wonderful stream which Mr. Chandless ascended by boat in 1864 for a distance of 1866 miles from its junction with the Amazons. Last year a Brazilian steamer, the *Santarem*, ascended the Chandless, and discovered that it flowed from or through a large lake, as is so commonly the case with those tributaries of the Amazons which flow through level country. The abundance of indiarubber trees in the boundless forests of the Purus has led to repeated pioneer expeditions during the last few years, and these still continue to make interesting discoveries. An enterprising merchant of Ceará has established a *seringal* or indiarubber station at a place ten days' voyage above the mouth of the Chandless. It was calculated that the *Iça*, a steamer which started with cargo for the place in February last, would take 90 days' continuous steaming to make the voyage from the mouth of the Amazons to the indiarubber station and back.

Expedition to Mount Owen Stanley, New Guinea.—Mr. H. O. Forbes is making arrangements for visiting South-Eastern New Guinea, and penetrating to the Owen Stanley range, with a view to investigating its geography and fauna and flora. With the great experience he has gained during his seven years' exploration of the Malay Archipelago, he appears to be just the man to succeed in an enterprise like the one he is now contemplating. The cost of the expedition will be from 1000*l.* to 1500*l.*, which he hopes to obtain by grants from public institutions and subscriptions from private persons. The Council of the Royal Geographical Society have voted 250*l.* towards the sum required.

Inspector of Geographical Education.—The Council have appointed to this post Mr. J. Scott Keltie, editor of the 'Statesman's Year Book.' As stated in the advertisement on the wrapper of the June number of the 'Proceedings,' and in the public journals, the duties of the Inspector, who is appointed for one year, will be to inform himself thoroughly of the state of geographical education at home and abroad, and to collect the best text-books, maps, models, and other appliances published in England and on the Continent, reporting to the Council the results of his inquiries.

Errata in June No.—Page 330, line 3, for "green fodder," read "pack rope made of grass"; line 7, for "fodder," read "rope"; line 14, for "when," read "where." Page 331, line 1, for "wæbt" read "wæb."

Obituary.

Sir Bartle Frere, Bart.*—On 29th May, 1884, died the Right Honourable Sir Henry Bartle Edward Frere, Baronet, G.C.B., G.C.S.I., D.C.L., F.R.S., at his residence, Wressil Lodge, Wimbledon. He was born in 1815, and was buried in St. Paul's Cathedral, of London, on 5th June, 1884. By his death the Royal Geographical Society loses one of its most experienced and distinguished members. Therefore, a memorandum of his career necessarily claims a place in its annals.

Bartle Frere entered the Covenanted Civil Service of the East India Company in 1833, and was attached to the Bombay Presidency. He began his official life in the Bombay Deccan amidst the Mahratta people, and was employed in the settlement of the Land Revenue, a department which necessarily brings an officer into personal contact with the agricultural population. Then he became Private Secretary to the Governor of Bombay, Sir George Arthur, whose daughter he married; this lady has shared all the vicissitudes of his career, and is now his widow. As Private Secretary to the Governor at headquarters, he enlarged the knowledge of which he had laid the practical foundation while working in the interior of the country. Then he became British Resident in the Native State of Sattara, which was afterwards incorporated in the British territories. Next he was appointed in 1850 by the then Governor of Bombay, Lord Falkland, to be Commissioner in Sind. He was a young man for this post, which was (and is still) regarded as one of first class importance—though it was then even more interesting than it is now. But

* By Sir Richard Temple, Bart.

his talent and aptitude for affairs of magnitude were recognised, notwithstanding his lack of seniority. Though not exactly the immediate successor of Sir Charles Napier in Sind, he was the man who really took up the mantle of that great "soldier-civilian." It was in Sind that he won his spurs as "an all round man" in administration on an extended scale, relating to revenue and finance, to public works and improvements, to judicial system, to educational beginnings, to the management of mixed communities European and Native, to diplomatic arrangements with Native chiefs, and to frontier defence. Particularly in respect to the armed pacification of the Sind frontier he entered into the traditions of Sir Charles Napier, and thoroughly sustained the officers who exercised the joint military and political command there, especially John Jacob, William Merewether, and Henry Green. He was fortunately in Sind when the mutiny and rebellion of 1857 burst upon India. Though his position was somewhat isolated, he shifted well for himself and his province, making it a source, not of weakness, but of strength. He suppressed trouble within his own limits and spared European troops to help the southern Punjab. He won from John Lawrence the emphatic declaration that had Sind—which belonged to the Bombay Presidency in fact—been an integral part of the Punjab it could not have rendered more devoted support than it actually did. For his services at this juncture he received the thanks of Parliament, and was appointed by the Queen to be K.C.B. He was shortly afterwards raised to a seat in the Council of the Governor-General at Calcutta, and left Sind amidst the affectionate greetings of all classes, whose regard was signalised by the erection of a fine institution bearing his name at Karachi, the seaport and capital of the province. Thus as Councillor, he was a member of the Government of India under Lord Canning as Governor-General, from 1858 to 1862. In that capacity he evinced all the ability which had been fostered by his previous career. He was a favourite with his colleagues in Council, and the right-hand man of the Governor-General. He greatly assisted the Government in reconstituting the administration in provinces which had been overrun by rebellion and in reorganising that large portion of the Native army which had mutinied. He strove to maintain at its full height the high tone of the Government, rendering the administration both popular and respected. Then, from 1862 to 1866 he served as Governor of Bombay, a period chequered by the extremes of commercial prosperity and adversity, consequent on the rise in cotton during the American Civil War and the sudden depression of that staple of commerce when the conflict ended. His policy in reference to the State Bank of Bombay at this crisis, was subjected to much criticism when that institution failed. Whatever the public verdict may be as to his dealings with these adverse circumstances, there can be no doubt as to the masterly way in which he utilised the prosperous circumstances of that extraordinary time. For he seized the occasion to promote public works of material utility throughout Western India, to furnish Bombay with a series of structures that have made her one of the finest cities in the world, and to stimulate the wealthiest natives in a course of public-spirited benevolence. In three other cardinal respects he signalised his administration of the Bombay Presidency, namely, the revision of the settlement pertaining to the land revenue and to the registration of landed tenures, the beginning of local legislation under the newly formed Legislative Council, and the promotion of national education. In 1866 he resigned the governorship of Bombay in order to take a seat in the Council of India under the Secretary of State in London; and was appointed by the Queen to be G.C.S.I. In 1872 he was deputed by Her Majesty's Government on a special mission to Zanzibar, with a view to the more effective suppression of the slave trade in East Africa and the neighbouring seas. He was then appointed

a member of the Privy Council and a baronet of the United Kingdom. Shortly afterwards he signalised his unabated interest in the north-west frontier of India by a letter regarding Afghanistan, which on being published became historical. In 1874-5 he accompanied H.R.H. the Prince of Wales to India, and his conduct on that most interesting and important occasion was graciously approved by His Royal Highness. In 1875 he was appointed by the Queen to be *g.c.b.* In 1877 he was appointed to be Governor of the Cape of Good Hope, and to be High Commissioner in regard to the relations between the South African Colonies and the native tribes. In that capacity he endeavoured to bring about a confederation of these Colonies, and though the endeavour did not succeed, the failure did not arise from any shortcoming on his part. In his capacity as High Commissioner he directed the military operations to be undertaken against Cetewayo, the Zulu king, and the Zulu army, which had become formidable and minatory. This undertaking of his was not approved by the British Government at the time, was severely criticised in the British Parliament, and was assailed by several organs of public opinion. On the other hand, the necessity under which he acted was, and still is, maintained by some well-informed authorities, and by many who are interested in the safety of the Colonies and the protection of the Native tribes. He afforded all the moral support that he could, consistently with his position, to the religious missions of all denominations, and his name is thankfully remembered by the missionaries. In 1880 he returned to England on being relieved of his duties at the Cape of Good Hope. After his return home he was assiduous in writing and in speaking on the Oriental and Colonial affairs of which he had special experience. At the time of his being seized with mortal illness he was engaged in the preparation of a book relating to South Africa.

During a portion of this widely extended career he was an active member of the Royal Geographical Society. He was elected a Fellow of the Society in 1867, and a member of its Council in 1868, in which capacity he continued to serve up to the time of his last illness. He was its President for the year 1873-4. Before 1867 he had evinced his interest in the Society's work by taking an active part in the equipment of Livingstone's last expedition to Central Africa. Indeed, when Governor of Bombay in 1865, he invited Livingstone to visit Western India, and encouraged the public-spirited citizens to raise subscriptions and organise transport means for the great traveller in the African enterprise. He also gave Livingstone an official letter for the Sultan of Zanzibar in 1866. Subsequently, while at Zanzibar in 1872, he superintended the despatch of the expedition under Cameron for the relief of Livingstone. Returning home from his Zanzibar expedition, he read a paper on the geographical results of his mission. While President of the Society he took part in arranging the interment of Livingstone's remains in Westminster Abbey, and wrote an obituary notice of the great traveller. Under much difficulty also he consistently supported Stanley in the African explorations of 1873 and 1874. He further aided the cause of geography by acting as President of the Geographical Section of the British Association during the meeting at Exeter in 1869. Besides his Presidential Address on that occasion, he read a paper on the Runn of Cutch with the desert tract between India and Sind, thereby evincing a remarkable knowledge of physical geography. While in South Africa he continually transmitted to the Royal Geographical Society information of value. On his last return to England he read, in November 1880, a paper on "Temperate South Africa." It would be impossible to mention the many occasions when by advising, by lecturing, by speaking publicly, he promoted the objects of this Society. He was indeed a born geographer, and had a high estimation of geography as being fundamentally essential to some branches of knowledge and as auxiliary to many others.

In fact his whole career while qualifying him for success in many pursuits, qualified him particularly for the pursuit of geography. His out-of-doors life during the early years spent in Western India—a region abounding in geographical phenomena—gave him a taste for natural scenery and quickened his perceptive powers. He thus had a quick and accurate eye for the features and configuration of a country. Then he had an inquiring mind stimulated by laudable curiosity to know the why and the wherefore of everything that came under his observation. This habitual investigation was facilitated by his aptitude for eliciting information not only from intelligent and competent people, but also from the rude peasantry. A quiet patient manner of talking is needed to induce uneducated persons to mention the facts of individual experience, and this manner he possessed to perfection. His acquaintance, at once scholarlike and colloquial, with two, perhaps more, of the Indian languages afforded him special facilities in India. But apart from that, his insight into the character of alien races rendered him wonderfully apt in comprehending the conditions, physical and social, of all the many places with which he came in contact.

In his public life he evinced several qualities which immediately made him a leader of men, and endowed him with genius for directing affairs. In the first place he was extraordinarily sympathetic; he instinctively entered into the thoughts, feelings, and aspirations of others. Himself fired with a noble ambition, he sympathised instantly with those who were ambitious to do anything worth doing well. All men of originality and enterprise, all projectors of novel undertakings, all designers of good works, all explorers of unknown places, found in him a cordial coadjutor. In a progressive empire like the British few qualities are more valuable than this, and he possessed it in a remarkable degree. Then he had a glowing enthusiasm of disposition together with refinement of intellect and elevation of thought. His enthusiasm did not blaze like a bonfire blown about by the gusts of night. It shone like a serene pure ray of white light. To use an Oriental metaphor, he had a high-caste mind. He was a cardinal instance for those who maintain the heredity of genius, and who believe that purity of descent causes the transmission of eminent gifts or talents from generation to generation. So again, his untiring energy of mind and body was tempered by the calmer suggestions of reason and consideration, for he was eminently a thinking, even a pondering, man. He must have been in some degree excitable, but his self-discipline would have suppressed even the least appearance of excitement. During moments of public danger he was swift in action, though staid in demeanour, his habitual cheerfulness being unabated. When in critical emergency, he was in his native element. He was neither tardy nor hasty in making up his mind on difficult questions, being always sufficiently deliberate. But he had uncommon resolution in maintaining his convictions when once they were formed. Herein he invariably showed entire self-reliance, never doubting that he had grasped the truth, and that it must ultimately prevail. Consequently, he was fearless of consequences to himself, being thankful for good report if it were vouchsafed, but quite prepared for evil report should it come. He never shrank from facing responsibility, and never staggered under its weight. He was an admirable advocate of the cause espoused, both in speaking and writing. He had unswerving faith in the prevalence of reason and argument, being a really great master in written controversy. Those who differed from him would admit that no opponent was more difficult to overcome with the pen than he. His manner and delivery were too gentle for what is generally termed oratory or eloquence; but, though not an orator, he was very persuasive before mixed audiences. As a writer he had a capital style for many kinds of authorship. In conversation he was convincing in respect to general conclusions, and rich in imaginative illustration. By his every action or proceeding or policy, by his every word spoken or written, he was manifestly

struggling towards the light, and aiming at things great and noble. Even those who sometimes doubted the practicability or expediency of his aims could not deny their elevated character and their beneficent tendency. All his thoughts were dominated by a sense of what he believed to be his duty, according to his lights. When that goal had been perceived by him clearly, he moved towards it straight as one running to win a race.

With such a disposition he had a deep-rooted faith in the mission of England to sway, to enlighten, to improve, to civilise alien races in Asia, Africa, and Australasia.

“Tu regere imperio populos, Romane, memento,”

was his innermost idea, no doubt. But he desired empire for the sake of abstract good and not for selfish aggrandisement. Necessarily he gathered round him troops of friends among his own countrymen and among Europeans of several nationalities, whether in Sind, in Bengal, in Bombay, in South Africa, or in the United Kingdom. Few statesmen have ever commanded the friendly devotion of a larger number of persons than he. His personal friends were to be found among his brother civilians, among military officers, among merchants, and non-officials, among colonists, and among many classes of the British people. The sorrowing crowd in St. Paul's Cathedral at his funeral attested the general regard and affection. The Cape Parliament suspended its sitting on receiving the telegraphic announcement of his death; and the Government of that Colony directed their Agent-General to place a wreath upon his bier. In that section of the British community which exerts itself for the support and extension of religious missions in foreign regions, his memory will long be cherished.

Equally capable and effective was he in influencing for good the native tribes and races under his rule or authority. He gave them the most favourable impression of the British character and of practical Christianity. He made them believe in their own improbability, he lifted them as it were out of Oriental prejudice and bigotry, tenderly leading them into better spheres of thought and morality. Even with the mass of those who could hardly appreciate these higher ideas, he was popular and respected, being to them an ever-gracious presence.

With every one of whatsoever race or tongue he had the unfailing charm of a mild, modest, and refined bearing. His conversation and manner inspired every one with an interest in his fame and achievements.

Regarding some of the controversial passages of the last years in his public life, the sobering effect of time has yet to be felt, and the verdict of impartial history remains to be pronounced.

That he was faultless or free from error will never be asserted by discriminating friends. He himself would have been the very last man to make such an assertion, or even to dream such a thought. For he was from first to last a humble-minded Christian. So powerful an individuality, so marked an idiosyncrasy as his, must necessarily have had those co-ordinate defects which in human nature are almost invariably allied with great virtues and merits. We may apply to him the words which a contemporary applied to a British hero—

“He was true English;
His virtues and his failings English all.”

Lastly, we may associate with his memory the words of a well-known author respecting the promise that “finally in death itself their sleep should be sweet upon whose tomb it could be written,—Obdormivit in Christo.”

REPORT OF THE EVENING MEETINGS, SESSION 1883-4.

Thirteenth Meeting, 9th June, 1884.—The Right Hon. Lord ABERDARE,
President, in the Chair.

PRESENTATION.—*João Francisco Braga, Esq.*

ELECTIONS.—*Thomas Poultney Griffin, Esq.; William Henry Groves, Esq., M.A.; Alfred Andrew Langley, Esq.; The Rev. Robert Laws, M.A., M.D.; Sir Ughtred Kay Shuttleworth, Bart.; J. C. White, Esq.; William Samuel Whitworth, Esq.*

DEATH OF SIR BARTLE FRERE.

On taking the Chair, the PRESIDENT said his first duty was to refer to a great loss which the Society had recently sustained, and which none of the members would wish to be passed over without notice. He alluded to the death of their former President, and one of their most active and eminent members, the late Sir Bartle Frere. Sir Bartle Frere's was a familiar face at the meetings of the Society, and he never rose to speak without exciting the deepest interest and giving instruction in the most lucid language. He need scarcely refer to the great career of Sir Bartle Frere. This century had been fertile in producing men of conspicuous ability and great worth, but he might venture to say that no public servant had left behind him a purer and nobler name than Sir Bartle Frere. After filling various offices of great weight and importance, he became the Governor of districts as large as European Empires, and wherever he went, whether in Sind, Bombay, or South Africa, he invariably conciliated the affection and respect of those over whom he was set. Those who had lately had the privilege of reading the life of another eminent civil servant, Mountstuart Elphinstone, would know what sort of men the Indian Civil Service had produced, and would recognise many characteristics common to both Mountstuart Elphinstone and Sir Bartle Frere. Sir Bartle Frere's services to the Geographical Society were long continued and most valuable. As President he was not satisfied with the ordinary performance of his duties; he was a man of an eminently suggestive mind, always alive to the spread of the science for the propagation of which the Society was formed. As a member of the Council he took the most earnest interest in its affairs, and he was sure there was not one of his colleagues who would not lament him as a great loss to the Society, and as one in whom they had a friend of the most amiable and attractive character. He (the President) could but feebly represent his own esteem of Sir Bartle's character, and he was afraid the expectation of the members so far as regarded the eulogy deserved by so good and eminent a man. These few words however were due to the memory of one of their most distinguished Presidents.

The following paper was then read:—

“*Travels and Ascents in the Himalaya.*” By W. W. Graham.

The paper, with discussion, will be published in a subsequent number.

THE ANNIVERSARY MEETING, MAY 26TH, 1884.

The Right Hon. LORD ABERDARE, President, in the Chair.

ELECTIONS.—*John Acheson, Esq., R.N.; Joao Francisco Braga, Esq., F.G.S., L.S.A.; J. C. L. Knight-Bruce, Esq.; David Chadwick, Esq., Assoc. Inst. C.E.; David Henry Creighton, Esq.; Frank Benjamin Goode, Esq.; Sir Lepel Henry Griffin, K.C.S.I.; Lieut.-Colonel Richard B. Irwin, U.S.A.; P. Lloyd Jones, Esq.; Robert Michell, Esq.; Malcolm Cameron Murdoch, Esq.; Capt. T. Mills Richey, R.A.; Georg Emil Carl Selberg, Esq.*

The Regulations for the government of Anniversary Meetings and the Minutes of the Meeting last year were read by the Secretary, Mr. C. R. MARKHAM, C.B., F.R.S.

The PRESIDENT then nominated General Sir JAMES ALEXANDER, and Mr. R. A. McLEAN, as Scrutineers of the Ballot; after which the Secretary read the Annual Report of the Council, as follows:—

REPORT OF THE COUNCIL.

The Council have the pleasure of submitting to the Fellows the following Report on the financial and general condition of the Society:—

Members.—The number of Fellows elected during the year (ending April 30th, 1884) was 183. In the previous year, 1882–83, the total elections amounted to 163, and in 1881–82 the number was 150. The losses have been greater than usual, namely, by death 76 (including two Honorary Corresponding Members), by resignation 56, and by removal on account of arrears of subscription 65; thus causing, notwithstanding the large accession of new members, a decrease for the year of 14. In the year 1882–83 there was an increase of 37; in 1881–82, of 31. The total number of Fellows on the list (exclusive of Honorary Members) on the 1st of May was 3383.

Finance.—As will be seen by the annexed Balance Sheet, the total net income for the Financial year ending 31st December, 1883 (exclusive of balance in hand and 1000*l.* received from Mr. Leigh Smith), was 8599*l.* 9*s.*, of which 6211*l.* 0*s.* 8*d.* consisted of entrance fees and subscriptions of Fellows. In the previous year, 1882, the total net income was 7937*l.* 6*s.* 10*d.*, and the amount of subscriptions, &c., 5652*l.*; in 1881 the two totals were 8809*l.* 19*s.* 5*d.*, and 6480*l.* 6*s.* 6*d.* respectively.

The net expenditure for the past year (exclusive of balance in hand) was 8624*l.* 2*s.* 11*d.* including 1784*l.* 13*s.* 2*d.* spent on Expeditions. The net expenditure in 1882 was 8779*l.* 10*s.* 7*d.*; in 1881, 8362*l.* 5*s.* 6*d.*

The Finance Committee of the Council have held, as usual, monthly meetings during the year, supervising the accounts of the Society. The Annual Audit was held on the 21st of March last, the Auditors being, on behalf of the Council, Lord Cottesloe and Sir Rawson Rawson, and on behalf of the Fellows at large, E. O. Tudor, Esq., and J. Duncan Thomson, Esq. The cordial thanks of the Council and Fellows are due to these gentlemen for having freely devoted their valuable time to this important task. At the end of their labours the Auditors drew up the following Report to the Council:—

“The Auditors appointed for the examination of the Accounts of the Royal Geographical Society for the year ending 31st December, 1883, beg to report that they have examined the Balance Sheet submitted to them, and compared it with the Cash Book, Bankers’ Book, Petty Cash Book, and other books of account kept by the Society, and have verified the Balance in the Bankers’ Pass Book and in the hands of the Accountant; they have checked the entries in the Cash Book, and examined

all the vouchers for payments made, and have found the same to be correctly stated and sufficiently vouched.

"They have also had produced to them letters from the Chief Accountant of the Bank of England, and from Messrs. Cocks, Biddulph, and Co., Bankers, showing that the following investments were standing to the credit of the Society on the 31st December, 1883:—

	£	s.	d.
India 4 per Cent. Stock	1000	0	0
India 4 per Cent. Debenture Stock	2000	0	0
Great Western Railway 4½ per Cent. Debenture Stock	1800	0	0
London and North-Western Railway 4 per Cent. Debenture Stock	1000	0	0
North-Eastern Railway 4 per Cent. Debenture Stock	1000	0	0
Great Indian Peninsula Railway Guaranteed 5 per Cent. Capital Stock	4000	0	0
Caledonian Railway 4 per Cent. Preference Stock, No. 1	2000	0	0
Norwegian 4 per Cent. Bonds	1000	0	0
Consols (Lambert Donation)	526	6	4
Consols	4214	0	6
Consols (Peek Fund)	1000	0	0

"The falling off in the receipts from Entrance Fees and Life Compositions, and the increase in the arrears of Subscriptions, noticed by the Auditors last year, have proved but temporary. The subscriptions and other payments by Fellows have exceeded those of last year by 559*l.*, and the arrears have decreased from 1612*l.* to 1032*l.*

"The Financial transactions of the year exhibit a very satisfactory result. The ordinary receipts, excluding the balance on the 1st January and the extraordinary contribution of 1000*l.* from Mr. Leigh Smith, and allowing for Messrs. Stanford's cheque not brought to account in 1882, exceeded those of the preceding year by 483*l.* 15*s.* 1*d.*

"The expenditure of the year was 155*l.* 7*s.* 8½*d.* less than in 1882, although the sums paid for Expeditions exceeded those paid in that year by 649*l.* But it is right to notice that the expenditure of 1882 was abnormally increased by the cost of printing the Library and Map Catalogues.

"It is also satisfactory to notice that the cost of publishing the 'Proceedings' was less by 127*l.*, and that the receipts from the sale of them and from advertisements were greater by 71*l.* 9*s.* 4*d.* than in 1882.

"The contribution of 1000*l.* by Mr. Leigh Smith has enabled the Council to replace the amount sold out from the capital of the Society in 1882.

"The arrears of subscriptions, valued last year at 644*l.*, amount this year to 412*l.*

"The Investments and Assets of the Society on the 31st December, 1883, show an increase during the year from 39,675*l.* to 40,395*l.*

"The Auditors have pleasure in adding that the Books and Accounts have been kept, and submitted for their examination, in a very satisfactory manner.

<p>"COTTESLOE, "RAWSON W. RAWSON, "J. D. THOMSON, "E. O. TUDOR,</p>	}	Auditors.
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"21st March, 1884."

Receipts.

BALANCE SHEET FOR THE YEAR 1883.

Expenditure.

1883.	£ s. d.	£ s. d.	1883.	£ s. d.	£ s. d.
Balance in Bankers' hands 31st Dec. 1882..	453 2 2				
Do. Accountant's do.	15 14 11				
		468 17 1			
Subscriptions:—					
For the current year ..	3,553 0 0				
Paid in advance	566 0 0				
Arrears	492 0 8				
		4,911 0 8			
Entrance Fees .. ..	.. ..	540 0 0	House:—Taxes and Insurances, Repairs, Improvements and Furniture, Coal, Gas and Water-rates, &c. . . .	.. ..	455 5 8
Life Compositions .. ..	.. ..	760 0 0	Office:—Salaries and Gratuities, Stationery and Printing, Postages and Parcels, &c. . . .	.. ..	1,483 8 7
Payments made in error .. ..	.. ..	31 9 1	Library:—		
Parliamentary Grant .. ..	.. ..	500 0 0	Salaries and Books, &c.	.. ..	509 16 1
Royal Premium .. ..	.. ..	52 10 0	Map-Room:—		
Rent of Shop and Vaults .. ..	.. ..	135 14 5	Salaries and Gratuities, Maps, &c. . . .	.. ..	900 11 9½
Publications, Sale of, and Advertisements .. ..	.. ..	834 9 2	Meetings .. .. .	.. ..	180 11 10
Loan of Diagrams .. ..	.. ..	12 12 0	Scientific Purposes		
Payments for Scientific Instruction, and Subscriptions to Map of Eastern Equatorial Africa .. .. .	.. ..	21 13 9	Grant:—		
Contribution from Mr. Leigh Smith towards General Expeditionary purposes .. .. .	.. ..	1,000 0 0	Instruction to Travellers, Map of Eastern Equatorial Africa ..	.. ..	215 3 6
Dividends:			Medals and other awards	.. ..	177 2 6
North-Eastern Railway 4 per Cent. Debenture Stock .. . 1000l.	38 18 4		Publications:—Printing Proceedings, Maps, and Illustrations, Hints to Travellers, &c. . . .	.. ..	2,897 9 9
Great Indian Peninsula Railway 5 per Cent. Stock .. . 4000l.	246 2 11		Payments in error returned	.. ..	20 0 0
Great Western Railway 4½ per Cent. Stock [Davis Bequest] 1800l.	74 8 7		Investment: Purchase of 1000l. Norwegian 4 per Cent. Bonds .. .	.. ..	1,001 5 0
London and North-Western Railway 4 per Cent. Debenture Stock [Murchison Bequest] 1000l.	38 18 4		Expeditions:—		
Caledonian Railway 4 per Cent. Preference Stock .. . 2000l.	77 19 11		Expenses on account of East African Expedition	1449 13 2	
Norwegian 4 per Cent. Bonds .. . 1000l.	39 3 4		Contribution towards Consul O'Neill's Expedition	200 0 0	
India Stock .. . 1000l.	39 0 10		Instruments for Travellers, &c.	135 0 0	
India 4 per Cent. Debentures .. . 2000l.	77 16 8				1,784 13 2
Consols 3669l. 2s. 2d.	107 2 1		Balance in Bankers' hands 31st Dec. 1883 (excluding draft not cashed)	419 5 2	
" [Peek Fund] 1000l.	29 3 9		Do. Accountant's Do.	23 13 0½	
" [Beck bequest] 561l. 0s. 8d.	16 7 5				442 18 2½
" [Trevelyan bequest] 516l. 4s. 0d.	14 17 9				
		799 19 11			
		£ 10,068 6 1			£ 10,068 6 1

REGINALD T. COCKS,
Treasurer.

Audited and found correct, the 21st day of March, 1884.

COTTESLOE,
RAWSON W. RAWSON, }
E. O. TUDOR, } Auditors.
J. D. THOMSON, }

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to the 31st Dec., 1883.

	Year.	Cash Receipts within the Year.			Cash Amounts invested in Funds.			Deducting Amounts invested in Funds; actual Expenditure.		
		£	s.	d.	£	s.	d.	£	s.	d.
¹ Includes Treasury Grant of 1000 <i>l.</i> for the East African Expedition.	1848	696	10	5	..	..	..	785	6	1
	1849	778	3	0	..	..	..	1,995	7	6
² Includes Treasury Grant of 2500 <i>l.</i> for the East African Expedition.	1850	1,036	10	5	..	..	..	877	2	10
	1851	1,056	11	8	..	..	..	908	14	7
	1852	1,220	3	4	..	..	..	895	13	1
³ Includes Legacy of Mr. Benjamin Oliveira, 1500 <i>l.</i> 17 <i>s.</i> 1 <i>d.</i>	1853	1,917	2	6	..	..	..	1,675	6	6
	1854	2,565	7	8	..	..	..	2,197	19	3
⁴ Includes Legacy of Mr. Alfred Davis, 1800 <i>l.</i>	1855	2,584	7	0	..	..	..	2,636	3	1
	1856	13,372	5	1	533	10	0	2,514	8	1
	1857	3,142	13	4	378	0	0	3,480	19	9
⁵ Includes Legacy of Sir Roderick Murchison, 1000 <i>l.</i>	1858	3,089	15	1	..	..	..	2,944	13	6
	1859	3,471	11	8	950	0	0	3,423	3	9
⁶ Includes Mr. James Young's Grant for Congo Expedition, 2000 <i>l.</i>	1860	26,449	12	1	466	17	6	5,408	3	7
	1861	4,792	12	9	1,358	2	6	3,074	7	4
	1862	4,659	7	9	1,389	7	6	3,095	19	4
⁷ Includes 1000 <i>l.</i> 1 <i>s.</i> 6 <i>d.</i> sale of Exchange Bills.	1863	5,256	9	3	1,637	10	0	3,656	4	6
	1864	4,977	8	6	1,796	5	0	3,647	7	10
⁸ Includes Mr. James Young's Grant for the Congo Expedition, 1041 <i>l.</i> 1 <i>s.</i>	1865	4,908	8	3	1,041	5	0	4,507	4	8
	1866	5,085	8	3	1,028	15	0	4,052	15	8
	1867	5,462	7	11	1,029	0	6	3,943	17	4
	1868	5,991	4	0	1,557	3	9	4,156	17	10
⁹ Includes Parliamentary Grant of 3000 <i>l.</i> to Cameron Expedition.	1869	26,859	16	0	2,131	5	0	4,646	0	8
	1870	29,042	6	1	3,802	6	0	3,945	10	6
¹⁰ Includes Donation of 500 <i>l.</i> by Mr. C. J. Lambert.	1871	26,637	3	7	1,000	0	0	3,726	4	4
	1872	29,119	7	9	1,999	4	6	5,871	13	2
	1873	27,761	18	10	2,015	1	8	6,097	12	6
¹¹ Includes Legacy of Admiral Sir George Beck, 540 <i>l.</i>	1874	29,753	5	10	499	0	0	7,876	2	3
	1875	7,934	15	10	2,002	7	6	5,683	4	10
	1876	11,611	11	8	..	..	..	6,870	13	1
¹² Includes Legacy of Sir W. C. Trevelyan, 500 <i>l.</i>	1877	107,950	1	11	2,538	2	0	8,940	17	11 ⁰
	1878	118,124	10	0	3,000	0	0	6,361	9	6
¹³ Includes 1005 <i>l.</i> 8 <i>s.</i> 2 <i>d.</i> , sale of Exchange Bills.	1879	28,979	14	10	1,651	10	10	6,990	14	2
	1880	8,599	18	4	1,567	5	1	8,454	1	10 [†]
¹⁴ Includes 1000 <i>l.</i> received from Mr. B. Leigh Smith.	1881	8,809	19	5	..	..	..	8,262	5	6 [†]
	1882	28,942	15	0	..	..	..	8,779	10	7
	1883	29,599	9	0	1,001	5	0	8,624	2	11

* This sum includes the Special Parliamentary Grant transferred to the Cameron Expedition Fund in February, 1877.

† This amount includes the payment of two sums of 500*l.* each, contributed to the African Exploration Fund in this and the previous year.

‡ This sum includes the payment of 102*l.* 8*s.* to the African Exploration Fund; also 714*l.* 8*s.* 1*d.*, the final payment for Cameron Expedition Fund.

STATEMENT OF ASSETS—31st December, 1883.

	£	s.	d.
Freehold House, Fittings, and Furniture, estimated (exclusive of Map Collections and Library insured for 10,000 <i>l.</i>)	..	20,000	0 0
Investments (amount of Stock), as detailed in the above Report of the Auditors	..	19,540	6 10
Arrears due on December 31, 1883	..	£1032	
Estimated at	..	..	412 0 0
Balance at Bank	..	£419	5 2
„ in Accountant's hands	..	23	13 0
			<u>442 18 2</u>
Total	..	£40,395	5 0

Publications.—The monthly numbers of the 'Proceedings' have been issued regularly throughout the year, the completed Volume for 1883, the fifth of the new series, containing 801 pages, 20 maps, and 5 pictorial illustrations and sections. A second part of the 'Supplementary Papers' is in hand, and will be published, it is

hoped, before the end of the present session. The new edition (fifth) of the 'Hints to Travellers,' edited by Lieut.-Col. Godwin-Austen, Mr. J. K. Laughton, M.A., and Mr. Douglas Freshfield, was published in May last.

The total cost of the Monthly 'Proceedings' for 1883 was 1863*l.* 19*s.* 3*d.*, including printing, 1101*l.* 3*s.* 10*d.*; maps and illustrations, 501*l.* 2*s.* 10*d.*; and free delivery to Fellows, 261*l.* 12*s.* 7*d.* Against this is to be set the amount received from sales to the public, 540*l.* 10*s.* 6*d.*,* and from advertisements (*net*), 293*l.* 18*s.* 8*d.*

Of the 'Hints to Travellers' 1000 copies were printed, at a cost (including payments to contributors) of 336*l.* 14*s.* 5*d.*; up to the present date 33*l.* 18*s.* 9*d.* have been received from sales.

The third and concluding Part of the Society's large Map of Eastern Equatorial Africa has been published during the year.

Scientific Purposes Grant.—With the view of rendering the work more complete the Scientific Purposes Committee have requested Mr. Ravenstein to undertake the western half of the same zone of the continent. The Map is to be drawn and lithographed in the same style as the eastern half, but printed on stronger paper. The Bibliography of African travel and geography, compiled by Mr. Ravenstein, will be published with this second portion of the Map.

During the past year twenty intending travellers have received instruction under Mr. Coles, in Practical Astronomy in the Society's Observatory, and in route-surveying in the country, this number being in excess of any previous year. The gentlemen who have been instructed have proceeded, or are about to proceed, to the following destinations:—Borneo, Burmah, India, Mt. Kilimanjaro, Lake Region of Central Africa, East and West Africa, and Patagonia.

Seven pupils are at present under instruction, and the total number of hours devoted to teaching during the year was 481.

The Council have decided to withdraw the medals offered since 1869 to the Public Schools for Physical and Political Geography, and the examination that has been held during this session will therefore be the last under the present system. Before taking any further steps in the interest of geographical education they have thought it expedient to obtain official information as to geographical instruction on the Continent, and have therefore resolved to appoint a Geographical Inspector for a limited period, at a cost of 250*l.*, whose duty it will be to visit the principal European capitals, collect such books, maps, diagrams, and appliances as may seem worthy of notice, and report generally to the Society on the place of geography in Continental education.

Expeditions, Grants of Instruments to Travellers.—A sum of 1449*l.* 13*s.* 2*d.* has been expended in payments in respect of the expedition to East Africa under Mr. J. Thomson, who is still in that country, and to whose return the Council look forward with great interest. A sum of 200*l.* was granted towards Consul O'Neill's expenses in his journeys into the interior of South-eastern Africa.

Instruments to the value of 412*l.* 4*s.* 6*d.* have been lent during the past year to the following travellers:—Mr. W. Deans Cowan, Madagascar, 31*l.* 5*s.*; Commander C. E. Gissing, R.N., East Africa, 65*l.* 8*s.*; Capt. C. E. Foot, R.N., East Africa, 58*l.* 2*s.* 6*d.*; Mr. A. R. Colquhoun, Burmah, 53*l.* 10*s.*; Mr. W. O. McEwan, C.E., Lake Region, Africa, 27*l.* 10*s.*; Mr. H. H. Johnston, East Africa (Mt. Kilimanjaro), 122*l.* 9*s.*; Lieut. J. G. Haggard, R.N., East Africa, 54*l.*

The Instruments lent to Mr. Henry Forbes (Asiatic Archipelago), in 1878, Commander M. Drummond, R.N. (Borneo), 1880, and Capt. H. P. Dawson, R.A. (Circumpolar Expedition), 1882, have been returned.

* This includes 178*l.* 7*s.* 1*d.* properly belonging to the preceding volume.

Library.—711 books and pamphlets have been added during the past year (being 82 more than in the year before); 611 by donation or exchange, and 99 by purchase. The notices of new books in the 'Proceedings' continue to attract presentations by publishers and authors, thus diminishing expenditure.

105 pamphlets and small works have been put in covers by the Society's map-mounter, and 291 volumes have been bound.

The sum of 96*l.* 12*s.* 9*d.* has been expended in purchasing books, and the further sum of 72*l.* 5*s.* 3*d.* in binding for the Library.

Among the more important accessions are:—The Reports of the Scientific Results of the Voyage of the *Challenger*, 9 vols., with illustrations (the Lords of the Treasury); a complete series of Hertlet's 'Collection of Treaties'; Harkwell's translation of Pigafetta's Congo, 1597 (Mr. E. Whymper); Harris's 'Animals of Southern Africa'; continuations of the General Report of the Surveys of India, the Trigonometrical Survey and Synopsis, the Archæological Survey of Western India, Atkinson's Gazetteer of the North-West Provinces, and Max Müller's 'Sacred Books of the East,' with McIver's Census of Madras, Ibbetson's Pánjáb Census, the General Census of the Indian Empire, and Meteorological Observations (H.M. Secretary of State for India); continuations of the Memoirs and Records of the Geological Survey of India (the Indian Government,) the publications of the Intelligence Department of the War Office, and of the Hydrographic and Meteorological Offices, with various Reports of geographical interest from H.M. Foreign Office, including Guzman's 'Salvador'; all the year's Parliamentary Papers of geographical interest (Lord Arthur Russell); the year's Reports and Publications of the Engineer Department, Bureau of Navigation, Coast and Geodetic Survey, and Signal Officer, United States of America; a set of the New York State Survey Reports, 1877-1883 (Mr. Horace Andrews, jun.); the continuation of Powell's and Hayden's Geological Survey Reports, with valuable supplementary volumes by Dutton and Williams, and vols. I. and IV., with Atlas, of the Geological Survey of Wisconsin; vols. XVIII. and XIX., and IV., VII., and IX. of the second series, of the Publications de l'École des Langues Orientales Vivantes (the French Minister of Public Instruction), and various publications of the Dépôt des Cartes et Plans de la Marine, the Chilian Hydrographic Office, the New Zealand Colonial Museum and Geological Survey Department, the Chinese Imperial Maritime Customs, and the Victoria and Queensland Governments; continuations of the Scientific Results of the *Vega* Voyage (Baron Nordenskjöld), the Hakluyt Society's Publications, the Norwegian North Atlantic Expedition (Prof. Mohn), St. Martin's 'Nouveau Dictionnaire de Géographie Universelle,' Reclus's 'Géographie Universelle' (Author), Ritter's 'Geographisches Lexikon,' Gen. Roca's Report of the Rio Negro Expedition (Cordoba Acad. of Sciences), and Cordier's 'Bibliotheca Sinica'; the new editions to date of Murray's and Bædeker's Guide Books; St. Martin's 'Histoire de Géographie,' with Atlas; Meinicke's 'Inseln des Stillen Ocean's'; Piassetsky's 'Voyage à travers la Mongolie'; Rein's Japan; vols. III. and IV. of Schefer and Cordier's 'Recueil des Voyages'; Ainslie and Mayer's 'Caramania'; Lefroy's 'Diary of Magnetic Survey' (Author); Cust's 'Languages of Africa' (Author); Petitot's Dictionnaire des 'Langues Dènè-Dindjè'; Peralta's 'Costa Rica' (Author); Colquhoun's 'Across Chrysè' (Author); Prejevalsky's Third Journey to Central Asia (Author); various works and treatises on New Zealand (Mr. C. E. Peek); the completion, by Guyard, of Aboulféda's Geography; Ruge's 'Geschichte des Zeitalters der Entdeckungen'; James's 'Wild Tribes of the Soudan' (Author); Lortet's 'La Syrie d'aujourd'hui' (MM. Hachette); and the series of descriptive catalogues of the Dutch Colonies at the Amsterdam Exhibition, 1883 (Prof. Veth).

Much valuable aid in bibliographical matters, and in the presentation of useful

desiderata, has been extended to the Library during the past year by Mr. James Jackson, the Hon. Librarian of the Société de Géographie.

The Library continues to be consulted by students introduced by Fellows, and (perhaps to a larger extent than before) by general inquirers, usually attracted by the references to new books in the 'Proceedings.'

Map Room.—The accessions to the Map-Room Collection during the past year comprise 1110 Maps and Charts on 1717 sheets; 16 Atlases, containing 506 sheets of Maps; 88 Photographs and Views; and 1 Portrait. Of these, 45 Maps on 238 sheets, and 9 Atlases on 305 sheets, have been purchased.

The accessions are in excess of those of the previous year by 13 Maps on 31 sheets, and 13 Atlases.

Amongst the most important donations to the Map-Room Collection are:—367 sheets of the Ordnance Survey of the British Isles (presented by the First Commissioner of Public Works, through the Director-General of the Ordnance Survey); 162 Charts of the British Admiralty (The Lords Commissioners of the Admiralty, through the Hydrographer); 183 sheets of the various Indian Government Surveys (H.M. Secretary of State for India); 6 sheets of Maps of Egyptian Soudan, &c. (Intelligence Branch of the Quartermaster-General's Department); 20 French Charts (Dépôt des Cartes et Plans de la Marine); 11 United States Charts (Commander J. R. Bartlett, U.S.N., Hydrographer to the Bureau of Navigation); 197 Maps and Plans on 294 sheets, of Australia, New Zealand, and Tasmania (Surveyors-General of the various Colonies and others, through C. E. Peek, Esq.); Anthropological Collection of Photographs, Asiatic and American, 65 in number (Prince Roland Bonaparte); 14 Maps, published in Petermann's 'Geographische Mitteilungen' (the Editors); 10 Maps of parts of the Dominion of Canada, N.W. Territory, Manitoba, &c. (Lindsay Russell, Esq., Surveyor-General); 20 Maps, on 62 sheets, published by Dietrich Reimer, Berlin (the Publisher); Parts XXI, XXII, and XXIII, containing 36 Maps, of the Topographischer Atlas der Schweiz (Chief of the Federal Survey, Berne); Bacon's Atlas of the British Isles (G. W. Bacon, Esq.).

The Maps in the Society's Collection have been made frequent use of by the Fellows of the Society, public officers, and the general public. The large Maps and Views have been lent for the purpose of illustrating lectures at public institutions, as well as to private individuals. Thirteen new diagraphs have been constructed on the premises.

The adoption of the Report was moved by Major-General Sir LEWIS PELLY, K.C.B., and seconded by Major-General J. BAILLIE, and the resolution on being put to the vote was carried unanimously.

PRESENTATION OF THE ROYAL MEDALS.

The Royal Medals for the Encouragement of Geographical Science and Discovery had been awarded by the Council this year as follows:—

The Founder's Medal to Mr. A. R. COLQUHOUN for his journey from Canton to the Irawadi at Bhamo, in 1882, during which he executed surveys of the whole route from Wu-chau (150 miles west of Canton) to Talifu, 1300 miles of which had never before been surveyed.

The Patron's or Victoria Medal to Dr. JULIUS HAAST, in consideration of his systematic explorations of the Southern Island of New Zealand, in the course of which he ascertained the altitudes of 130 stations, and collected material for a map on the scale of 4 miles to an inch, the MS. of which he presented to the Royal Geographical Society. Also for his numerous contributions to our knowledge of New Zealand, contained in the Society's publications and elsewhere.

In the absence of the medallists, Lieut.-General Sir ARTHUR PHAYRE attended to receive the medal on behalf of Mr. Colquhoun, and Sir F. D. BELL, K.C.M.G., Agent-General for the Colony of New Zealand, performed the same office for Dr. von Haast.

The PRESIDENT, in presenting the Founder's Medal, said :—

The Council of the Society have unanimously awarded the Founder's Medal of the year to Mr. Archibald R. Colquhoun, in recognition of the great geographical value of the route-survey which he carried through Southern China in 1882, from Canton to Bhamó on the Irawadi. Mr. Colquhoun had long contemplated and prepared himself for this great undertaking, having, whilst fulfilling his duties as Engineer in the Public Works Department of India, learnt to appreciate the practical as well as the scientific importance of a better knowledge of these frontier districts, and he eventually executed this cherished purpose with his own private means. The personal narrative of his lengthened journey he published in a popular form in 1883, under the title of 'Across Chryssè'; but the details of his survey he deposited with the Society, when he started on his second expedition to the same region, undertaken with the object of reaching Northern Siam, and exploring the nearest route thence to the Bay of Bengal. This survey, kept up, as shown by his field-books, over every step of his journey, opened up 1300 miles of route never before explored, and has enabled our draughtsman to construct a map which will be published in one of the supplementary numbers of our 'Proceedings.' As Colonel Yule stated to your Council, in urging this enterprising traveller's claims, "Mr. Colquhoun's journey was the best that has yet been made from sea to sea across Farther India in or near the latitude of Canton." Mr. Colquhoun's youth, energy and enthusiastic devotion to geographical exploration, give us fair reason for believing that it will not be long before he adds new titles to our admiration and gratitude.

Sir A. PHAYRE, in acknowledging the receipt of the Medal, said the good work that Mr. Colquhoun had accomplished was so well known, and his high merit was so conspicuous, that it was quite unnecessary for him to say anything with regard to his services to geographical science. It was not the first time that one of Mr. Colquhoun's family had received this high honour from the Society. In 1866 his kinsman, Dr. Thomson, was rewarded with the Gold Medal for his researches in the Western Himalayas and Tibet. Mr. Colquhoun was at present in the Far East, where his energy and enterprise as a traveller would again be made manifest, and no doubt he would consider it his first duty to make known the results of his explorations to the Royal Geographical Society. He (Sir A. Phayre) would send the medal to Mr. Colquhoun's father, who was deeply grateful for the high honour conferred upon his son, though he was unable to attend on this interesting occasion.

In presenting the Patron's Medal, the President spoke as follows :—

The Royal Medals are given for the promotion of "discovery and science." Some of their recipients leap into fame by one bold feat of discovery; others become known to us by lives devoted to the promotion of a scientific knowledge of the earth's surface. Dr. von Haast might have received our medal worthily, and it was, I am informed, in the mind of our late President, Sir Roderick Murchison, to propose him for the honour many years ago, in acknowledgment of his performances as a bold and enterprising discoverer. He has since established a still higher claim for it in a capacity which we delight to honour, that of a steady scientific worker.

Dr. Von Haast was appointed Government Geologist of the Province of Canterbury about the year 1860, when he at once commenced the series of explorations which have been the foundation of that great work, his map of the Southern Alps. Explorations in the interior of New Zealand, among its mountain recesses and precipitous glaciers, still, as you lately heard from Mr. Green, involve the endurance of many hardships. A quarter of a century ago they were not made without great peril.

Of Von Haast's companions, three, Dr. Sinclair, Messrs. Whitcomb and Hewitt, were drowned; and one, Mr. Dobson, was murdered by natives. From March 7th to the 21st, 1860, while exploring the country drained by the Grey river, Von Haast's companions were so reduced by starvation that they were unable to proceed, and the whole party ran extreme risk of being lost. Under these circumstances, the qualities which led Dr. Sinclair to write of him as "the jolly and joyous Haast," must have stood him in good stead. The object of this expedition was to pioneer a road across the island, and in this it was successful, as a road has been made on the line then indicated. The journey was also of importance in leading to the discovery and survey of coalfields which have since been worked by the Colony to its great advantage.

This was perhaps the most arduous of his explorations, though other journeys in Canterbury and Westland covered a wider field. These are thus alluded to by Hochstetter in his work 'New Zealand,' published in 1867:—

"Foremost amongst the Alpine explorers stands the name of my energetic friend Dr. Haast, who, as Government Geologist for the Province of Canterbury, in 1861 penetrated to the sources of the Rangitata; in 1862 undertook the task of exploring the head-waters of the Waitaki, in the neighbourhood of Mount Cook, and in the last years has repeatedly crossed the dividing range to the West Coast. His animated descriptions and interesting communications form the main part of this chapter, and we shall follow his footsteps into the very heart of the Alps."

After some ten years of travel Dr. von Haast collected the result of his observations in a great map of the Southern Alps on a scale of four miles to the inch, one manuscript copy of which is deposited at Christchurch, while another was sent home and reproduced by our own Society, on a reduced scale, in the 40th volume of the Journal.

This map contained the altitudes of 130 stations determined by Von Haast, besides laying down with singular accuracy the main features of a most complicated ice-clad range. It is still the main authority, and into it the detailed work of recent glacier explorers, such as Green and Von Lendenfeld, has to be fitted.

Besides this map Von Haast has also aided in the perfection of other provincial maps, and has from time to time given to the world the result of his labours as a geographer, a geologist, and a naturalist, in at least twenty different communications, some of them made to our own Society, and extending to 1874.

Dr. Von Haast is now Professor of Geology and Palæontology in Canterbury College, and Curator of the Christchurch Museum, has been from time to time President of most of the scientific Societies in the Colony, and shares with his distinguished colleague, Dr. Hector, the leadership in all its scientific activity.

In honouring him, we are also, we hope, encouraging through these Societies a Colony that has distinguished itself by its enlightened policy towards education and science. We feel an especial pleasure in adding to the number of our already numerous Australasian Medallists, by sending a medal for the first time to New Zealand, and conferring it on one who, by birth and education an Austrian, has made that beautiful and interesting colony the country of his adoption, and the theatre of such long, arduous, and well-directed scientific labours.

Sir F. D. BELL (formerly Speaker of the House of Assembly, New Zealand), on receiving the medal for Dr. Haast, said that it was true, as stated by the noble Chairman, that the Colony he represented had endeavoured to distinguish itself by liberal aids to science and learning, and it was only natural that in a country possessing physical features of such varied interest as New Zealand a great many of the colonists should make explorations and give to the world at large the information which they had collected. In transmitting the medal to Dr. Haast he should be able to assure him that it had been granted under conditions which were highly honourable to him.

THE AWARD OF THE MURCHISON, BACK, AND CUTHBERT PEEK GRANTS.

The PRESIDENT next announced that the Council had this year awarded the above grants as follows:—The MURCHISON GRANT to Mr. W. W. McNAIR, for his adventurous journey from Peshawar to Kafiristan and his return journey by Chitral and Gilgit to India, during which he acquired much new geographical information regarding the passes of the Hindu Kush, and especially regarding the Siyah Push Kafirs, into whose country no European had ever before penetrated.

The BACK GRANT to EMIL BOSS, for having accompanied, without remuneration, the Rev. W. S. Green to New Zealand, and taken the leading part in the first ascent of Mount Cook and exploration of the upper basin of the Great Tasman Glacier; and also for having in the Himalayas, with Mr. W. W. Graham, made extensive journeys of exploration in the Kinchinjanga and Nanda Devi groups, and reached a height of 24,000 feet—1700 feet higher than any previously recorded to have been attained; and further as an encouragement to Alpine guides to join parties of exploration in mountainous districts, where their experience and hardihood have been found to be of great value.

The CUTHBERT PEEK GRANT to Mr. W. O. McEWAN in testimony of the zeal and ability he has shown in qualifying himself under the Society's Instructor as a geographer and astronomical observer prior to departing for Central Africa, where he is to succeed the late Mr. James Stewart, as engineer of the road under construction between Lakes Nyassa and Tanganyika.

The three Honorary Corresponding Memberships for 1884 had been voted to M. Ferdinand de Lesseps, Dr. Julius von Haast, and Dr. Max Buchner.

PRESENTATION OF THE PUBLIC SCHOOLS' PRIZE MEDALS.*

The Medals had been awarded as follows by the Examiners, who were, for PHYSICAL GEOGRAPHY, Professor H. N. Moseley, M.A., F.R.S., and for POLITICAL GEOGRAPHY, Sir Richard Temple, Bart., G.C.S.I., C.I.E., the special subject for the year being India (excluding British Burmah).

PHYSICAL GEOGRAPHY.—*Gold Medal*—Samuel William Carruthers, Dulwich College. *Silver Medal*—Not awarded. *Honourably Mentioned*—Stanley Daws Dewey, Dulwich College; Percy Blackburn, London International College; George Seymour Curtis, Marlborough College; Furman Hunt McGrath, London International College.

POLITICAL GEOGRAPHY.—*Gold Medal*—Sylvester Arthur Fox, Dulwich College. *Silver Medal*—Edward Basil Nicholson, City of London School. *Honourably mentioned*—The Hon. Charles Granville Bruce, Repton School; Jens Henrik Raundrup, Manchester Grammar School.

Sir R. TEMPLE, in introducing the young Medallists, said, the results of the examination in Political Geography were on the whole satisfactory and encouraging. Ten public schools had competed, and 17 young men were competitors. The papers

* The other medals, for the promotion of Geographical Education, placed by the Society at the disposal of the syndicates respectively of the Oxford and Cambridge Local Examinations, were awarded as follows:—

1883. Oxford (June).—*Silver Medal*—Frederick Wynne Lloyd, Liverpool. *Bronze Medal*—Edith Emily Tylee, London.

Cambridge (December).—*Silver Medal*—(Physical Geography)—Gertrude Frances Crosby, Scarborough. *Silver Medal*—(Political Geography)—Sidney Albert Playne, Liskeard.

however, showed that there was great need of an independent test being applied to geographical instruction throughout the country, for although the general instruction was evidently carefully supplied, it was not of a sufficiently practical character. Not one of the competitors could describe the straight road from London to Jerusalem, nor could any of them state fully the various administrative divisions of the Indian Empire. Long lists were given of districts and provinces, but these were mixed up together, and names were also given of native states which no longer existed. He unfeignedly regretted that this was the last examination under the old system, but he rejoiced to know that after inquiries had been made as to geographical instruction on the Continent, the system would be continued on a more scientific basis. It was in his opinion important that there should be no break in the continuity. If any delay was likely to occur in introducing the modified system he would recommend that the old plan should be followed until the new one was ready. It would have a very discouraging effect upon the public schools if there was any interruption in the Society's exertions in the cause of geographical education. Arnold, who was not only a great schoolmaster, but also a great historian, said that a man could not be a competent historian unless he was first a competent geographer. Geography was the handmaid of several physical sciences, and a knowledge of political geography was essential to every Briton, for without it it was impossible to understand the policies relating to a world-wide empire.

The PRESIDENT then read the Annual Address on the Progress of Geography. On the conclusion of the Address, General R. STRACHEY proposed a vote of thanks to the President for his admirable address which showed that there still remained ample scope for the exertions of explorers, and an ample supply of explorers to carry out the investigations.

General Sir H. L. THULLIER seconded the motion, which was agreed to.

The PRESIDENT, in acknowledging the vote, said that for most of what was interesting in the Address he was indebted to the assistance of the able officers of the Society. It was a sort of work that required the co-operation of many heads. It was to the hearty co-operation of the Council and officers that the great success of the Society was due, and the high estimation in which it was held throughout the world.

The Ballot for the new Council then took place, after which Sir JAS. ALEXANDER announced the result, viz. that the list as recommended by the Council had been unanimously elected. The list is as follows (the names printed in *italics* being New Members, or those who change office):—

President: Right Hon. Lord Aberdare, F.R.S. *Vice-Presidents*: Francis Galton, Esq., F.R.S.; Sir Barrow H. Ellis, K.C.S.I.; Right Hon. Sir H. Bartle E. Frere, Bart., G.C.B.; General Sir J. H. Lefroy, B.A., K.C.M.G.; *Major-General Sir H. C. Rawlinson*, K.C.B.; *General R. Strachey*, C.S.I., F.R.S. *Treasurer*: Reginald T. Cocks, Esq. *Trustees*: Lord Houghton, D.C.L.; Sir John Lubbock, Bart., F.R.S. *Secretaries*: Clements R. Markham, Esq.; C.B., F.R.S.; Douglas W. Freshfield, Esq. *Foreign Secretary*: Lord Arthur Russell, M.P. *Members of Council*: *Sir Rutherford Alcock*, K.C.B.; *W. T. Blanford*, Esq., F.R.S.; E. H. Bunbury, Esq.; Colonel J. U. Bateman Champain, B.E.; Major-General A. C. Cooke, B.E.; R. N. Cust, Esq.; *Major-General Sir F. J. Goldsmid*, K.C.S.I., C.B.; Colonel J. A. Grant, C.B., C.S.I., F.R.S.; *W. Mackinnon*, Esq. C.I.E.; *Admiral Sir F. L. McClintock*, F.R.S.; *R. H. Major*, Esq., F.S.A.; Rear-Admiral R. C. Mayne, C.B.; *Cuthbert E. Peek*, Esq., F.R.A.S.; Sir Rawson Rawson, K.C.M.G.; Major-General C. P. Rigby; *S. W. Silver*, Esq.; General Sir C. P. Beauchamp Walker, K.C.B.; *Lieut-Colonel Sir C. Warren*, B.E., F.R.S.; *Capt. W. J. L. Wharton*, R.N.; Sir Allen Young, C.B.; Colonel Henry Yule, C.B. The proceedings then terminated.

THE ANNIVERSARY DINNER.

The usual Annual Dinner of Fellows and their friends took place in the evening of the same day, at Willis's Rooms, St. James's; LORD ABERDARE, President, in the Chair. Among the guests and Fellows present on the occasion were the following:—Prince G. Cantacuzène (Russian Chargé d'Affaires), Don Marcial Martinez (Chilian Minister), General Schindler, Colonel Strauch (President of the International African Association, Brussels), Commander Chadwick and Lieutenant Ray (U.S. Navy), Lord Bramwell, Lord Houghton, Sir Robert G. W. Herbert, K.C.B., Hon. A. Evelyn Ashley, M.P., Sir Richard Temple, Bart., Sir Joseph Hooker, Sir Arthur Phayre, Admiral Sir A. Hoskins, Admiral Sir W. Mends, Sir W. Gregory, Admiral Sir F. W. Richards, Sir T. Fowell Buxton, General Sir H. Lefroy, Sir F. D. Bell, Sir U. Kay Shuttleworth, Sir F. Goldsmid, Mr. W. McNair, &c.

The toasts were:—1. "Her Majesty the Queen, Patron of the Society"; 2. "The Prince of Wales, Vice-Patron, The Duke of Edinburgh, Honorary President, and the other Members of the Royal Family"—both proposed by the President; 3. "The Medallists of the year." The PRESIDENT, in proposing the toast, said that in performing the duty of selection the Council had a difficult task to discharge, for there were worthy competitors from many countries. The Germans, the Russians, the Italians were each represented by distinguished travellers, and but for an accident there would have been another competitor—a French traveller, M. Giraud, whose bold attempt to descend the stream supposed to be the Upper Congo had been referred to in the proceedings of the morning. Touching upon the strong claims to the distinction of those selected, the President said that while they did not know exactly how far Mr. Colquhoun had travelled where possibly the footsteps of the missionary might have preceded him, though no one had previously described the country, careful examination showed that he had traversed for 1300 miles a road full of difficulties and dangers, of which nothing had been hitherto recorded by any European. Their other medallist, Dr. Von Haast, had been selected for other but equally valid reasons. Sir F. D. BELL acknowledged the compliment the Society had paid his fellow colonist.

4. "Our Guests." Lord HOUGHTON, who had charge of this toast, said in his capacity of a Trustee of the Society, and therefore the formal owner of all their wealth, he proposed "The Health of the Illustrious Guests." This Society, if any, had the right to be hospitable; they were the entertainers of the world, and they were entertained by the world. Wherever they went they were received with open arms and with congratulations on their efforts, which they reciprocated to their hosts all over the world. His only difficulty lay in the multitude before him, and he alluded in turn to the Chilian Minister, a representative of one of those great South American Republics of which Mr. Canning welcomed the birth as restoring the balance of freedom in the universe; to the representative from the Russian Embassy of that great country which still in its immensity opened to us large fields of investigation, and which received our travellers with such hospitality and friendliness as enabled Mr. Wallace to give us a picture of the life, the habits, and the condition of a foreign nation such as had rarely been presented to a geographical community; and to one who was present among them to represent one of the greatest problems of modern times, so interesting in the realisation of the recent discoveries in Africa, placing as it did those who had undertaken to solve it in a commercial and even diplomatic position, which offered complications to which they could only hope that the solution might be of the happiest. But he should ask to be allowed to propose, in connection with this toast, Commander Chadwick, of the American Navy, who was connected at the present moment with the United States Legation in London, to whom the *Alert*, the gift of the English Government to the American people for

the rescue of the lost Arctic discoverers, had been intrusted. He would not undertake to say what were the boundaries of America; on the north, the North Pole; on the west, the Pacific; on the east, the Atlantic; and to the south, just as far as they chose to go; but whatever might be said of the other boundaries, there was no doubt about that presented in the direction of the North Pole. And this was a matter in which we had a great and common interest. We took not only a geographer's interest in this, but the interest in the great and brave men we had sent there to dare and die, and one of his dear and respected friends, Franklin, had at least this satisfaction—that he had the only respectable statue in the metropolis. The other gentleman whom he should ask to return thanks for this toast was Mr. Evelyn Ashley, the representative of the Colonial Office present. Expressing his sense of the advantage of the relations subsisting between the Geographical Society and the Colonies, his lordship concluded by a pleasant reference to the connection of his friend with the Isle of Wight, of which mysterious island his friend was the Parliamentary representative.—Commander CHADWICK, in reply, gave expression to the kindly and grateful feelings which the interest shown by our Government in the fate of Lieutenant Greely's Arctic Expedition had called forth in the United States.—Mr. EVELYN ASHLEY, M.P., having spoken of the importance of the objects pursued by this Society in pushing investigation into all parts of the world and opening up new fields of enterprise and channels of commerce, said that most Englishmen had a taste for geographical knowledge, which was not so generally shared by our friends over the water. There was an old story which, of course, was not true, but which was told with great gusto, of his old chief, Lord Palmerston, that having temporarily to administer the affairs of the Colonial Office, he said, pulling down the map from the wall, "Let's have this map down and see where all these places are." Whether, however, the mass of our people had or had not in the past been ignorant of the resources of our Colonies, he ventured to say that now in all parts of the country a most keen interest was taken in, and he might almost say an accurate knowledge shown of the affairs of our great Colonial Empire. That feeling ought to be encouraged, and he believed that great encouragement was given to that feeling by the proceedings of the Geographical Society.

5. The last toast was "Our President," proposed by Major-General Sir J. H. LEFROY, to which Lord Aberdare briefly replied, and the company soon after separated.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—June 6th, 1884: M. BOUQUET DE LA GRÈVE, of the Institute, in the Chair.—The Minister of Public Works forwarded to the Society the Report, which had just been published by his department, on the two expeditions made in the South of Algeria under the command of Lieut.-Colonel Flatters.—M. Suzanne, publisher, a member of the Society, presented the physical map of France, scale 1:800,000, which he had just published. It was stated that the authors of the map, MM. Guillemin and Paquier, were also members of the Society, and that the conformation of the ground was shown in the map in an entirely new way.—News was received of MM. Maurel and La Martinière, who started some time ago for a journey to Morocco, in a letter dated May 12th, from Iserisera, in the territory of the Sherif, at a distance of three hours' march from Uezzan. They had paid a visit to the sons of the Sherif, who had given them a very cordial reception, but the travellers had found them much agitated at the

news of the entry of 200 of the Sultan's cavalry into their territory. The diplomatic difficulties which existed at the present time between France and Morocco would, it was stated, prevent MM. Maurel and La Martinière for the present from advancing further into the South.—M. Virlet d'Aoust stated that the Geographical Union of the North of France, which numbered twelve or thirteen societies, had just been increased (as already announced) by a new accession, viz. the society formed at Avesnes (Department du Nord), and he made some remarks upon the commencement of this society. In addition to the society just mentioned the General Secretary announced that a Society for Commercial Geography had just been established at Havre. The importance of that seaport had for a long time past rendered it desirable that such a society should be formed, and it was the more necessary since Rouen, the rival of Havre, had possessed for a long period an important society, viz. the Geographical Society of Normandy.—M. H. P. Moreno, Director of the Ethnographical Museum at Buenos-Ayres, wrote on May 2nd, from Iglesia, in the province of San Juan, and described the journey he had undertaken with the intention of studying the anthropology and archæology of the Argentine provinces of the North as well as Bolivia, pushing on as far as Cuzco. This journey was commenced on 7th of December, 1882. At Cordova, where he had intended to stay for three days only, he remained four months, studying not only the inhabitants of the towns but also those of the country around, and exploring the woods and mountains. He then traversed the district which is situated on the west of the province of Cordova and on the east of that of San Luis. From Cordova he proceeded to Mendoza, where he stayed for seven months and made great additions to his collections. The traveller afterwards entered the province of San Juan, and had been there two months at the time of writing, having made many archæological researches. The transfer of the Museum to the new capital, La Plata, would compel M. Moreno to suspend his journey for a time, but he hoped to take it up again as soon as his installation was effected.—A communication was read from M. d'Abbadie, of the Institute, in which, *à propos* of a map just published in Italy showing the recent explorations made by travellers of that nation, he discussed the question of the orthography of geographical names. He stated in the paper that this spelling (unskillfully formed from the Latin language, of which certain sounds had not been preserved by tradition) varied in all the languages of Western Europe. Instead of inventing characters for the sounds which were wanting, or at least presumably wanting, in Latin, men had preferred to express them by combinations of letters. The English, at least, had had the good sense to invent their "w." This wise example had been followed by the Russians, who employed a distinct letter for each separate sound in their language.—M. Brau de St. Pol Lias presented several works, and among others a report by Dr. Bordes-Pagès on the piercing of the Central Pyrenees. A Commission of French and Spanish delegates was at that moment sitting at Paris to deal with this question. The author indicated Port de Salan, which was reached by way of Toulouse, St. Girons, and Sève, as being the most favourable point for this tunnel. Napoleon I., in a decree of the year 1813, when organising the general system of French roads, considered this pass as the best between Toulouse and the Spanish province of Arragon. M. de St. Pol Lias then referred to the recent visit to Paris of Sir Hugh Low, Commander of the Order of St. Michael and St. George, and British Resident in Perak (Malay Peninsula). Sir Hugh Low's visit to Paris had been noticed with great courtesy by the French press, and especially in an article in the paper *La France* (May 18th, 1884) signed "Lucien Nicol." Sir H. Low, said the speaker, who was to be affiliated to their Society, held a recognized position among them as a pioneer and as a man of science. The services which he had rendered to colonisa-

tion and to science had earned for him this title, not less than the reception he had always given and the generous support which he had not ceased to lend to French travellers in the countries administered by him.—M. J. B. Paquier, Professor of Geography and History at the School of St. Louis at Paris, expressed his opinions regarding the scheme of one of his colleagues, Professor Ludovic Drapeyron, editor of the 'Revue de Geographie,' concerning the establishment of a National School of Geography. M. Drapeyron had explained his project before the Topographical Society of France, of which he is the Secretary. According to his plan this school would comprise thirteen professorships, divided into four sections: (i.) technical, (ii.) scientific, (iii.) economic, (iv.) historical and political. M. Paquier entirely approved of M. Drapeyron's project, for he desired to see France assume again the place she had formerly occupied in geographical science and also in cartography, a branch in which she had allowed herself to be surpassed by Germany and England. He thought that a college of this kind would be able to educate geographers, topographers and cartographers. He would extend the idea of M. Drapeyron, and in place of a school he would propose a National Institute of Geography, in which would be educated professors of geography for first and second grade teaching (1st or pedagogical section), consuls, vice-consuls, agents abroad (2nd or political section), explorers, travellers, traders (3rd or colonizing section), cartographers, engravers, &c. (4th or technical section, as in the Drapeyron project).—In conclusion, Dr. Hyades, member of the French Mission recently returned from Cape Horn, which was charged in connection with this expedition to make researches bearing upon the various branches of natural history, made a communication, in which he instituted comparisons between the ancient and modern documents of the language of the Fuegians of this region. The study to which M. Hyades applied himself had special reference to the "Tekeenika" Fuegians of FitzRoy or the "Yaghan" of the present English missionaries. These Fuegians, who, it appears, are found from the neighbourhood of Cape Horn on the south to the centre of the Beagle Passage, are very distinct from the Alikhoolip, now called Alakalouf, who dwell in the Eastern part of the Fuegian Archipelago. Dr. Hyades explained the linguistic errors into which FitzRoy fell. He paid an honourable tribute to the works of the present superintendent of the English Protestant mission, the Rev. Mr. Bridges, who for twenty years had studied on the spot the Fuegian language and had not ceased to register all its words. This language only possessed some 30,000 words, which were sufficient before the arrival of Europeans, but now inadequate to express the new relations with the missionaries. Mr. Bridges had collected the materials for a grammar and also for a large dictionary, which he had already revised twenty times. He was then busily engaged upon the publication of a translation of the Gospel of St. Luke. The influence of the missionaries had penetrated into all parts of the country of Tierra del Fuego inhabited by the Yaghan, and the favourable change which had come over them in their relations with foreigners since the voyages of FitzRoy and Darwin was due solely to the conduct of the missionaries and specially to that of Mr. Bridges.

NEW BOOKS.

(By E. C. RYE, *Librarian* R.G.S.)

EUROPE.

- Devereux, W. Cope.**—Fair Italy. The Riviera and Monte Carlo. Comprising a Tour through North and South Italy and Sicily, with a short account of Malta. London (Kegan Paul, Trench, & Co.): 1884, cr. 8vo., pp. xvi. and 346. Price 6s.
- Michow, [Dr.] H.**—Die ältesten Karten von Russland, ein Beitrag zur historischen Geographie. Hamburg (L. Friederichsen & Co.): 1884, 8vo., pp. 91, maps. (*Dulau*: price 3s. 9d.)

After a bibliographical sketch of ancient Russian Cartography, Dr. Michow shows that Heberstein's often copied and translated map of 1549 is not, as supposed by Peschel, Vivien de Saint-Martin, and others, the earliest one of Russia, as in addition to the sources of information acknowledged in his preface, there exists a prior map in Sebastian Münster's 'Kosmographie' of 1544. The map of Anton Wied of Danzig, usually accepted as dating from 1555, is from internal evidence and a strict comparison with Münster's presumably anterior publication, shown to have existed long before that date, and to have been the original from which Münster, Heberstein, and Ortelius respectively copied. Finally, the text of Paulus Jovius is reproduced, and the map promised but not appearing in any edition of it shown to exist in MS. by Battista Agnese, 1525, in the Library of St. Mark at Venice. This and the maps of Wied and Münster are reproduced (the two latter by photo-lithography).

ASIA.

- Bastian, A.**—Indonesien, oder die Inseln der Malayischen Archipel. I. Lieferung. Die Molukken. Reise-Ergebnisse und Studien. Berlin (F. Dümmler's Verlagsbuchhandlung): 1884, large 8vo., pp. xii. and 166, coloured plates. (*Dulau*: price 4s. 6d.)

This work is to be completed in two or three years, and to consist of some six parts like the above, discussing Celebes and Borneo, Timor, Rotti, Letti, Kisser, &c., Sumbawa to Bali, Java and Sumatra with dependencies. It discusses abstruse points of ethnological and linguistic interest, remote religious affinities, superstitions, dialects, &c.

- Bonvalot, Gabriel.**—En Asie Centrale. De Moscou en Bactriane. Paris (Plon): 1884, post 8vo., pp. 309, map and illustrations. (*Dulau*: price 4s.)

The author, accompanied by M. Capus, travelled (apparently to collect objects of natural history) in 1880, 1881, and 1882, through Russia, Western Siberia, Russian Turkistan, Bokhara, Khiva, and the Turcoman country, returning by Krasnovodsk and Baku. From Tachkent, he made a journey eastward to Andijar and Kokan, then working southwards to Karchi (with excursion up the valley of the Kashga-Darya), Chirrabad, and Kilif in the north bank of the Oxus. Much attention was devoted to the habits, customs, government, and general economy of the tribes; and a second volume is suggested. The map is from Burnaby's 'Ride to Khiva'; the illustrations are either from photographs, or characteristic sketches by M. Capus.

- Palestine Survey.**—The Survey of Western Palestine. Jerusalem. By Col. Sir Charles Warren, K.C.M.G., R.E., and Capt. Claude Regnier Conder, R.E. Published for the Committee of the Palestine Exploration Fund, 1, Adam Street, Adelphi, London, W.C.: 1884, 4to., pp. vii. and 542 [no Index], plans and illustrations.

This continuation of the 4to. publications of the Survey of Western Palestine (see R.G.S. 'Proceedings,' 1883, p. 304, for last preceding issue) contains a complete account of the authors' researches in Jerusalem, in the years 1867-

1870, with other discoveries by Col. Sir Chas. Wilson in 1865, and by Capt. Conder, M. Clermont Ganneau, Dr. Conrad, Hon. Conrad Schick, Herr Guthe, and others, since the departure of Sir C. Warren. The preface refers to an accompanying portfolio of drawings, plans, &c.

[**Palestine Survey.**]—The Survey of Western Palestine. The Fauna and Flora of Palestine. By H. B. Tristram, LL.D., D.D., F.R.S., Canon of Durham. Published by the Committee of the Palestine Exploration Fund, 1, Adam Street, Adelphi, London, W.C.: 1884, 4to., pp. xxii. and 455 [no Index], plates.

This volume contains a Catalogue of the known Vertebrates and Mollusca, and of the Flora of Palestine, a detailed examination of which discloses interesting results. An overwhelming majority of its species belong to the recognised zoological Palaearctic region, but there are in each class a group of exceptions and peculiar forms which cannot be referred to it, strictly confined to the area of the Jordan valley and Dead Sea basin, and appearing to bear a strong affinity to the Ethiopian region, with a trace of Indian admixture. These exceptions are considered to be only capable of satisfactory explanation by a reference to the geological history of the country, which shows that the glacial period though not extending in its intensity so far south, has left traces not yet wholly obliterated, while the preceding period of warmth has left yet larger proofs of its former northern extension in the unique tropical outlier of the Dead Sea basin, which is analogous both in its origin and in the present isolation of its various assemblages of life to the boreal outliers of our mountain tops and deep-sea bottoms,—the concave depression in the one case being the complement of the convex elevation in the other. The fluviatile fishes, which must be the very earliest living inhabitants of the Dead Sea, form a group far more distinct and divergent from those of the surrounding region than any other of the existing classes, and bearing a striking affinity to those found in the fresh-water lakes and rivers of Eastern Africa, even as far south as the Zambesi.

Piassetsky, P.—Russian Travellers in Mongolia and China. Translated by J. Gordon-Cumming. London (Chapman & Hall): 1884, 2 vols. cr. 8vo., pp. 321 and 315 [no index], illustrations. Price 24s.

This is not, as the title would wrongly imply, an account of the work done by Russian travellers in the regions named, but a simple translation of Piassetsky's account of Sosnofsky's 1874–75 expedition, of which the French original was noticed in our 'Proceedings' for the current year, p. 54.

AFRICA.

Grant, Charles Scovell.—West African Hygiene, or, Hints on the preservation of Health and the treatment of Tropical diseases, more especially on the West Coast of Africa. Second edition. Published for the Government of the Gold Coast Colony. London (Stanford): 1884, cr. 8vo., pp. 51.

Krause, Gottlob Adolf.—Mittheilungen der Riebeck'schen Niger-Expedition. I. Ein Beitrag zur Kenntniss der Fulischen Sprache in Afrika. Leipzig (Brockhaus): 1884, 8vo., pp. ii. and 108, map.

This sketch of the Fula dialect is the first contribution to the special publication for record of the expedition equipped by Dr. Emil Riebeck of Halle-on-Saale, with the object of the linguistic and ethnographic exploration of the Niger, Binué, and Tchad region.

Paulitschke [Dr.] Philipp.—Die geographische Erforschung der Adál-Länder und Harár's in Ost-Afrika. Mit Rücksicht auf die Expedition des Dr. Med. Dominik Kammel, Edlen von Hardegger. Leipzig (Frohberg): 1884, large 8vo., pp. 109.

A valuable monographic treatment of our knowledge of the Adál and Harár countries, preliminary to the journey in them with Dr. von Hardegger. The various ancient and modern authorities, travellers, and writers are separately discussed, and an excellent bibliography and list of maps is appended.

AMERICA.

[**Buenos-Ayres.**—Ministère de Gouvernement, Bureau de Statistique Générale. *Annuaire Statistique de la Province de Buenos-Ayres (République Argentine)*, publié sous la direction du Docteur Émile R. Coni, Directeur du Bureau de Statistique Générale. Deuxième Année, 1882. Edition en Français. Buenos-Ayres ("La República"): 1883, large 8vo., pp. lxxi. and 463, maps and plans.

After an introductory sketch of the territory, climate, population, administration, &c., of the Province, its situation, limits, superficies, the geographical position of its towns and villages, its general aspect and natural divisions, orography, hydrography, geological formations, fauna, flora, favourable and adverse natural conditions, territorial divisions, climate, and meteorology are discussed in some detail, before the usual statistical matter. The latter contains some references to medical climatology, agriculture, navigation, drainage areas, &c., more or less of a geographical nature. A slight essay towards a zoological bibliography is attempted (pp. 25-31).

The four maps (on a small scale) are physical, showing chief towns, villages, ports, &c., administrative districts, railways and other routes of communication, and telegraphs. A plan of the capital and its port, now in construction, is also given.

Friedrich, Karl.—*Die La Plata-Länder, unter besonderer Berücksichtigung ihrer wirthschaftlichen Verhältnisse, Viehzucht und Kolonisation, und ihrer Bedeutung für Deutsche Kapitalisten und Auswanderer.* Hamburg (L. Friederichsen & Co.): 1884, 8vo., pp. xii. and 170. (*Williams and Norgate*: price 4s.)

A descriptive account, with special view to German colonisation.

Pierrepoint, Edward.—*Fifth Avenue to Alaska.* With maps by Leonard Forbes Beckwith, c.e. New York & London (G. P. Putnam's Sons): 1884, cr. 8vo., pp. vi. and 329 [no index].

Details of a tour in 1883, of interest to any one contemplating a visit to the Pacific coast. The maps are of a rudimentary nature, covering well-known areas.

Zöller, Hugo.—*Pampas und Anden. Sitten- und Kultur-Schilderungen aus dem Spanischredenden Süd-Amerika, mit besonderer Berücksichtigung des Deutchthums.* Uruguay, Argentinien, Paraguay, Chile, Peru, Ecuador, Kolumbien. Berlin & Stuttgart (Spemann): 1884, cr. 8vo., pp. 409. (*Williams & Norgate*: price 10s.)

A more extended and æsthetic rendering of the motive of the above-mentioned volume by Friedrich, resulting from a year's travel, undertaken at the expense of the proprietors of the *Kölnische Zeitung*.

GENERAL.

Columbus.—*Christophe Colomb: son Origine, sa Vie, ses Voyages, sa Famille & ses Descendants.* D'après des documents inédits tirés des Archives de Gênes, de Savone, de Séville, et de Madrid. Études d'histoire critique, par Henry Harisse. Tome premier. Paris (Ernest Leroux): 1884, large 8vo., pp. xi. and 458, map, plan, and coloured frontispiece. *Williams & Norgate*: price 1l. 17s.

This forms vol. vi. of the 'Recueil de Voyages et de Documents pour servir à l'histoire de la Géographie depuis le XIII^e jusqu'à la fin du XVI^e Siècle,' under the direction of MM. Schefer and Cordier, of which the earlier publications have been from time to time noticed in the 'Proceedings.' It consists of an elaborate discussion of the manuscript and printed sources of information (many of which, as indicated in the title, have not before been utilised), the works of former chroniclers and historians of Columbus, the origin of his family (which appears from contemporary evidence to have been purely of the peasant or working class), his immediate ancestors, and his own life up to and including his first

voyage. With some slight preliminary reserve, M. HARRISSE adopts Capt. FOX'S hypothesis that the first actual landing on the Bahamas was at SAMANA (otherwise ATWOOD CAY).

The map is of the Bisagno district (near Genoa) with surrounding region, showing the country of COLUMBUS'S origin; and the plan represents the condition at the end of the 15th century of the upper part of the Faubourg St. Étienne, Genoa, in which were situated the houses of his family.

NEW MAPS.

(By J. COLES, *Map Ourator R.G.S.*)

EUROPE.

Alpes.—Carte du massif des—. Scale 1:80,000 or 1 geographical mile to an inch. Publié par le Dépôt de la Guerre, Paris. Sheets:—Aosta, Barjols, Brignoles, Cuers, Draguignan, Iles d'Hyères, Le Luc, Ronco, St. Tropez, Toulon, Tour de Camarat. Price 1s. 4d. (*Dulau.*)

Central-Europa.—Neue Uebersichtskarte von—, resp. der oesterreichisch-ungarischen Monarchie. Scale 1:750,000 or 10·3 geographical miles to an inch. Herausgegeben vom k. k. militär-geograph. Institute, Wien. Sheets:—A 5. Civitavecchia, I. Corsica. B 5. Rom, Ancona, Pescara, Velletri. C. Danzig, Colberg, Thorn. F 6. Gallipoli, Brussa. Index. Price 2s. each sheet. (*Dulau.*)

Espagne et Portugal.—Carte dressée sous la direction de M. G. Meissas. Scale 1:5,000,000 or 66·6 geographical miles to an inch. Paris. Hachette. (*Dulau.*)

—, **Maroc, Algérie, Tunisie.**—Carte dressée sous la direction de M. G. Meissas. Scale 1:5,000,000 or 66·6 geographical miles to an inch. (*Dulau.*)

Europa.—Orohydrographische Wandkarte von—. Bearbeitet und herausgegeben von W. Keil. Scale 1:4,000,000 or 55·5 geographical miles to an inch. Theodor Fischer, Kassel, 1884. Price 8s. (*Dulau.*)

—: Geschäfts- und Reise-Karte von—, mit Angabe aller Eisenbahnen, Dampfschiffslinien und Haupt Poststrassen; entworfen und gezeichnet von Th. König. Scale 1:4,350,000 or 59·5 geographical miles to an inch. Mitscher & Röstel, Berlin, 1884. Price 3s. (*Dulau.*)

London.—Stanford's London Government Maps. Scale 1:31,680 or 2·3 inches to a geographical mile. Price, in portfolio, 1l. 10s.; mounted to fold in case, 2l. 2s. E. Stanford, London, 1884.

This series consists of 5 maps compiled from the Ordnance and other Surveys. Each map is drawn on the scale of two inches to a mile, is 40 inches by 27 inches in size, and includes the whole of the Metropolis Local Management Act area, exhibiting plainly all the Main Thoroughfares and most of the Streets, Squares, &c., with their names.

No. 1. *Municipal Districts*, shows the boundary of the jurisdiction of the Board of Works, the boundaries of the City of London, and is coloured to show the Municipal Districts as mentioned in the London Government Bill 1884. It also contains inset letterpress which gives valuable information with reference to the parochial matters.

No. 2. *Water Companies' Districts*, coloured to show the districts within the Metropolitan area actually supplied by the several Water Companies.

No. 3. *Gas Companies' Districts*, showing the districts supplied by each of the Gas Companies.

No. 4. Showing the boundaries of the following *Parliamentary Boroughs*:

Chelsea, Marylebone, Westminster, Finsbury, Hackney, Tower Hamlets, Southwark, Lambeth and Greenwich.

No. 5. *Poor Law Unions and Registration Districts* of London and its environs, showing the boundary of the jurisdiction of the Metropolitan Board of Works, City of London and Poor Law Unions, and Registration Districts.

These cannot fail to be exceedingly useful maps to all interested in metropolitan and parochial work.

Meuse.—Carte du Département de la——, dressée par A. Beckerich, Conducteur des Ponts et Chaussées à Bar-le-Duc. Scale 1 : 160,000 or 2·1 geographical miles to an inch. K. F. Hoeffler, Leipzig. Price 7s. (*Dulau.*)

Nówaja-Semlja.—L. Grinewezkis Reise quer durch——. Scale 1 : 2,200,000 or 30·1 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Seite 213. Justus Perthes, Gotha. (*Dulau.*)

Österreich-Ungarn.—Prozentverhältnis der des Lesens und Schreibens kundigen Bevölkerung in——. Nach den Volkszählungsdaten von 1880–81 berechnet und ausgeführt von Ignaz Hátsek, Königl. ungar. Kartograph. Scale 1 : 3,700,000 or 50·6 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Tafel 9. Justus Perthes, Gotha. (*Dulau.*)

Oesterreichisch-Ungarischen Monarchie.—Specialkarte der——. Scale 1 : 75,000 or 1 geographical mile to an inch. K. k. militär-geografisches Institut, Wien, 1884. Sheets:—Zone 13, Col. XVI. Pressburg und Hainburg. 17—XVII. Devceser und Város-Löd. 18—XVII. Nagy-Vázsony und Badacson-Tomaj. 19—XVIII. Tamási und Igal. 21—XIX. Báltaszék und Pécsvárad. 21—XXI. Maria-Theresiopel. 22—XXIII. Gross Kikinda. 23—XX. Apatin und Erdöd. 23—XXIV. Ótelek und Zsebely. 24—XX. Vukovár. 24—XXI. Német-Palánka und Kulpin. 24—XXII. Neusatz und Peterwardein. 24—XXIII. Gross-Beckerek. 24—XXVII. Borlova und Klopotiva. 25—XX. Šaregrad und Batrovci. 25—XXI. Jlok und Ruma. 25—XXII. Karlowitz u. Titel. 25—XXIII. Antalfalva. 26—XXI. Mitrowitz. 26—XXII. Alt-Pazua und Budjanovci. 26—XXIV. Bavanište und Jaszenova. 26—XXV. Weiskirchen und Szászkabánya. 27—XI. Lussin Piccolo und Puntalon. 27—XXII. Kupinovo. 27—XXV. Alt-Moldova. 27—XXVI. Berzaszka und Ó-Ogradina. 27—XXVII. O(Alt-) Turnu-Severinu. Price 1s. 4d. each sheet. (*Dulau.*)

Ost-Alpen.—Karte der——, in 9 Blättern. Bearbeitet unter Mitwirkung mit der deutschen und oesterreichischen Alpenvereins. Scale 1 : 250,000 or 3·4 geographical miles to an inch. Blatt 3, Die steirischen Alpen und die Karawanken. Blatt 6, Die oesterreichischen Alpen und der Wiener Wald. Price 5s. each sheet. (*Dulau.*)

CHARTS.

North Atlantic Ocean.—Pilot Chart of the——. No. 7, June 1884. Equatorial scale 3·7 degrees to an inch. Prepared by order of the Bureau of Navigation, Commander J. R. Bartlett, U.S.N., Hydrographer. U.S. Hydrographic Office, Washington D.C.

Samana Bay.—Santo Domingo, West Indies. Surveyed by the officers of the U.S.S. *Despatch*, Commander W. R. Bridgman, U.S.N., commanding, 1882. Published May 1884, at the Hydrographic Office, Navy Department, Washington D.C. J. R. Bartlett, Commander U.S.N., Hydrographer to the Bureau of Navigation. (Chart No. 917.) Price 3s. 2d.

EDUCATIONAL.

Palästina.—Wandkarte von——, Bearbeitet von Karl Bamberg. 9 Sheets. Mit Begleitwort von G. Coordes, Seminarlehrer u. Vorsther des Vereins für Erdkunde in Cassel. Price 15s. (*Dulau.*)

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PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

Travel and Ascents in the Himálaya. By W. W. GRAHAM.

(Read at the Evening Meeting, June 9th, 1884.)

I MUST confess that I received the invitation to read a paper before the Royal Geographical Society with considerable apprehension, and that on many grounds. First on the score of my youth and total inexperience in addressing such an audience; again, because to my shame perhaps, I went to India more for sport and adventures than for the advancement of scientific knowledge; and last—by no means least—I am painfully conscious that there are many now present who know much more about the subject than I can hope to tell them. I must not detain you by tracing how the mighty range of the Himálayas forms, after all, only part of the great earth circle of mountains. Rather let me dismiss that in the words of the Hindu poet Kálidása.

“In northern regions, clad in godlike might,
Towers the mountain king, Himálaya light,
Whose giant form, stretching in one vast sweep
Forth from the eastern to the western deep,
Seems, where it joins them, as the measuring rod
O'er the broad earth, laid by its builder God.”

Nor can I enter into any general scientific description of the Himálaya: that would in any case be presumptuous after the elaborate and valuable paper you have lately published in your ‘Proceedings’ from Colonel Godwin-Austen.

The travel I have to describe divides itself into three journeys, i. e. spring in Sikkim, summer in Kumaon, and autumn again in Sikkim. I decided on Sikkim principally owing to the comparative ease of reaching it, and selected as guide Joseph Imboden, of St. Niklaus, whose skill and courage I had frequently seen tried and felt assured of. I wanted to test the so-called winter season, and so started early, landing at Bombay, Feb. 20th, 1883. After a few days at Agra, where I picked up some useful hints from Major Michell, a well-known mountaineer, we went on to Calcutta, and thence to Darjiling. We had no view of the

snows as we went up the wonderful Hill Railway, but instead were treated to a snowstorm and extreme cold. That night I could not sleep a wink. Before dawn I was up and hastened to call Imboden, whom I found in precisely the same state of excitement, and together, we hastened round to the Mall to see the sunrise. Suddenly, far away in the dark and yet incredibly high in the sky, a pale rosy pinnacle stole into light. It was the summit of Kangchinjanga. Downwards stole the first glow, tipping the peaks in succession with a golden glory; then suddenly it vanished, leaving them cold and grey against the dim sky. Presently followed the true sunlight, and again the summits flashed forth their glories as the sun leaped suddenly above the horizon. Only this, only the simple warm red tint, appeared. We did not see, and probably no one ever does see, the atmospheric colouring which is so characteristic of sunrise in the Alps. There were none of those vivid colours, the prismatic green passing to the gorgeous blue, the red to the yellow; no peak gleamed like an opal before the God of Day. Still though a study in a monotone, the view was too noble and grand to do aught but excite admiration in any one beholding it for the first time. Alas! in us it excited something more, and as we turned our lengthening faces from the view we read in each other's eyes "Inaccessible." I was very much surprised, I must confess, as I had been under the impression that the peaks were more remarkable for height than for difficulty. Laden with snow more than their wont, owing to the exceptional winter of 1882-83, they still showed out in all their nakedness huge precipices of black or grey gneiss fringed and bordered with broken and overhanging glacier, that said as plainly as they could speak, "Thus far and no farther."

We were delayed some days, pending the arrival of guns, &c., but managed to get off on the 23rd of March, with a splendid set of coolies, fellows who could carry anything and who simply laughed at the 60 lbs. per man we weighed out for them. The road is fairly good as far as the Ramman, the British boundary, after which it degenerates into what would be flattery to call a track. I will not delay you with our various stages over travelled ground; we made halts at Siriong, Hih, Parmiang-tse, Yoksun, Bora, and reached Jongri on the afternoon of the sixth day. This was extremely fast marching, the distance being 42 miles as the crow flies, and quite double that in actual path; whilst some idea of the road may be formed from the fact that it involves ascents and descents amounting in the whole to 23,000 and 16,000 feet respectively. The last day from Bora to Jongri is very difficult and quite impassable for beasts of burden. We came on snow about 10,000 feet above the sea. Trees grow only to the top of the ridge, rhododendrons, in a thick impervious jungle, even higher. Finally, the ridge flattens out into a rolling table-land, some 14,000 feet above the sea, and here stands a solitary little stone hut, the habitation of the herdsmen in summer.

The next day we took the three best men and proceeded west to

the foot of the Kangla Pass, which leads into Nipal. The summit of the pass is some 17,000 feet, and is crowned by a noble saddle glacier, whilst on either side rises a sharp rock tooth some 1500 feet higher. We turned to the right, to the foot of the glacier which flows in a beautiful stream south-west from Kangchinjanga. Here we encamped on the moraine in one of the grandest amphitheatres imaginable. Due east rose Kabru, 24,015, its western face almost like a wall, corniced with huge masses of glacier and snow, from which thundered an incessant volley of avalanche. North-east rose Kangchinjanga, its grey precipices even now but lightly touched with snow. North, Junnoo showed its awful southern cliff, whilst west rose a great peak of snow and rock, great actually, though small and easy as compared with its neighbours. The night was the coldest we experienced in the Himalaya—8° Fahr. being the minimum reading of the thermometer.

Early next morning Imboden and I started to ascend the peak on our west. It was a hard and interesting scramble of some 5½ hours, rock and snow alternately. Only one place offered any serious difficulty, and at 10.15 we were on the summit. Though the western view was clouded we had a noble view of the north-west of Kangchinjanga. Both by aneroid and by comparison with surrounding peaks we estimated our height as rather over 20,000 feet.* It was too cold to stay long, so we descended, packed up our lightened traps, and returned to Jongri, which we reached after a very long and fatiguing tramp, all very tired. Next day we were off again, this time due north, for the glacier from which flows the Great Rungeet. The descent is steep for about 800 feet, then a steady three miles ascent, over very bad broken ground, leads to the foot of the glacier between Kabru and Pundim. Here we found a series of small lakes, now frozen hard and fast. Up the ice we went till we reached the foot of the Guicho La, the pass between Pundim and the south-east arête of Kangchinjanga. Here we camped amongst a wilderness of huge gneiss boulders. Next morning, after traversing difficult ground, we crossed the pass (rather over 16,000 feet G.T.S.), and descended first to a level bit of grass-land containing five small tarns, and then by a further descent to the great glacier, which flows almost due east from Kangchinjanga. Right above us rose the towering crags of Siniolchum and D₂, behind us lay Kabru and Pundim, so that we were absolutely surrounded by the snowy giants. We thus succeeded in seeing both the northern flanks of Kangchinjanga, and always supposing that the great northern arête can be crossed (which I believe), I should reckon that the circuit of the great peak might be made

* I carried with me an aneroid barometer by Solomons, graduated to 23,000 feet. The heights it gave corresponded, where comparison was possible, within, generally, 100 feet with the G.T.S. heights up to 14,000 feet. Above this, measurements taken with it had only a differential value. It was compared and corrected at Calcutta between each of the three tours here described.

within nine days, at any rate far within the month allowed by Hooker, who, however, based his calculations on known trade-routes. It would involve one pass of 16,000 feet, one double one of 16 and 17,000, and one of nearly 20,000 feet. Snow now began to fall heavily, and we judged it prudent to return at once, reaching Jongri on the next day.

I now considered the expediency of retiring; it was evidently far too early for climbing, the avalanches were incessant on all sides, the cold was intense, and nearly all the coolies were suffering either from frost-bite, snow-blindness, or fever. A straw turned the balance; a cooly, half asleep, from cold, burned my climbing-boots, which I had given him to dry. The next day we started on a retreat almost as precipitate as our advance. One amusing, though somewhat startling, adventure broke the monotony of returning. Imboden and I were on ahead, the ground was deep in snow, though in the forest, and we were shooting small birds. Suddenly, with a crash, a bear broke into the path some five yards in front of us. Imboden, who had the gun, ran up a tree like a lamplighter, whilst I, being unprotected, fairly turned and bolted. Fortunately for me, the bear broke through the snow which bore my weight, and after a chase of about 100 yards, he gave up. When I reached the coolies and got my rifle, we took up the pursuit, but his bearship took refuge in quite an impenetrable cane brake, and we had to relinquish our ideas of vengeance. Nothing more occurred, and we regained Darjiling on the 10th of April.

One cooly we had to leave behind, apparently at death's door with fever. I left him at Hih with some friends, and gave them ample money for him, but could not wait to hear the result. What was worse, Imboden got a touch of fever and diarrhoea, caught in these malarious valleys, and, in addition, became so homesick that I was obliged to send him home.

Then came the difficulty of getting a substitute. I had arranged with Emil Boss, one of the landlords of the *Bär* of Grindelwald, and also a captain in the Swiss Army, to send me out another guide; but at the last moment the men proposed refused or were unable to come alone. In the pluckiest way, Boss himself came at a moment's notice, bringing Ulrich Kauffmann as guide, and a better pair of mountaineers I never wish to meet with.

However, all these preliminaries took time, and it was towards the end of June before the men arrived at Nynsee Tal, whence I proposed to try the Gurhwal range. We started on the 24th, accompanied by M. Décle, a French member of the Alpine Club. As for the first 10 or 11 days we were on a comparatively beaten track, I will hurry over our preliminary marches. Ranikhet, Dourahat, Rawari, Lobah, Narambagar, Nandak Ganga, Ramni camp, Pana, Kuari Pass, Joshimath, being our successive halts. The rains were just beginning and we were much troubled by that awful Indian plague the hill-leech. In length about an inch, and about

thickness of a knitting-needle, the bloodthirstiness of this tiny pest is common. It is no uncommon occurrence to take twenty off at one time, and nothing keeps them out. Décle turned back at Pana, fairly done up by our various troubles, and we went on alone. From Joshimath we went along the Alknanda to Rini, the track in parts consisting of one or two resting on pegs driven into the rock, whilst the water thunders along beneath. From Rini we hoped to attack Nanda Devi, and accordingly proceeded up the Rishi Ganga. After our first march, very short but over difficult and untrodden ground, we were stopped by a very curious phenomenon. A glacier had advanced due north down a lateral ravine from Trisul. It has since retreated, leaving behind a trench worn to the most impassable depth. Five hundred feet is the smallest depth I could give it, and although we very carefully inspected its western side, we could find no way to cross it. Nor was it possible to turn it; and I may here remark on these difficulties in the valleys, before you can get near the peaks, among the most formidable obstacles to Himálayan exploration. Accordingly we had to return, and I then decided to try smaller game, and attempt Dunagiri, 23,186 feet (G.T.S.). We started up the next day, down which flows the Dunagiri Glacier. It is impossible to exaggerate the difficulties of traversing these cañons. After two days along the river we found travelling so difficult that, in sheer despair, we took to the summit of the ridge. After various ups and downs (one ridge we crossed was just 18,000 feet [G.T.S.]) we reached the foot of Dunagiri. We had had some very good sport on the way, especially bagging a snow-leopard, a very rare animal. Here a fresh shock awaited me—the coolies were out of provisions. Although I had supplied them with rations for a fortnight, they had eaten them all in five days. I sent most of them down to a summer village on the north of the ridge, and only retained three with us, one of whom was a little shikari, our local guide.

Next day we took matters very easily, only going to the head of the glacier, where serious climbing began, and camping there. Our height was 18,400 feet (by aneroid and comparison), so I thought it advisable to send the coolies down, an order which they joyfully obeyed. I shall never forget that view. Due south, with the awful gorge of the Rishi Ganga between, rose the Trisuli and Nanda Devi; east was Dunagiri, on whose very flanks we were lying; north stood Kamet with his attendant peaks; whilst on the west towered Gangotri like a wall. Nor was this all, for all these peaks are set with rocky aiguilles, all equally black and all equally impossible. I fear I may be taken to task for using the word "impossible," which some aver should not occur in the climber's dictionary. Still, the powers of man are limited, whilst those of Nature are hardly so. In Switzerland, even, aiguilles, which rarely give more than 1000 feet of hard climbing, long resisted the assaults of the best climbers, and only succumbed after a

long day's toil. What, then, shall be said of these rock-towers, at least equally difficult, and beside which the Matterhorn is a mere dwarf? Many of them show 5000 to 6000 feet of sheer descent, and yet look and are no more than second-class peaks beside their mighty brethren.

The night was comparatively warm, and we rather overslept ourselves, so that it was broad daylight before we had fairly started. Our route lay up the west ridge, and for some considerable distance we got along very well. Then we were forced away from the edge to the southern side of the arête, and here we suffered much from the great heat and the reverberation of the sun's rays from the snow, which took greater effect from the height we had reached. So much did this trouble us that we were all nearly fainting when we reached the summit of the arête.

Kauffmann, who had been unwell at starting, was quite overcome, and utterly unable to proceed. We did not like to leave him, but he begged us not to turn on his account; and as we thought that we must succeed, we made him comfortable, and started by our two selves. We were now on the final slope of the peak, and, though not abnormal, it was a very steep bit of step-cutting. The mist crept up and snow began to fall, and we were thinking of turning, for we had been two hours from Kauffmann, and it was already one. Suddenly the mist cleared away, and we instantly saw the great height which we had reached. Actually below us lay a splendid peak, A_{21} , to which we afterwards gave the name of Mount Monal, 22,516. Over its very summit we saw A_{22} , 21,001, the remaining peak of the Dunagiri chain. We cannot therefore have been less than 22,700, and the summit, not 500 feet above us, was in full sight. We again attacked vigorously, Boss just making notches and I enlarging them to steps. But it was no use; down swept the clouds with a biting hail and wind, and we had to turn. It was with difficulty that we got down again; the mist and stinging of the hail prevented us from seeing the steps clearly, and I fully expected a slip. We picked up Kauffmann and got down with great difficulty, the last part of the way being in darkness. Here another trouble awaited us; everything was soaking wet—matches, food, blankets, and ourselves—whilst the wind cut us like a knife. Boss insisted on our keeping awake, and I have no doubt he was right, but, tired out as I was, it was very unpleasant. Next day we carried our things and got down to our lower camp, to the great joy of our coolies, who had given us up for lost.

As this was the first occasion on which we reached an unusual height, it may not be amiss to give our personal experience. Neither in this nor in any other ascent did we feel any inconvenience in breathing other than the ordinary panting inseparable from any great muscular exertion. Headaches, nausea, bleeding at the nose, temporary loss of sight and hearing, were conspicuous only by their absence, and the only organ perceptibly affected was the heart, whose beatings became very perceptible, quite audible, whilst the pace was decidedly increased.

Unquestionably man's range is increasing. Read any old account of an ascent of Mont Blanc; it was expected that the climber should suffer every possible inconvenience from rarefied air, and the harrowing details were duly forthcoming. Now the ascent is mere child's play, and we hear no more of these agonising horrors. How is this to be accounted for? Many people, friends of my own, have felt various symptoms arising from high ascents; many others, and I amongst the number, have never felt anything of the kind. May it not be that the real strain is on the heart, and that, therefore, those with a weak heart are affected, those with a strong heart escape? I, for one, cannot believe that the air will be a serious hindrance to sound men in the Himálaya, seeing that balloon ascents have been made to 30,000, and even 35,000 feet, and though the aeronauts suffered, it was more from cold than difficulty of breathing. It must be remembered, too, that a balloon ascent is a sudden change, whilst a mountain ascent is made by slow degrees and gradual acclimatisation, and that since half the pressure of the atmosphere is already removed at 18,500 feet, when 24,000 feet has been reached the next 5000 feet will only involve a comparatively small diminution of pressure. Personally I believe that, supposing the actual natural difficulties to be overcome, the air, or the want of it, will prove no obstacle to the ascent of the very highest peaks in the world. I should add that my companions were respectively thirty-two and thirty-eight years of age.

The weather now set in very bad, heavy snow nightly, and we accordingly returned to Rini, and made our preparations for an expedition to Nanda Devi. Profiting by our previous experience, we took the north bank of the river, and in three days of awful weather reached Dunassau. This is a singular little table-land of about 16,000 feet in elevation, and protected on all sides by rocky cliffs from 500 to 1000 feet more. Judging from the shape alone, I should have thought it an extinct volcano, but could find no trace of any volcanic matter. This is used as a pasture-ground in the summer, and we found a flock of beautiful goats, herded by two filthy objects, who were indubitably the lower animals of the two. Here we were fairly stopped by very bad weather, and by violent attacks of diarrhoea, which afflicted both Boss and myself. Our coolies were at least as well or as badly off as ourselves, but they got very frightened, saying that Deva was angry with our presumption, and imploring us to return, lest a worse thing should befall us. Finding us immovable, they cut the Gordian knot, and on the 2nd fourteen of them fairly bolted, leaving us with six in all. We were not going to be beaten, so only taking food and one tent, loading ourselves, we pushed on. For four days we toiled on pretty hard, and reached the foot of the glacier on the fourth day. This was all probably untrodden ground, as we found that the map, part of the Topographical Survey on the large scale of 1 inch to the mile, was highly

inaccurate. I am sorry to have to criticise any work of members of a body from whom I received so much valuable aid and kindness as the Indian Staff, but what can I say when we found one whole range omitted, glaciers portrayed where trees of four feet thickness are growing, and the hill shading generally entirely imaginary? I have the more confidence in this criticism as Mr. Kennedy, who made an expedition with Alpine guides in August last, on the east of Nanda Devi, describes his map, part of the same Survey, as "inaccurate."

The wildness of this gorge is almost indescribable. Some idea of the ground may be formed from the fact that in four days we barely compassed 20 miles. In one place, a peak of 17,056 (G.T.S.) falls almost sheer into the stream, which does not exceed 9000 feet at that spot. In many places it was only by holding on for dear life and using the rope that we could get on at all. At last we were completely brought to a standstill. The river—for even here it is a big stream—comes dashing down a precipice of some 200 feet, and further progress on our side became impossible. Could we have crossed, some three hours would have put us well on the glacier; this, however, was out of the question, for the stream was running with great fury, and whirled away like straws a couple of pines with which we tried to make a bridge.

We had plenty of provisions and sat down deliberately to wait "dum defuat amnis." Luck, however, was against us; the rest of our coolies were frightened by the unusual toil and weather, and bolted, leaving us three alone with one faithful shikari who stuck to us. This was a death-blow to our hopes, and we had to return. It was provoking, for we had been delighted to see that a route was clear and possible to within 2000 feet of the summit. True, the last 2000 feet looked black and threatening, but there is usually a way to be found up rocks when not too lofty. We had to abandon everything but indispensables, and by dint of carrying some 50 lbs. a man, made our way back to the stage before Dunassau. Of course as soon as we got back the weather changed, and we had four most perfect days for climbing. We sent the shikari back to his native village to bring up some coolies, and during his absence made an assault on A₂₁ (22,516). We slept at about 18,000 feet and the next day achieved the ascent very successfully from the western ridge. It was a fair climb, but presented no great difficulties. We called the peak Mount Monal, from the unusual number of those lovely snow-pheasants we saw on it. We then decided to try the third and last peak in the Dunagiri range, A₂₂ (21,001). I had not much hope of success, as it was extraordinarily steep, no snow lying on it. We slept well above the snow-line in one of the most extraordinary places I have seen. We had marked a cavern to sleep in, and when we reached it we found it contained what I can only describe as a miniature subterranean glacier which was fed by an aperture at the back from a small basin of névé above. It was

very curious to see the floor of the cave, about 100 feet by 30, exhibiting imitations of all the usual glacier phenomena, with crevasses, two moraines, &c. The surface, however, was smooth and polished, and did not exhibit the worn and rough appearance produced by exposure to the sun. It differed from the Swiss and Savoy ice-caves described by Mr. Browne, in being fed from permanent snows and not from the drift of winter storms. On the morrow, as I expected, we were defeated. We reached a height rather over 20,000 feet (estimated), but were fairly stopped by the last precipice.

On our return we found the coolies had arrived, so we went back to Rini and thence by stages to Nynee Tal. We returned by the great pilgrim route viâ Nand Prayag and Karam Prayag, meeting many hundreds of the pious on their way to Budrinâth and the sacred shrines. The road, particularly after the rains, was in a very bad state, but this is the normal state of hill-roads, which are usually left to look after themselves till a message arrives that the Governor or some great man is coming along. No particular incident broke the 150-mile tramp, and we got back into Nynee Tal on August 12th, having had a pleasant, if not very successful, trip.

We then prepared for what we intended to be our *pièce de résistance*, i. e. another trip to Sikkim. We made all our preparations in Calcutta, reached Darjiling on the 22nd, and were able to start on the 25th of the same month. I took the same Sirdar as I had before—a sturdy, honest Tibetan, by name Gaga, who had the extra advantage of speaking Hindustani and a little English. This time, however, we were not so fortunate with our coolies. Owing to the abundant employment at Darjiling itself, it was very difficult to get good men, and we were finally obliged to put up with rather a scratch pack, over whom Gaga had little control. We soon found this out, for they took to halting wherever they thought proper, and one deliberately set down his load and bolted. The road was worse than before, owing to the constant rains, and leeches were in swarms. The extraordinary number of insects and their aggressiveness is one of the greatest drawbacks to travelling in Sikkim. Mosquitoes are bad enough, bamboo ticks are worse, but the pinnacle of infamy belongs unquestionably to the "peepsa." This is a tiny dipterous fly, probably of the genus *Simulium*, whose bite leaves a small spot of extravasated blood under the skin, and whether you open it or leave it alone, the irritation is equally intense. Kerosene oil we found kept them off in some measure, but even that was not of much account. On the other hand, there was something to make up for these little troubles. The jungle was magnificent, creepers, orchids, and the most superb magnolias; whilst the size and variety of the moths and butterflies is almost beyond description. We amassed a little collection of over 200 varieties, and a German collector at Darjiling caught in one year, within a radius of 30 miles, upwards of 800 varieties,

nearly one-half of which were butterflies and more than 100 absolutely new to science.

Our progress was necessarily slow, and we only reached Jongri on the 2nd of September, i. e. in nine days. We found the hut now occupied by a goitrous old woman and her grandson. They were the guardians of the herd of yak which are annually sent up to these rich pastures. A few presents made them readily allow us to share the house, which was certainly better than tents. As a general rule, September is fairly fine in the mountains, but last year (1883) was very abnormal, and, to our horror, the rains set in worse than ever. The coolies became very discontented, and I finally decided to dismiss most of them. As there would be no climbing for at least a fortnight, we sent the Sirdar with four others back to Darjiling to bring up half a dozen more amenable porters, and also a further supply of rice. Two others were sent to bring some rice we had left at Yoksun, two remained with us, and the rest were paid off and dismissed. On the 4th and 5th of September we explored the west side of Kabru and followed the great glacier which descends from Kangchinjanga.

On the 23rd we crossed the Guicho La, purposing to attack Pundim from the north, but, on reconnoitring, we found it quite impracticable. I do not know of any more formidable peak. On the west side it drops sheer, whilst the other three are guarded by the most extraordinary overhanging glaciers, which quite forbid any attempt. We returned on the 26th, the weather being consistently bad, and it was not till the 29th that the break came. That night we had a bitter frost, and the stars flashed out once more. Early on the 30th of September we started for Jubonu, which lies immediately east of our camp. At 2 P.M. we had reached a suitable place, well above snow-line, and camped there. Height by aneroid was 18,300, and, though absolute reliance cannot be placed on such uncorrected observations, I think that at least 18,000 may be taken as correct. We got off at earliest dawn the next day, i. e. at 4.30, and settled down to our work at once, leaving the coolies behind. The snow was in good order, and Kauffmann led the way at a great pace. He is, I believe, generally admitted to be one of the fastest step-cutters living, and this day and afterwards he fairly surpassed himself. The glacier was crowned with steep rocks, which formed the edge of a noble amphitheatre formed by Jubonu and Nursingh. We were now on the peak itself, and proceeded to cut up a steep snow couloir. This gradually got steeper, till we were forced to take to the rocks. With the exception of one place, which greatly resembled the celebrated Chimney on the Broil side of the Matterhorn, we got along very well, till we reached the final crags, which rose some 300 feet above us. We now turned northwards along the slopes of the glacier, which swept down from the rocks. Fortunately there was an incipient bergschrund, and we passed along in this to the north side, whence a short but exceedingly steep slope of

neve led us to the summit, which we reached at 11 A.M. without a halt. This was incomparably the hardest ascent we had in the Himálaya, owing to the great steepness of the glacier work. I consider—and in this I am borne out by both my companions—that glaciers lie at a greater angle in the Himálaya than in Switzerland; and indeed the general slope of the peaks is greater.

The height of the peak is 21,300 or 21,400 feet, according to G.T.S. measurements. In the descent we suffered considerably from the heat, which is felt much more at these elevations than is perhaps generally supposed. On the 3rd we examined carefully the eastern face of Kabru, and made all preparations for an assault. On the 6th we finally started, and made our way up the eastern glacier of Kabru. On its banks we met with immense quantities of Edelweiss, the climber's flower, and success was prophesied accordingly. We climbed up the highest moraine I have seen (fully 800 feet) to the base of the eastern cliff of Kabru. There was only one route to the higher slopes, and that we could not find in the mist. Heavy snow fell, and we camped where we were. Next day we found our opening, and worked up it. We three went on ahead, and pushed straight up the face of the ridge, intending, if possible, to camp on its summit. This we reached at midday, but found that we were cut off from the true peak by a chasm in the arête, so that we were on a detached buttress. We descended, met the coolies ascending, and turned north along the steep snow slope, finding at last a small ledge just big enough to accommodate the Whympertent.

This was, I think, the highest camp we had, being certainly 18,500 feet. I estimate this by aneroid and comparison. The night, however, was mild, and the coolies, who were very tired, preferred to stay up instead of descending as before. We were off next morning at 4.30, and found at once all our work cut out for us. The very first thing was the worst. A long couloir like a half-funnel, crowned with rocks, had to be passed. The snow was lying loose, just ready to slide, and the greatest possible care had to be taken to avoid an avalanche. Then a steep ice-slope led us to a snow incline, and so to the foot of the true peak. Here we had nearly 1000 feet of most delightful rock-work, forming a perfect staircase. At 10 we were at the top of this, and not more than 1500 feet above was the eastern summit. A short halt for food and then came the tug of war. All this last slope is pure ice, at an angle from 45° to nearly 60°. Owing to the heavy snow and the subsequent frost, it was coated three or four inches deep with frozen snow, and up this coating we cut. I am perfectly aware that it was a most hazardous proceeding, and in cold blood, I should not try it again, but only in this state would the ascent have been possible in the time. Kauffmann led all the way, and at 12.15 we reached the lower summit of Kabru, at least 23,700 feet above sea. The glories of the view were beyond all compare. North-

west, less than 70 miles, lay Mount Everest, and I pointed it out to Boss, who had never seen it, as the highest mountain in the world. "That it cannot be," he replied; "those are higher"—pointing to two peaks which towered far above the second and more distant range, and showed over the slope of Everest—at a rough guess some 80 to 100 miles further north. I was astonished, but we were all agreed that, in our judgment, the unknown peaks, one rock and one snow, were loftier. Of course, such an idea rests purely on eyesight; but, looking from such a height, objects appear in their true proportions, and we could distinguish perfectly between the peaks of known measurements, however slight the differences. It has been suggested to me since that we mistook Mount Everest; but this is impossible; for just here occurs the remarkable break in the chain, and there is no snow range at all between Kabru and the group of Mount Everest. However, we had no long time for the view, for the actual summit was connected with ours by a short arête, and rose about 300 feet of the steepest ice I have seen. We went at it, and after an hour and a half we reached our goal. The summit was cleft by three gashes, and into one of these we got. The absolute summit was little more than a pillar of ice, and rose at most 30 or 40 feet above us still, but, independently of the extreme difficulty and danger of attempting it, we had no time. A bottle was left at our highest point, and we descended. The descent was worse than the ascent, and we had to proceed backwards, as the snow might give way at any moment. At last we reached the rocks, and there we fixed a large Bhotia flag on a smooth slab. We then hastened on, the latter part of the descent being made in the dark, and finally turned into camp at 10, having been much helped by a brilliant moon. The ascent was dangerous rather than difficult, but without the new snow the difficulties would have been enormously increased. During the ascent we saw a pair of snow-white hawks at a height of quite 22,000 feet, and their flight did not seem to be in the least impaired by any atmospheric effect.*

We felt, after this success, emboldened enough to try something even more formidable, and having engaged some more coolies from Yoksun, on the 13th we started for the Kang La once more. This time we held on due west and camped at the foot of the glacier. Next morning we crossed the pass, 17,500 (G.T.S.), into Nipal, and I ascended a peak west of the pass of which the G.T. height is nearly 19,000 feet. From this we were able to carefully examine Junnoo, and came to the conclusion that it was too late to attempt such an ascent. We thought that we could again distinguish the afore-mentioned great peaks, but the horizon was not so defined as on our previous view. We accordingly gave up further

* The summit of Kabru is given by the G.T.S., the high accuracy of which is, I believe, undisputable, at 24,015 feet. Our point must therefore have been within a few feet of 24,000 feet.

ascents, and returned by steady marches to Darjiling, which we reached on the 22nd.

One more trip we made, starting on the 29th. We went up the Teesta Valley viâ Tumlong, and Cheungtam to the juncture of the Zemu and the Lachen, where we halted at the foot of D., 19,183. The winter set in with heavy snow before we could recommence climbing, and we were obliged to finally refrain. We returned and reached Darjiling once more, on the 21st, and soon afterwards Kauffmann left for Switzerland, Boss remaining with me for a shooting trip in the Terai.

And here in mentioning them for the last time I must pay a tribute to my two Swiss companions, a tribute the more necessary in one case as the hasty sentences of a private letter have found a publicity and been given a meaning equally far from my intention. Comparisons are proverbially odious; but this I must say that both men are admirable in all the qualities that make the ordinary first-rate Alpine guide. Wherever a strong arm was needed to overcome mountain obstacles, Kauffmann's was ready. It is no disparagement to him to say that Boss was something more. He has that power of pathfinding which is rare equally among guides and mountaineers; he has that still rarer power of being daunted by no unfamiliar obstacle or danger, whether above or below the snow-line, which makes the true traveller. I could say more but that he is present to-night, and I fear to hurt his modesty. I will only add an expression of the pleasure with which I have heard that the Council of the Society has distinguished him by a prize which I am sure he will always highly value.

I may mention in conclusion that I left the corrections we were enabled to make in the maps of the Sikkim frontier, in the hands of the Survey Department in India. I shall not venture into details I can hardly, without the sheets before me, succeed in rendering intelligible. I ought to state, however, that your map-maker has been placed at a disadvantage in preparing the diagrams before you, inasmuch as the sheets of the new survey of Sikkim, on a scale of 2 miles to the inch, which I procured in India, are not as yet to be obtained in this country, and do not even—I believe Mr. Saunders will confirm me—exist in the India Office. The best maps you have in Savile Row misplace some of the main spurs and valleys of the Kangchinjanga group. The new map constructed by Mr. W. Roberts is a work of admirable accuracy up to the snow-line, and covers a district of extraordinary difficulty to the surveyor, owing to the dense jungle and the number of intersecting ridges and valleys.

Previous to the reading of the above,

The PRESIDENT said he had the pleasure of introducing to the meeting Mr. Graham, who had won the distinction of having reached a higher point above the level of the sea, in mountain climbing, than any other living man, except his companion Emil Boss. The subject of the Himálayas was one which was more familiar to the

Society years ago than it had been of late. During the period when the survey of India was conducted by Colonel Montgomerie, our knowledge of the Himálayas—at least of the ranges beyond the Himálaya proper—was immensely extended, as many as 70,000 square miles of the roughest country in the world having been surveyed. But Colonel Montgomerie necessarily had recourse to Indian pundits trained to the work, who penetrated where Europeans could not. They concealed their instruments and passed as merchants, and in this way made known vast tracts of country and the courses of rivers which before were previously unknown. In 1865 Colonel Montgomerie received the Society's gold medal, and in 1872 one of his pundits also received a gold medal for the great services he had rendered in making known the upper course of the Brahmaputra, and his determination of the exact situation of Lhasa. Since then various distinguished travellers, such as Colonel Trotter, Sir Douglas Forsyth, Colonel Godwin-Austen, and others, had visited the trans-Himálayan ranges, and none who heard it could forget the interesting and charming lecture delivered by Sir Richard Temple on the mountain region of Sikkim. He remembered at one of the anniversary dinners hearing a most interesting speech from Professor Huxley, in which he referred to the division of mankind by some persons into two sorts of men—those whom you would like to have with you if you were tiger hunting, and those whom you would not. Now it seemed that Mr. Graham would tell them that he found in Mr. Boss a person whom he would like to have with him in the moment of danger and difficulty, and what Mr. Boss thought of Mr. Graham might be gathered from a letter which the former had written to Mr. Freshfield, and which without any improper breach of confidence, and without causing a blush on Mr. Graham's face, he would read to the Society. It was written in March last from Grindelwald:—"I left Mr. Graham in Madras beginning of February; he intended to see the Presidency and return to England April or May. He was in splendid health, and I have no fear that he will not mind, nor suffer from, the climate, although it began to be rather warm, because I have never seen a man with such a constitution as Mr. Graham's, combined with the power of mind to believe no change can affect one, which does much to keep one in good health. I have enjoyed myself very much indeed during the whole of the trip, thanks to the great kindness Mr. Graham showed me all the time; and though I had left home and business at a time when I ought not to have done so, I must confess that, thanks to him, I *never* regretted it one moment, but would, as I now know him, do so *again* with pleasure any moment that he liked, and wherever he would care to go, because I found him to be the best companion I ever was out on the rough with, and consider him one of the best men I ever met.—Yours, EMIL BOSS."

On receiving the Back prize, one of the distinctions which our Council only bestows on enterprising travellers, Mr. Boss wrote an acknowledgment to Mr. Freshfield, in which he said, "I am very glad indeed to accept the prize you kindly, though undeservedly, bestowed on me, although I now and always shall *think, say,* and *know* that it has been *English* pluck and perseverance that have achieved the results in the expedition." With this preface he begged to introduce Mr. Graham.

After the Paper,

SIR RICHARD TEMPLE wished to offer his unfeigned thanks to Mr. Graham for his interesting paper. He reminded the members of the Society that they had now seen face to face the man who had accomplished the highest ascent on record. He spoke in the presence of the President of the Alpine Club, and might say that the ascent which Mr. Graham had described exceeded by 1700 feet the highest that had previously been accomplished. Though Mr. Graham had modestly said that he

undertook the expedition in search of sport and adventure, he had rendered a great service to science, and had described his adventures with a natural energy of thought and a picturesque originality of diction that were worthy of the occasion. He had had the advantage of reading the paper, and hoped the Society would not be content with having heard it, but would read it in the Journal. They would then find that Mr. Graham had been obliged to omit many interesting passages. They would observe the remarkable geographical acumen with which he had pointed out the configuration of the Himálayan region. He had shown that in reality the true wall of the abode of everlasting snow was a long line of watershed, and that the commonly known peaks of the Himálayas were really great southern outworks of that mighty wall. Had time permitted, Mr. Graham would have read an excellent description of the various outworks, describing the first of them lying north of Kashmir; secondly, the outworks which formed the source of the Gauges and the Jumna; then the outworks north of Kangchinjanga, which he himself said presented the most awful series of impossibilities that a climber could look upon; then the great outworks north of Nipal, with Mount Everest; then the group of Kangchinjanga, north of Sikkim; then the Chimolari, which was long considered the highest mountain in the world; and lastly, the outwork north of Bhutan, which he seemed to think was still involved in obscurity, but he (Sir Richard Temple) had seen that earthwork, which was visible to those who navigated the upper course of the Brahmaputra. The lessons to be learnt from the lecture were four in number. First, the members could not fail to be struck with the remarkable scope which still remained for mountaineering exploration in the Himálayas. Although English surveyors had measured a host of peaks, still vast mountain regions remained unexplored, and he earnestly hoped that the influence of the Royal Geographical Society among other influences would induce the Government in India to give more attention than ever to mountaineering exploration. Still, as an old political officer, he must ask them to bear in mind that the Government of India had great political difficulties to contend with. It was all very well to say that the Russians or other nations had succeeded in exploring certain parts, but they had milder characters to deal with in Mongolia than the British had in the Himálayas; and although he was far from saying that the task of mountaineering exploration in Nipal and Bhutan should be resigned as hopeless, yet premature attempts at exploration might lead to bloodshed and war, and, valuable as geographical exploration was, practical politicians must count the cost. The next great lesson to be learnt from Mr. Graham's paper was the value of what he called icemanship. That was a capital phrase, and he hoped it would sink into the hearts of the people of England and the Government of India; for although our surveyors had done wonders in this line—wonders to which Mr. Graham paid a justly deserved tribute—it must be remembered that they were subjected to the physical depression of the Indian climate, and could not possibly be professional mountaineers. He was sanguine that the President of the Alpine Club would bear him out when he said that mountaineering was a practical art, a profession which absorbed all a man's thoughts and time, and if the glacier world above the line of everlasting snow was to be properly delineated it must be by a staff of trained mountaineers who might be either Englishmen or Swiss, but they must be trained in the Alps. When once such men were set to work in the Himálayas, it would be possible to train the natives of India to follow in their footsteps. The paper had told them how enduring, how resolute, how skilful the native labourers and carriers were, and no doubt they would accomplish a great deal under the training of such men as Boss, Kauffmann, and Imboden. The third lesson to be learnt was that the highest peaks could be ascended by men of strong heart physically with much less physical danger than had hitherto been supposed. It was all very well for Mr. Graham to

say that headache and giddiness and nausea were conspicuous by their absence, but he (Sir R. Temple) could assure him that those phenomena had been observed by others conspicuous by their presence. Those that undertook such a task should be in the highest physical condition, and then they might ascend to the highest peaks in the world. The fourth lesson to be learnt was the great value to science of explorations in the glacier world in those lofty regions. Those who were acquainted with the charming works of Tyndall and others in Switzerland, could readily imagine how much greater the instruction would be if they could explore altitudes 14,000 or 15,000 feet above the summit of Mont Blanc. It was to be hoped that Mr. Graham would be tempted by the happy recollection of his visit to India, and by the cordial manner in which he had been received by his countrymen at home, to repeat his visit to the Himálayas, and see whether the flag which he had put there had been displaced, and whether the bottle had stood the test of time and the wear and tear of the climate in that extreme altitude. Let him remember that he had written upon his banner the motto of "Excelsior." He had ascended Kabru, but still above him the lofty precipices of Junnoo cried "Excelsior"; and when he ascended Junnoo there was Kangchinjanga still saying "Excelsior." He recommended the members of the Society not to trust to the feeble descriptions which were given to them of those mountain regions, or even to the instructive paper which Mr. Graham had read, but to go and visit the Himálayas for themselves. Their countrymen out there would receive visitors with open arms, and the journey might be undertaken far more easily than in former times. Places where he (Sir Richard Temple) had to ride or walk laboriously might now be passed over at full gallop, and besides that, there was the wonderful Hill railway, where a train could be dragged up a mountain side by a powerful chain worked by a wheel at the end. Then, if they got an introduction to the Governor of Bengal, perhaps he would put them in the house where he (Sir R. Temple) used to live, from the bedroom window of which they might see that glorious view which Mr. Graham had depicted just as he used to see it daily from his study. Besides that, they might ride all over the road which he made smooth for the benefit of tourists and politicians, and might ascend to that range which divided Nípal from Sikkim. Then, with one sweep of the eye, they would see two of the great southern outworks of the Himálayas, one of which Mr. Graham had ascended. To their right front would be the whole mass of Kangchinjanga; on the left front, a little in the distance, the whole group of Mount Everest, and behind that peak another higher still. If they did that and watched the glorious sunrise effects upon the altitudes, and then let their eye move down to the depths of the valleys beneath, they would learn that the eye could sweep over an unbroken descent of 25,000 or 26,000 feet, and would return home with a grateful sense to Providence that the British nation had been given empire over such glorious scenes. Their ideas would be brightened, their thoughts elevated, and, in the words of the poet, they would

"Look through nature up to nature's God."

Sir JOSEPH HOOKER said he had great pleasure in congratulating Mr. Graham on his exploits, and all the more because he had long wished that some one who had experience of Swiss glaciers would attempt the Himálayas. He thanked Mr. Graham most heartily for the flattering way in which he had spoken of his (Sir Joseph Hooker's) labours, and for the vivid way in which he had brought before him scenes which had charmed his eye half a lifetime ago. There could be no doubt that he had performed a great feat of ascension, and had so far extended our knowledge of the peaks and glaciers of the Himálayas. There were present, however, some men who, thirty, forty, fifty years ago, described from their own knowledge

the physical features of the Himalayas. Men like Thomson, Waugh, Strachey, Walker, Hodgson, had written ably and well on the features of the range, and of the great peaks on the high land behind. He was sure that Mr. Graham would not claim those discoveries as his own. In the introduction to his paper he had given a very neat sketch of the Himálayas, and it was an admirable foretaste of what was to follow. He wished to ask whether he took the bearings of the peaks he saw to the north of the range between Kangchinjanga and Everest, because he (Sir Joseph Hooker) could not help thinking that he saw them himself and took their bearings from a point some 60 miles north-east of Mr. Graham's position. He also desired to ask what was the state of Mr. Graham's barometers and aneroids, and whether they were tested and compared after he came down. Mr. Graham's statement about the non-effect of great elevations on the human frame reminded him of a friend who declared that everybody who was sea-sick must have a diseased stomach. He himself had spent a good many months at elevations of 16,000 or 18,000 feet, but he never knew what it was to go a few miles outside his tent without feeling great pressure, or to walk up to 18,000 feet without a feeling of having a pound of lead on each knee-cap, two pounds in the pit of his stomach, and a hoop of iron around his head, and he always returned to camp with nausea. He did not think his heart was a bad one, for it had lasted him all his life, but he had experienced the same feelings at lofty elevations in Africa and Europe as in the Himálayas, so that he thought there must be some superiority in Mr. Graham's organisation which was not shared by every one, and upon which he congratulated him.

General WALKER said he had long lived on the outskirts of the Himálayas, but had not had any opportunities of penetrating far into them. In his younger days, when he had to make surveys, political reasons had prevented him going beyond the frontier, and afterwards when operations were being carried on in Kashmir and on the verges of Tibet he was at the head of the Department, and the field work was done by officers under him. Mr. Graham's criticisms of the surveys showed that the English language was very deficient in suitable words to express the ideas that had occasionally to be presented in connection with survey operations; thus there was no more unfortunate word than "survey," for it was applied alike to the general view of a region, as obtained from the summit of a mountain peak, and to the topographical delineation of the region, which was a totally different and distinct thing. Mr. Graham had correctly stated that certain maps of the Himálayas in the Indian Survey Department were very inaccurate, but it should be remembered that these maps were not the result of topographical surveying. In many cases the work by the Survey officers in the Himálayas was merely rough sketching, done often at very great distances. There was present an officer of the Survey Department (Major Hoklich) who had recently ascended the Takht-i-Sulimán and a few other peaks, from which he had, in the common acceptation of the word, surveyed 50,000 square miles, equal to the whole area of England; but if a few years hence some Alpine mountaineers succeeded in penetrating into those regions they would no doubt find that there was a great deal of inaccurate topography, for it was humanly impossible for anybody to make a topographical survey of 50,000 square miles in four or five days, or four or five weeks. Portions of the region recently visited by Mr. Graham had been sketched by the Survey officers at the rate of over 500 square miles in a month, which of course would not permit of accurate topography, or more than rough generalisation. No doubt it would be of great advantage in Himálayan surveys to have more mountaineering, but the Survey work in the Himálayas had not suffered from the officers shrinking at any physical difficulty. They had all ascended as high and gone as far as they possibly could in the short time that the regions were accessible. India was governed by a very practical

government which looked for returns in work of which the value was proportional to the cost. If a party of Survey officers with a detachment of mountaineers from Switzerland travelled in the mountains for eight or nine months, they might bring back tales of hardy exploits which would be most interesting to the Alpine Club and to the Geographical Society, but if they did nothing more, and brought back no topography and only a few barometric measurements of differential heights, he was afraid that the Government of India would not be altogether satisfied with the result. The real reason why peaks higher than 23,000 feet had not been ascended was that there was not a sufficient staff of officers and men to employ upon the task of the topography of the higher regions. Sir Joseph Hooker having spoken of the peak which he saw from the pass at the head of the Donkia, he (General Walker) would point out that Sir Joseph had penetrated further into Tibet half a lifetime ago than any European had since succeeded in doing, and had reached a hill beyond the borders of Sikkim, from which one of the great snowy ranges of Tibet was visible in the distance; but seeing this range from a single point only, he was not able to determine the distances and heights of its peaks. It is impossible to fix distant peaks excepting by observations from at least two, if not three stations situated at some distance apart from each other, the third station being not only desirable as a check on the two first, but often absolutely necessary to prove that the points at each station have been truly identified; for when seen from a distance the peaks of a snowy range look pretty much as alike as the teeth of a comb, and when several such ranges appear simultaneously in the field of view, it is no easy matter to identify at a second station the particular teeth of the comb which have been observed at the first. It is very probable that there are higher points on the Tibetan ranges than the highest yet discovered on the Himálayan ranges; but this question can only be decided—at least from the side of India—by observations at stations situated on the higher Himálayas, as these ranges intercept all view of the Tibetan ranges from the south. Three years ago Captain Harman, who was then employed on the survey of Sikkim, made a daring attempt to fix the peaks of the Tibetan ranges, by observations from several stations on the Kangchinjanga-Donkia range. His first station was over the Donkia Pass, near the position reached by Sir Joseph Hooker; here he saw a grand snowy range in the distance, extending as he estimated 150 miles from east to west. He was overjoyed at the sight, but it was late in the afternoon when he reached his station, and many of the peaks were hidden by clouds. Knowing that they would probably disappear at sunset, he determined to bivouac on the spot for the night. Unfortunately he had not brought sufficient clothes with him, and simply shared a blanket with his two guides. The result was he was badly frostbitten, and he never recovered from the effects of the injuries he then received. If this calamity had not happened to him, no doubt the distant range would in a few days have had all its most prominent peaks fixed from end to end. Captain Harman tried to move about on crutches and carry out his work, but at last he had to give it up and return to Darjiling, and two years afterwards he died. He was a fine, noble fellow, and had he been associated with Mr. Graham, the two between them would probably have obtained most valuable results. He (General Walker) trusted that an opportunity would be afforded for completing the work on the frontier by the combined efforts of skilled mountaineers like Mr. Graham, and skilled surveyors like the late Captain Harman.

General STRACHEY said he would not at that late hour attempt any detailed observations on Mr. Graham's paper, but if his account of what he had seen and done should induce others to follow in his footsteps, his advice to them would be to get ice-manship if possible, and to have a strong heart, but above all things to take with them the lamp of science, which would intensify all their enjoyments, and enable

them to understand what they saw, and to bring back an account of what they had done which would really add to the stock of valuable knowledge which the world possessed with regard to those mountains.

Mr. GRAHAM said the bearing of the high peaks which he saw was almost due north-west, with a trifle west. When he got down he had his instruments compared, and they were fairly accurate. Many of the heights were well known, and the aneroid barometer might be fairly reckoned on for differential measurements.

Mr. FRESHFIELD observed that in one of the surveys published by the Indian Survey Department two peaks with an indication "Very high snowy peaks," were put down on the authority of one of the native surveyors or pundits, "No. 9," to the north-west of Kabru, north of the Arun river, and north-east of Mount Everest, on the real water-parting of the Himálayas.

General WALKER replied that the bearing of those peaks was no doubt all right, but the native explorers had no means of estimating the altitude, which might be anything between 20,000 feet and 30,000 feet.

The PRESIDENT, in proposing a vote of thanks to Mr. Graham, said that gentleman had taken them to one of the most magnificent regions in the world, and considering that he went to India more for sport and adventure than for the advancement of science, he had shown that he was a discoverer of more than ordinary intelligence. If he returned to those regions he would do so still better, supplied with the lamp of science to which General Strachey had referred. It was interesting to note how surveyors and discoverers had discrowned one peak after another from being the highest in the world. In his youth Dhawalagiri was considered to have dethroned the Andes; soon after Kangchinjanga was discovered to overtop Dhawalagiri; then came a great surveyor who dethroned Kangchinjanga in favour of the mountain which now bore the name of Mount Everest; and now, if Mr. Graham was right, and there appeared to be no reason to doubt it, Mount Everest must bow its cloud-capped head. No doubt others would be stirred to rival Mr. Graham, and very soon the mystery would be solved. At any rate, Mr. Graham had made a very interesting addition to the knowledge of this stupendous region, and it must be very gratifying to men like Sir Joseph Hooker, who led the way there, to find that they were followed by youthful adventurers like Mr. Graham.

A Journey into the Interior of Ashanti.

By Captain BRANDON KIRBY.

(Read at the Evening Meeting, June 23rd, 1881.)

Map, p. 488.

THE following is a brief account of a journey I have recently made to the northern limits of what was formerly the Ashanti kingdom. Although many white people have visited Coomassie and the country to the east and west of it, I believe I am the first white man who has penetrated the country due north of Coomassie through Coranza, and who has reached in that district the southern limits of those inland nations who had hitherto been prevented from communication with the seaboard by the formerly impassable barrier of Ashanti power.

I may state that my first introduction to West Africa was in 1881,

when, hearing of a threatened Ashanti war, I volunteered at a very short notice for the Gold Coast Constabulary and proceeded to Elmina on the staff of H.E. Sir Samuel Rowe.

We landed at Elmina on the 4th of March, 1881, and in a short time after the whole of the Ashanti difficulty was overcome. The golden axe, an emblem of war, which had previously been sent to the coast with a very warlike message, had, together with about 6000*l.* in gold, been sent home accompanied by an apology from the King of Ashanti. Six weeks after landing I found myself one of the few remaining members of His Excellency's staff; the others having all returned directly the difficulties had been settled. After this I visited nearly all the country within the protectorate, proceeding from Prah sue, which marks the limit of the protectorate, to Accra, *via* Assin and Eastern and Western Akim. I afterwards visited the Volta district and Lagos, proceeding home on leave in May 1882. I returned to the West Coast again in December of the same year, and in the April of 1883 I accompanied Captain Barrow on his mission to Coomassie, living in and around that city for nearly five weeks. During this time I visited the ex-King Coffee Kalkali; King Coffee informed me that although he had had white men prisoners and had fought white soldiers, I was the first white he had conversed with. In the commencement of 1884 I started, by command of Sir Samuel Rowe, on another journey to the Ashanti kingdom, and it was whilst performing this mission that I succeeded in pushing my way to its extreme northern limits. During the short time I had been in West Africa, the Ashanti kingdom had undergone some very considerable changes, and in 1883, instead of a golden axe being sent to the Governor, it was a message begging of His Excellency to assist in quelling a civil war that was then proceeding in Ashanti, and asking the Governor to give his judgment in favour of either of the rival candidates.

The Ashanti chiefs begged Sir Samuel to hold a durbar at Prah sue and hear the rival claims, and it was part of my mission to visit all the chief towns of Ashanti and gather what information I could for the use of the Governor.

Since the intervention of His Excellency towards peace, Coomassie shows signs of again returning partly to its old prosperity. The streets and chief palaces, which suffered during the recent civil war, are being rapidly rebuilt, but I do not think that Ashanti as a power will regain its old strength over the neighbouring tribes, although for a distance of about 50 miles round Coomassie the Ashanti King's word will be law; I was informed by Quaco Duah, the new King, that, acting on the advice of the British Governor and also the wish of the white Queen, he had stopped all human sacrifices. This was fully borne out by the non-existence of any carrion birds round Coomassie and its suburbs. On my previous visit to Coomassie the place was literally swarming with these birds.

Gold is still found in small quantities in the streets of Coomassie, but, being surface gold, it is worked only during the rainy season. All gold found in Coomassie pays a duty of 50 per cent. The gold taken in duty is given to the royal goldsmith to be worked up in the regalia of the country. Gold ornaments, &c., are all cast, a wax model being first made and then cast from clay. Gold-mining in Ashanti may be said to be entirely confined to the provinces of Dadiassie and Inquanta, and the seam of gold which runs through them appears to be a continuation of the seam that starts near Kibbi, Eastern Akim, and proceeds in a westerly direction through Western Akim, entering Ashanti near Amantia, at which place in Ashanti gold-mining first commences. This seam then passes through Dadiassie and proceeding through a portion of the Adansi country near Fomenah, the capital, strikes south and thence through Inquanta, and so on into the Tarquah country, which is again within the protectorate.

In Bowditch's work on Ashanti, mention is made of the King and chiefs wearing leather boots and dresses. Although I myself, during my visits to Coomassie, have never seen any of these things, Bowditch's description quite tallies with the leather goods offered for sale in Quantampoh. In old days Coomassie being able to command all the roads to the interior, she was always in a position to procure an abundant supply of these articles.

Amongst the new branches of commerce starting in Ashanti is the indiarubber trade. The forest from Adansi to Coomassie, and so on in a north-east direction to Mampong, is very full of the indiarubber vine. At present all this industry is in the hands of natives from the protectorate.

Some 80 to 100 miles north of Coomassie, the first open country is struck. By this I mean that the dense jungle which commences near the sea-coast, and continues 100 miles west of Coomassie, is passed, and one enters a country with very long grass and a few stunted trees at irregular distances apart, closely resembling an apple orchard in winter. During my journey north these trees had quite a blighted appearance; none of them having any leaves on them, and the stems being very much scorched from the continual burning of the grass round them. But on my return journey in a few weeks, they had all started into leaf again. On leaving the dense bush the soil immediately becomes sandy, and all mud houses cease; the house of the native being the circular grass hut with a hole through which to crawl in, and in shape like a beehive.

Quantampoh is situated north-east of Coomassie about 80 miles. It is built in the midst of a large sandy plain, every particle of wood having been cleared away for some miles round. The resident population of Quantampoh is about 15,000, and the traders passing through would be about 25,000, making altogether a population of 40,000. Quantampoh was in old days one of the principal, if not the principal, ivory markets for this part of Africa, but owing to the continual wars

in Ashanti and its borders, and also the blocked state of the roads leading to the seaboard, combined with the heavy duties imposed on all goods passing through Ashanti, the ivory trade was driven away.

During the time I was in Quantampoh, caravans arrived from Timbuctu *via* the Moshi country and also Mandingos from the back of Sierra Leone. They brought articles of European manufacture, viz. cotton goods, knives, and thread. Caravans take great quantities of the kola nut from Quantampoh.

The only edifices built of mud are the mosques and the houses of the principal chiefs. The mud for building these is brought from some distance. In journeying from Coomassie to Quantampoh three small streams only are passed. They all run in an easterly direction, and none of them are more than four feet deep.

Prayers are offered twice each day in Quantampoh. Shortly after morning prayer the slaughtering for that day's meat consumption takes place. The cattle in this part of the country closely resemble those seen at the Gambia and Sierra Leone, having the hump on their backs, but they are larger than at either of those places, and are not confined to any one colour, like those brought from the Soo-Soo country. Coranza is the last place in which you are able to make any use of English money, and at this place the rate of exchange is very heavy. You get only about 12s. 6d. for 1*l.* sterling. Cowries now are the only currency. The principal merchandise offered in the market for sale came from France through the Gaman country.

During my stay in Quantampoh I was made aware of the fact that this market is much resorted to for the purchase of slaves. Although, during the time I remained in the town, I saw no slaves openly offered for sale, yet I sometimes accidentally intruded into the yards of some of the principal chiefs, and there found numbers of slaves, both male and female, chained together in batches of about a dozen, and awaiting purchasers. These people come from the east of Quantampoh and from the countries much farther in the interior. They are principally purchased by the caravans going north. The average price of a strong and healthy slave is from 2*l.* to 3*l.*

On one occasion, walking through the town at daybreak, I came on a gang of these slaves who were being marched off. They were in single file, following each other according to African custom. They were chained together; each one was carrying a load, and, apparently surprised at seeing me, they were hurried off as quickly as could be.

After the paper,

Sir SAMUEL ROWE said that an important part of his duties on the Gold Coast was to try to keep peace among the natives and promote trade. Formerly the Ashanti power overlapped the British possessions on either side, and stretching far into the interior, received tribute from places 200 miles beyond the borders of the Ashanti country. Access to the interior from the Gold Coast was barred by

Ashanti, which compelled all trade from the surrounding neighbourhood to go to Coomassie. So long as they had the power, the Ashantis allowed no native or European to pass from the coast to the north through Coomassie, nor from the north through Coomassie to the sea-coast. It was evident, therefore, that if the trade of the colony was to prosper and peace was to be secured it was necessary to find some means of rendering the colony independent of Ashanti. When he was Governor of the West Africa Settlements, his efforts had been directed towards inducing the people from the inland territories to bring their caravans down to Freetown. In this he had been so far successful that caravans had come to Freetown from Dingarawa and Balia and Segu and Bamaku. The British authority at Sierra Leone went but a short distance inland; but the French posts on the Senegal had been pushed on towards the interior until they now approached the navigable part of the northern course of the Niger. After the expedition of Lord Wolseley, Dr. Gouldsbury, in 1876, under the Government of Sir George Strahan, had travelled through Coomassie to Salagha, and since he (Sir S. Rowe) first assumed the government of the colony in 1881, he had persevered in the policy of attempting to establish communications with the interior districts which lay beyond Ashanti. Captain Lonsdale in 1881 and 1882 had gone as far as Yendi on the north-east and Buntaku on the north-west, and Captain Kirby had lately been allowed to pass through Coomassie to the very northern limit of Ashanti, where at Kontampo (Quantampoh), on the extreme confines of the Coranza district, he had met with a detachment from the caravan which comes down south on the one side from Timbuctu and on the other from Sakatu (Sokotoo). It had been long known that such caravans passed east and west along the northern boundaries of Ashanti. From Sakatu, the caravans pass on by Lake Chad to the eastward. Along this caravan route there is a constant stream of travel, Mahommedan pilgrims passing in some numbers to Mecca. He knew of at least two caravans that travel every year on the westward route between Morocco and Timbuctu. The fact that Captain Kirby met with European goods in the stores of the caravan which came to Kontampo (Quantampoh) from the north, showed that if free access were obtained from the coast to these trading caravans, a considerable business could be carried on. He thought that communication between the sea-coast of the colony and these interior trading routes should be encouraged. He was sure the result would be of advantage to British trade.

The PRESIDENT, in proposing a vote of thanks to Captain Kirby, said he was glad to hear that good results had followed the expedition to Ashanti, for it was not always that invasions of barbarous countries produced good effects. It appeared to him that the diminution of the Ashanti power was a beneficial thing, for that power was a cruel and barbarous one, and the fact mentioned by Captain Kirby that English influence had put an end to the wholesale sacrifice of human beings was sufficient to repay this country for the cost of the Ashanti expedition. He considered it impossible that English commerce would allow goods to be brought overland from Morocco or Tripoli through the desert when they might easily be conveyed from the Gold Coast to the interior if a secure route was obtained. The two towns of Kano and Yoruba had been called the Manchesters of Africa. They were towns of 30,000 and 150,000 inhabitants, and caravans from all parts met there, so that great exchanges took place, and all the materials existed for an extensive trade. No doubt, as peace was established and our knowledge of those countries increased, the sort of trade which led to civilisation would extend.

The PRESIDENT, in conclusion, said that with this meeting the session for 1883-4 terminated. He wished to add that Mr. Thomson was on his way to England, and that it had been hoped he would be home in time for the Society to hold a supple-

mentary meeting in order to listen to his account of his travels; but as he had to make his way from Zanzibar to Bombay, and thence to this country, he could hardly be expected to arrive at a sufficiently early date. He was, however, sure that the Society would meet in large numbers to welcome him at the opening of the session in November next.

Explorations in the Neighbourhood of Mounts Roraima and Kukenam, in British Guiana.

By HENRY WHITELY.

Map, p. 488.

My journeys to the extraordinary table-topped mountains, Roraima and Kukenam, in the interior of British Guiana, were undertaken in the course of the natural history explorations of the interior in which I have been engaged during the last five years. I had previously spent twelve years in the same pursuit in the province of Paucartambo, province of Cuzco, in Southern Peru, and returning to England, arranged in 1879 to visit British Guiana, with the object of making as perfect a collection as possible of the birds and insects of that interesting country. My instructions were to leave the coast and get into the forest country below the rapids, making my headquarters either at Bartica Grove Mission, on the Essequibo river, or in the vicinity of the penal settlement on the Mazaruni. These I carried out by taking up my residence at Bartica Grove, and here and in the surrounding district I was occupied up to February 1881, by which time I had succeeded in obtaining 200 species of birds.

The following is a brief account of my various excursions in the far interior:—

Having purchased stores and engaged boat hands, I left the Grove in March 1881, and reached Camacusa, a place on the Mazaruni just above the mouth of the Merumé river, in the same month. I collected in this locality till April 24th, 1881, obtaining many interesting birds, not found at Bartica Grove. Leaving Camacusa on April 27th, 1881, for a long journey beyond the Merumé Mountains, I travelled up the Merumé river, reaching the landing whence it was necessary to make the ascent, in the afternoon of April 30th. Unfortunately it rained heavily on the mountains that night, and the river came down in a tremendous volume in the early morning of May 1st, nearly spoiling all my provisions, and filling my tin boxes. This accident delayed me two days.

After my ascent of the mountain, and arrival on the other side of the Upper Mazaruni just above Chichi great falls, I met with a serious accident, which nearly put an end to my explorations. Having opened some of my powder-flasks and found the powder wet, I foolishly set to

work to dry it in a tin saucepan over a slow fire. I had got about twelve flasks dry, when unfortunately about half a pound of it exploded, burning me badly about the face and hands and half-way up the arms. I remained in great suffering here for five days, and then determined to get on to some Indian huts, distant about 17 miles. I did the journey in one day, the Indians behaving splendidly, carrying me part of the way, and passing me from hand to hand above their heads when it was necessary to cross a river, those in the middle of the river being nearly up to their necks in water. On arriving at the huts I was tended by a creole of the colony, Mr. James Ashby, till I got well, which was in about a month.

In the forests and on the savannahs in the neighbourhood of these huts my collection marked Merumé Mountains was formed, and it was here that I had the pleasure of discovering two very beautiful new humming-birds, *Lophornis pavonius* and *Heliodoxa xanthogonys*, besides many other new species of birds. I made a journey to George-town with my collection in the latter part of August of the same year, 1881, and after despatching it to England, made preparations for my first journey to Roraima.

Leaving Bartica Grove for this journey on September 14th, 1881, I reached Camacusa on the 24th, and was busy till the 19th October, arranging packages and getting Indians to act as porters for the overland journey. This was successfully performed, and I returned to George-town in August 1882 with my collection, and sailed for England, arriving about the middle of September.

On my collection being examined in England it was found that although it was a very fine one, and that some of the species were new to science, there were still some birds obtained by Schomburgk that were desiderata in many collections not only in England but on the Continent, and I resolved to return and obtain them, leaving England for that purpose on the 2nd November in the steamer *Roraima*. After an absence of fifteen months in the interior I returned to George-town, and again embarked with my collections for England, arriving on the 26th June last.

I will here relate an incident which illustrates the sterling character of my faithful Indian companions. On the way down from Camacusa, in passing certain rapids, my boat touched on a rock and turned nearly over, pitching myself and some of the Indians into the strong current. Being unable to swim, I was saved from imminent death by the devotion of my Indians, who swam alongside me and sustained me in the water till the others could bring the boat down to our relief.

In conclusion, I may say that the results of this last expedition have proved highly satisfactory. I obtained all the species of birds that were wanted, besides many others previously unknown. The total number of species now obtained by myself in British Guiana will amount to upwards of 400.

I.—JOURNEY TO KUKENAM.

Having found the ascent of the Merumé Mountains from the banks of the Merumé river very precipitous on my former journey, in May 1881, I resolved to try to reach Roraima, by way of the Curubung river, and thence up the Cako, a tributary of the Upper Mazaruni. I left Camacusa, a place on the river Mazaruni, a little above the mouth of the Merumé river, on the 19th of October, 1881. My party consisted of eight Indians in my boats, besides other Indians, embarked in their "woodskins" (canoes), to act as porters for the journey overland. Paddling up the river, we reached the mouth of the Curubung on the evening of the 20th of October.

Starting early in the morning of the 21st, we entered the Curubung, the scenery of which was beautiful, with the mountains in the distance ahead. This river is not very wide at this season, and follows a very tortuous course. In the afternoon we arrived at two huts in a small clearing, about half-way up to the place where we should have to leave the boats. Here I was compelled to stay three days on account of the Indians having to hunt up more porters for carrying purposes.

Leaving the clearing early on the morning of the 24th, I reached the landing-place about 1 P.M.; here we were detained some time unpacking the boats and arranging the loads for the Indians. I also sent back the boats to be left in charge of the Indians at the clearing till my return. The ascent of the mountains from this side was very gradual to the height of about 900 feet, and then the path was over almost level ground for some distance, and this continued all the next day with very little ascent, and that gently sloping, crossing many small streams, till about 10 A.M. of the 26th, when we had to ascend the mountain to a height of over 2000 feet; and then, descending a little, we came to a small clearing, from whence a splendid view was obtained of the surrounding country.

After passing this the descent was very abrupt for many hundred feet, till we reached a small river, which we crossed.

On the 27th our way lay through the most beautiful country I had yet seen in British Guiana, and we arrived about 8 A.M. at the river Membaru, where, unfortunately, the Indians could only find two small canoes, and it was necessary for me to wait here till late in the afternoon, whilst they were making journeys to and fro to take on my equipage. About 5 P.M. I embarked in a small canoe with one Indian, and my Indian servant Thomas Gill, who had accompanied me on my former journey to the Merumé Mountains, and whose enthusiasm in the discovery of strange birds has been of great service to science; for although it is true that, had I not made these journeys, the new species inhabiting the forests of Merumé and Roraima would probably not have seen the light for many years to come, still, without the dexterity of the

Indian in penetrating the dense forest and finding his way out again, little could have been done.

After a tortuous course, the difficulties of which were increased by the innumerable dead trunks of trees in the stream and the overhanging branches, we came to clear water, and had to run down a small rapid, at the foot of which, as it was now dark, I found all my Indians waiting my arrival with firebrands in their hands, and shouting to me to make for the shore where they were posted, as the river a little further on, rushing over large rocks, formed a respectable cataract called by the Indians "Arrawatawick." There was a path here overland to the foot of the cataract, and here I found my people had set up my tent and prepared food for me. They were laughing and chattering nearly all night, some of them being out fishing below the cataract; this, combined with the noise of the rushing water, the camp-fires, and the wild scenery, caused a feeling of delight never experienced in a crowded town or city.

Early on the morning of the 28th I made arrangements with some Indians, who were encamped in the neighbourhood, for the hiring of eight canoes, and paddling rapidly down the Membaru, we entered the Upper Mazaruni below the entrance to the Carimang river, about 1 o'clock P.M. During the journey overland my Indians had persuaded me that it would be preferable to reach Roraima by going up the Carimang (which, by the way, the Indians call Camurang), as the Cako was very shallow and full of trunks of trees, more especially as it was now the dry season; and, according to them, we were to enter another river on the left, coming down from the high mountains in the vicinity of Roraima. They told me that, some years before, a white man had gone to Roraima by that route, but I could learn nothing further about him.

The Upper Mazaruni at this point is a large river, and flows on smoothly. Paddling up stream we passed several rapids, in going up one of which one of the woodskins split across, and with difficulty the Indians succeeded in getting my boxes to the shore, the canoe going down in deep water. Leaving two Indians in charge of the boxes, I went on and entered the mouth of the Carimang about 5 o'clock P.M., sending back afterwards one of the canoes to bring up the two Indians and my boxes.

Leaving early the next morning, we paddled up the Carimang, which is a fine river, but follows a very tortuous course, so much so that in one place we saved nearly half a day's paddling by unpacking the canoes, and carrying them overland for about 150 yards, coming out again on to the river. Looking down the river from this spot, I saw a high mountain, the foot of which came down to the river, evidently causing it to deviate so much from its course.

The river appears to be thickly populated, as we passed many landing-places, where the Indians were awaiting my arrival (having

learnt of my coming from some of their countrymen, who had gone on ahead) to barter yams, cassava bread, plantains, &c., for beads and blue cloth. At one of these landing-places, I engaged more Indians, as carriers for the provisions I had bought, as I was in doubt whether I should get a supply at Roraima, and rested at the same place till Monday.

The Ackawoise Indians, who inhabit the Mazaruni and its tributaries, generally reside a long distance from the banks of the river, near some small stream of water, and for this reason it is impossible to arrive at any exact calculation of the population of the district.

Starting from the landing on the 31st, accompanied by 29 Indians to act as porters, I journeyed on up the river Carimang, the current of which was very rapid, and the river making many contortions. I did not reach the Atapurau, which comes in on the left going up, till 2 o'clock of the afternoon of the 1st of November. It is a fine river with a very strong current, and comes down from the mountain Eleutewer, one of the mountains on the elevated plateau near Roraima. This river is not marked on any map, and being of tolerable size, it is of importance, and I believe I can claim to be the discoverer. At 11 o'clock A.M. of the 2nd we arrived at the last Indian hut, just below some rapids, up which we had to haul the canoes, and soon after passed the mouth of a small river called Cutaqua, coming in on the right, finally arriving in the afternoon at the landing on the right bank just below a large fall. A small creek at the landing-place, coming in on the right, is called Attacumen.

Very few birds were seen during the journey overland and up these rivers; there were a few kingfishers and cormorants, and the common ibis (*Ibis falcinellus*). I heard many thrushes singing in the forest, and occasionally the bell-bird (*Chasmorhynchus niveus*). We also shot a large Muscovy duck on the river.

Early on the morning of the 3rd we commenced to ascend the mountain, and arriving at the top, about 2500 feet above the sea level, had a long walk through dense forests, till, at 1 o'clock P.M., we came out on the open savannah. What a glorious view!—hill above hill stretching away to the west, and open savannah and wooded hills on the left, with the great Eleutewer mountain right ahead.

We passed along the banks of the Carimang river, which is here about 30 feet wide, for a short distance, and then walked on over the savannah, crossing many small streams, some of them rapid and very deep. At one of these we were detained for some time hunting the capybara, called by the natives water-haas, after the name given it by the Dutch colonists, and shot two of them, the flesh of which we found very good eating. About 5 o'clock P.M. we entered a large wood, and, traversing this for some distance, came to a river of moderate size, which my Indians called Waurpa. Crossing this over a large fallen tree, we camped for the

night. Though in the day-time it was pleasant travelling, the nights were very cold, and I was glad to have a small wood-fire lighted under my hammock.

On the 4th our journey in the earlier part of the day was over the open savannah till we came to a small stream of water, crossing which the path entered the forest, and we toiled up a steep hill for about 500 feet—the underwood in places being very dense—and coming out again to the open savannah, in a short time obtained a view of the curious mountain Kukenam. To these two mountains, with their wonderful precipitous sides, the natives generally give the one name Roraima Mountains, but on inquiry of the Indians living in the immediate neighbourhood, they told me one was called Kukenam and the other Roraima. I had with me 30 Indians, all walking in single file, myself bringing up the rear, and thus we tramped on for miles and miles over the savannah, till at last, at 4 o'clock P.M., we reached the banks of a river called Cama, crossing which we camped in a small wood.

The paucity of animal life seen on these journeys is astonishing, and it is only after remaining some time in a locality that the number of species inhabiting it is discovered, much to the astonishment of the traveller, who has perhaps not seen a dozen birds during the journey.

Our march on the 5th was over the savannah, and then through a wood, after passing which the path over the savannah commenced to ascend for nearly 700 feet. After reaching the top we rested for an hour. To the west were seen fine savannah-lands and low mountains with wooded slopes. I turned out of the usual Indian path, as my people were very tired, and I wished to reach an Indian hut near Kukenam. We reached the hut about 6 o'clock P.M., having had to descend some hundreds of feet by a path strewn with small angular stones and pieces of rock, which obliged the Indians to put on sandals. We accomplished about 25 miles that day. Some of the Indians, having heavier loads than the others, did not arrive at the hut till the next morning, sleeping on the savannah.

I was busily engaged on the 6th sketching the mountains Eleutewer, Huya-gabya-pner, and Kukenam, and although I had no instruments for calculating the height, I reckoned the direct vertical sides of Kukenam to be about 1000 feet above the sloping part. I could distinguish trees on the top, but should not suppose them to be large, as the surface mould cannot be very deep, the rock appearing to go right to the summit. At this time I did not observe any waterfalls, but subsequently, after heavy rain, I counted twelve coming down from this side.

It seems impossible to ascend either this mountain or Roraima * except

* Mr. C. Barrington Brown, Government Surveyor in British Guiana, who visited this district in 1869, estimates the length of Roraima to be "about 8 or 12 miles, Kukenam perhaps more."—'Canoe and Camp Life in British Guiana,' p. 124. See also Mr. Sawkins' statement in Proceedings B. G. S. (old series) vol. xv. p. 131.—[Ed.]



SOUTH SIDE OF MOUNT KUKENAM. FROM A DRAWING BY MR. WHITELY.

by balloon, and this could only be done from the south side, on account of the strong wind constantly blowing from that direction. It might be possible to ascend by forming scaffolding, making use of the timber of the large forests on the slopes, but in this case it would be a work of time and great expense. A solitary traveller would perhaps be able to obtain a sufficient supply of provisions, but a large party would be forced to bring everything, for their sustenance with them, besides perhaps encountering opposition from the Indians, naturally jealous of the advent of any large party of strangers.

I left Kukenam on the morning of the 7th and walked on over the savannah, having to ascend a little, and about 11 A.M. reached the banks of the Yuruani, a very muddy river, with very little current at this spot, and not more than about 20 yards wide.

The Indians had here two canoes for ferrying over to the other side, and when we arrived we found them on the opposite bank; but this difficulty was soon overcome by some of the Indians swimming across and bringing them over.

After crossing the river we had to ascend through a wood, and, arriving at the top, passed on for some distance through savannah-land

to a small hill, on the summit of which we found three small huts of Indians. This spot I determined to make my head-quarters, as we were now near also to the other mountain, Roraima, which has much the same physical features as Kukenam, but I did not observe any forests clothing the top from this side, and the vertical portion of the mountain seems to be of rather lower elevation than that of Kukenam. A waterfall was observed coming right over the edge of the cliff.

The scenery round Roraima is very grand, but the country is sparsely populated, the families of Indians living very far apart. They make their fields on the slopes of the hills, planting cassava, bananas, plantains, yams, and sugar-cane; and they supplement their supplies by hunting the paca, accouri, and deer, of which latter there appear to be two species. They also fish in the river Yuruani, some of the fish obtained measuring from 6 to 18 inches in length.

Rain was constantly falling on Roraima and Kukenam during the greater part of my stay in that neighbourhood, and for days together the mountains were enveloped by clouds; at times, when it cleared, and the sun was shining, the deep-red colour on parts of the vertical sides, standing out as they did from the sombre-coloured forest on the lower slopes, was seen to great advantage. Not being a geologist, I can say nothing about the different strata, but in my opinion these mountains were never islands in the sea, as some have supposed, the curious appearance of the surrounding country, with its hills and dells, giving rather the idea that the whole had been caused by volcanic agency.

II.—ASCENT TO THE FOOT OF THE VERTICAL CLIFFS OF RORAIMA, AUGUST 1883.

From information received from the Indians as to the difficulty of getting, elsewhere, leaves for thatching, and it being necessary for me to have a large hut for the depositing of my collections of natural history, I determined to make my head-quarters on the same spot in the neighbourhood of which my first collection was formed, in the latter part of 1881 and the beginning of 1882; this is distant from Roraima about eight miles in a bee-line. Reaching this spot on the evening of March 30th, 1883, I set to work on the following morning, with the twenty-five Indians who had accompanied me, getting up the framework of a hut, and in three days had the dwelling thatched. Here I remained collecting with my Indians for some months, till, finding the birds were in splendid plumage—which was of importance to me, the principal object of my mission being to obtain some birds of which only one specimen was known in European collections, and which were said to come from the slopes of Roraima at an elevation of 6000 feet—I at last determined to make an expedition to the foot of the vertical portion of Roraima.

I left my hut at 7 A.M. on the morning of August 2, 1883, accompanied

by my Indian collectors, Joseph and Henry Manuel, and Cafre my Indian boy (since dead), John Andrew as interpreter, and seven Indian porters, leaving the huts and collections in charge of two Indian women. We travelled in an easterly direction towards Roraima, over hill and down dale through the most delightful scenery, savannah-land, with the sides of the hills and bottoms of the dells clothed with wood, and dense forests lying on the left towards Kukenam—in fact, continuing in an unbroken line up to the foot of its precipitous cliffs.

We crossed the small rivers Cerima and Comique, tributaries of the Yuruani, running north, continued the journey through the forest and crossed the latter river again, which must take a very tortuous course as it was then running south. I camped early, as the Indians wished to hunt in the forest at the foot of a chain of hills called Cymaripeer; this is evidently a spur thrown out from Kukenam and continues many miles in a southerly direction.

On the following morning I continued my journey and ascended the hills. On reaching the top I found we were close to the south end of Kukenam, Roraima lying due east. From the top of this chain of hills we had to descend a little to two Indian huts, the inhabitants of which turned out and saluted us with volleys from their guns, inviting me at the same time to rest for a while at the huts. At 11 A.M. I continued my journey, following the Indian path along the foot of Kukenam till I reached other Indian huts at the foot of Roraima. The Indians here told me that it was better for my purpose to stay on the savannah and to make expeditions up the slope to Roraima, and they gave up two small huts on the other side of Kukenam river for my use. On crossing the Kukenam I found it had no great depth of water at that season, but it was dangerous to cross on account of the river being full of boulders of various sizes, those under water smooth as glass, affording a very precarious foothold. From inquiries I found that it was a formidable river during the rainy season, and at times impassable. This river takes its rise on the flat summit of Kukenam Mountain, flowing over the top of the vertical portion, and having a descent of nearly 2000 feet to the forest growing on the lower slopes. There was very little water flowing over when I passed, and it came down in the form of mist, and at times during my stay entirely ceased to flow. The savannah-land at the foot of Roraima is covered with immense boulders and smaller pieces of sandstone. These have evidently at some remote time broken away from the face of the rocks, and although I made inquiries amongst all the old Indians, some of whom had been in the service of Sir Robert Schomburgk more than 40 years ago, not one of them had ever seen a part of the rock break away, and they told me they must have fallen ages ago, for they have no record of any such circumstance from the tales of their ancestors.

The bearings of the mountains from the Indian huts on the savannah



MOUNT RORAIMA, FROM A DRAWING BY MR. WHITELY.

are: Kukenam, N.; Roraima, N.E. by E.; Waetipu, away in the distance, S.E. by E.

I left the huts at 6 A.M. on the morning of the 5th of August, with a party of nine, all told, to reach the foot of the perpendicular rock. We passed through long grass in the early part of the morning, and then ascended grass-covered slopes, which were thickly strewn with boulders; the land was swampy just at the edge of the forest clothing the precipitous sides.

We entered the forest at 9.35 A.M., and commenced to cut a path to reach the rocky precipice; it was the densest underwood I ever passed through, and it was very laborious cutting a passage with large knives. The slope appears to have been formed by the rock breaking away from the sides of the mountain, and trees were growing in every crevice between the boulders. After ascending to a height of 6000 feet we came to brambles and prickly bromelias, which played havoc on the naked bodies of the Indians, and my hands were full of spines from making the mistake of grasping them to hold on by and swing myself up over the boulders. However, the gallant Indians toiled on, gradually approaching the foot of the cliffs, which we had the satisfaction of reaching at 1.30 P.M. I here took observations with aneroid, and boiled the thermometer on a small ledge of the rock itself, finding the height reached to be over 7000 feet.* A heavy shower of rain came on shortly afterwards, and thoroughly drenched us. After it passed I broke off some of the rock with a hammer, and this I have brought home with me, and it will be submitted to Professor Bonney for examination. On the rain and mist clearing off we had a fine view of the country to the west, one mountain in the distance being conspicuous from its height, which must nearly equal that of Roraima.

We left the foot of the rocky cliff at 2.30 P.M. to return, as I was anxious to reach the huts on the savannah, the Indian boys having shot me many interesting birds with their blow-guns; we reached the grass-covered slopes at 4 P.M., and, descending rapidly, arrived at our huts at 6 P.M.

I had observed on this journey a spot where the vertical cliff had broken away, and as it seemed to be the only place, from the accounts given me by the Indians, that, by any means short of going up in a balloon, an attempt could be made to reach the summit, I made arrangements with the Indians to endeavour to cut a path to the foot of it, and on September 4th I sent up a party of them to commence operations, which were finished by September 9th.

On the morning of September 10th I left the huts on the savannah with a party of 14 Indians, men and boys, and, ascending to an elevation

* The mean of Mr. Whitely's observations taken at this station I find on computation gives an elevation above sea-level of 7759 feet.—(JOHN COLES, Map Department R.G.S.).

of 5500 feet, camped in the forest. The following morning, by observations made before entering the forest and those made on reaching the rock, I found the height of the forest-covered slope to be 1375 feet. I found on entering the forest that the Indians had cut a wide path, and we got on pretty fast in the ascent, but a dense mist came on, and it was impossible to distinguish anything a few yards off, and on arriving I found that we were stopped by an enormous rock with precipices on both sides. Looking up I could distinguish through the mist trees and shrubs growing on the top, and it could have been but a little way removed from the cliffs of Roraima, as I found on boiling the thermometer. I am afraid that the path had not been cut in the exact direction of the break in the cliff, and that we never reached the place. Finding we could do nothing on account of the dense mist, after detaching some of the rock, which was moss-covered, we returned to our camp below. The cold was felt by us all, more especially as the forest was very wet, and all my clothes and boots were saturated, as though heavy rain had fallen on us.

I was sorry not to have been able to ascend this sloping portion of the rock to the break, which is about half-way up, as I wished to examine the place, which I judged would have to be bridged, as after the break the ascent appeared to be easy, and the top could, I fancy, be reached without much difficulty. From information gleaned from the Indians who had accompanied Schomburgk, he also expressed the opinion that the precipice half-way up would be an insuperable difficulty in the ascent. It might, however, be overcome by taking ropes and all necessary implements, under direction of some one skilled in overcoming difficulties of a like nature. The expense would probably be great, as it would be necessary for a large party to camp at the foot of the forest-covered slopes, and open up a broad path to the vertical rock, round which there is not space sufficient to set up a tent—a very necessary precaution at that height, on account of the low temperature. A mere ascent of the mountain for one or two days would be of no use to science, as from its great extent it would take a long time to collect the natural objects, not only in zoology, but also in botany.

GEOGRAPHICAL NOTES.

Return of Mr. Joseph Thomson.—Mr. Thomson arrived in England by overland route from Brindisi on the 20th of June. He was still suffering from the illness contracted on the borders of Lake Naivash, in the Masai country, and after three days' stay in London proceeded to his home in Dumfriesshire. A few weeks' much needed rest will no doubt restore him to health, and the members of the Society may expect to

hear from his lips, on the opening night of the next session in November, an account of the wonderful journey he has performed. He has brought his route-maps with him, but his journals, photographs, and collections are coming round by sea. His maps, at first sight, show that a very considerable alteration will have to be made in the outline of the north-eastern coast of Victoria Nyanza. It is here, nearly in the same latitude as Uganda and the outlet of the Nile and not further south, that the populous coast-country of Kavirondo is situated; and Lake Bahringo lies inland in a deep meridional trough, to the east of Kavirondo. The preliminary sketch we gave last month (*ante*, p. 400) founded on the best existing maps is, therefore, very erroneous. Among the photographs is one of Mount Kenia, taken in early morning, the only time at which the lofty peak is free from clouds. It represents a cone of snow, some thousands of feet in elevation, rising from a broad basis of forest-clad lower slopes. The practical result of the expedition is likely to be the opening up of a new direct route from the Indian Ocean to the northern side of Victoria Nyanza, viâ Ukambani and Kavirondo, with Mombasa for the starting-point.

Mr. Johnston's Expedition to Kilimanjaro.—Mr. Johnston commenced his march from Mombasa on the day preceding Mr. Thomson's arrival there, and their caravans passed each other without meeting. Mr. Wakefield reports that Johnston on leaving his station at Jomvu for the land journey was in need of nothing, and had suffered none of the usual inconveniences from desertion of men which African travellers have always to experience at starting. He had had, however, an attack of fever at Mombasa, and thus commenced his journey under some disadvantage. Lieut. Gissing, R.N., British Vice-Consul at Mombasa, left for a journey into the interior about the same time. Mr. Thomson in coming down found famine prevailing in the Teita district, on the road to Kilimanjaro.

Proposed Journey across the Usambara and Nguru Districts of East Africa.—In June last Mr. C. Stokes, of the Uganda Mission of the Church Missionary Society, was at Mombasa preparing for a journey across the interior to the south-west from Mombasa to Mumboia. Mr. Stokes is an experienced East African traveller, having several times made the journey to Victoria Nyanza and back, he is therefore likely to succeed in this new undertaking. His route will lie for the most part through a difficult country of mountains and forest, inhabited by tribes of uncertain temper.

Portuguese Expedition to the Muata Yanvo.—A Portuguese Government expedition, under the leadership of Major Henriques de Carvalho, left Loanda on the 10th of June last, on a mission to the Central African potentate the Muata Janvo, whose country was first visited and made known to Europe by a Portuguese traveller, Joaquim Rodrigues

Graça, in 1845-7, and has since been further explored by the German travellers Pogge and Buchner. The new expedition went by the *Serpa Pinto* steamer to Dondo on the Quanza river, and will commence the land march thence viâ Malange as soon as the requisite number, 400 to 500, of carriers can be obtained. They take important presents from the King of Portugal, and will endeavour to open up the Muata Yanvo's dominions to commerce, afterwards crossing the continent to Mozambique.

Rescue of Lieut. Greely and Five Members of the American Polar Expedition.—The steamers *Thetis* and *Bear*, of the Greely Relief Expedition, arrived at St. John's, Newfoundland, on the 17th of July, bringing six survivors of the unfortunate expedition which has passed three winters without succour from the outer world, in Smith Sound. The rescued members happily include the leader himself, and it is satisfactory to learn that the journals and observations have also been saved. We learn from the telegrams in the daily papers that the expedition passed the first two winters without loss or serious inconvenience, but the summer of 1883 wearing away without signs of arrival of the relieving ship, and their provisions growing short, the entire party of twenty-five deserted their house in Discovery Harbour on the 9th of August. They failed, however, to reach the Danish settlements in Greenland, and were obliged, on the 21st of October, to encamp off Cape Sabine, on the western side, near the entrance of Smith Sound. Here they remained throughout the dreary winter, with no other shelter than hastily constructed snow-huts, and living on what they could find of the stores left in the neighbourhood by Sir George Nares in 1882, and by the relief ships of 1882 and 1883. These supplies exhausted, they warded off starvation for some time by devouring their sealskin clothing and lichens collected on the few rocks projecting above the snow, aided by an occasional seal or a few shrimps obtained from holes in the ice. But hunger and hardship soon reduced the original number of twenty-five to seven. Dr. Pavy was one of the last victims, his death happening on the 16th of June, only five days before the relief party arrived.—The rescue of the survivors appears to have been accomplished with great skill and gallantry. The passage across Melville Bay in the early summer had been exceedingly slow and dangerous; the *Thetis* "rammed her way from lead to lead for hundreds of miles among the ice-floes." On arriving at Brevoort Island parties were sent to search for records and cairns, and one was luckily found on the highest point, deposited there by the Greely party in October 1883, and stating that they had established their winter camp near Cape Sabine, and had only forty days' rations. All the search parties were immediately recalled, and the launch of the steamer *Bear* was despatched with all speed to the place indicated, returning soon afterwards with the tidings that seven only of the party were alive, and that Lieut. Greely and two of the survivors

were dying. Further succour was carried by Captain Schley and other officers, and the sufferers were carefully transported to the *Thetis* and *Bear*, and tenderly cared for. When found, Lieut. Greely was just able to support himself on his hands and knees: on either side of him lay one of his companions, both in a dying condition; Corporal Ellison, with both feet frozen off, unable to raise his head, and Private Connell in a sleeping-bag, dying of starvation. A small quantity of milk-punch and ammonia strengthened them, and some beef-tea and warm milk were added. Their pleadings for food were heartrending, but all solid food was refused them. Serjeant Ellison lived for some days, but died on the 6th of July, after the amputation of his frozen feet.—As the records of the expedition, the most unfortunate of all those sent out in 1881 and 1882, under the scheme of the International Polar Stations for Scientific Observation, have been saved, the departments of science, magnetism and meteorology, on behalf of which they were chiefly organised, will undoubtedly benefit, though the gain is pronounced by American public opinion very dearly bought. In geography, the expedition, according to the telegrams, has accomplished noteworthy results. One of these is the attainment of a higher latitude than that reached by Captain Markham in the English Expedition of 1875–6. This feat was achieved by Lieutenant Lockwood and Serjeant Brainerd on May 13th (1882?), who reached an island off the north coast of Greenland, in lat. $83^{\circ} 24'$, long. $44^{\circ} 5'$. * From the summit of the island, 2000 feet high, they saw no land to the north or northward, but to the north-east a cape, which they named Robert Lincoln, in lat. $83^{\circ} 35'$, long. $38^{\circ} 82'$. Lockwood and Brainerd also, in 1883, succeeded in crossing Grinnell Land from the head of Archer Fiord, reaching the head of another fiord on the west in lat. $80^{\circ} 30'$, and long. $78^{\circ} 30'$. A cape some 70 miles distant out at sea was seen from the head of this western fiord, and seemed to be separate land from Grinnell Land. Lieut. Greely seems to be of opinion that the coast of Greenland turns south a little beyond Lieut. Aldrich's farthest in 1875–6, and runs westward to the fiord discovered by Lockwood and Brainerd.

Mr. Holt S. Hallett's Expedition.—We learn from a telegram in the *Times* of the 24th of July that Mr. Hallett's expedition through the Shan country † has returned to Bangkok successful. His journey through North Siam to Bangkok occupied five months and thirteen days. He surveyed over 1500 miles of route, determined the position of the Shan ranges, and brings back vocabularies of the aboriginal races and notes on the histories of the several Shan States. A mass of information throwing light on the interior of Indo-China, especially of North Siam, was gathered. Mr. Hallett has suffered much from fatigue and exposure and

* Captain Markham's farthest, it will be remembered, was $83^{\circ} 20' 26''$ N. This was about 20 degrees of longitude to the west of Lieut. Lockwood's farthest point.

† Vide 'Proceedings,' April No., *ante*, p. 220.

intends soon to return to England. His companion, Dr. Cushing, was compelled on account of illness to return at an early stage in the journey.

The late Volcanic Eruption in the Straits of Sunda.—Sir John Kirk, writing from Zanzibar on the 9th of June last, says, "There is a vast amount of pumice-stone being cast up here; the beach is littered with it for miles. I presume it has drifted across the Indian Ocean from Java, a product of the eruption of last year. The fact of its being cast up here at this date may be worthy of record in connection with other observations."

Island of Diego Garcia.—In the March number of the 'Proceedings,' 1882, we gave a short description of this island taken from the 'Hydrographic Notices' of the Admiralty. The name of this island, as we are now informed by our Associate Mr. Jas. Forrester Anderson, of Mauritius, was the subject of an interesting paper read by the late Dr. Régnaud before the Royal Society of Mauritius in 1858, and published in the Transactions of that Society for 1859. The island is one of the dependencies of Mauritius, from which it is distant about 800 miles. In an article on the nomenclature of the islands of the Indian Archipelago, published in the volume of 'L'Univers Pittoresque' for 1848, Mr. D'Avezac draws attention to the errors made by the earliest cartographers and continued from one generation to another in the names of some of these small islands. He explains that it is by corruption that we say in our days Astove, Peros-Banhos, Amirantes, Cargados, Carajos, &c., and shows that the real names of these are As doze ilhas (the twelve islands), Pero dos banhos, Ilhas do Almirante (Islands of the Admiral), and lastly, Coroa dos Carajao, &c. The celebrated geographer does not, however, mention the Island of Diego Garcia, although it is one of the group that attracted his notice. Dr. Régnaud believed that the real name of the island is Don Garcia, but to what navigator it owes its name he had been unable to find out. Dr. Régnaud here observes concurrently with this fact, that with regard to Mauritius itself the name Cerné has been the subject of no little speculation, and that among the many etymologies given, the one proposed or suggested by Mr. D'Avezac has been left out. "The same thing may perhaps be said of O'Cerné (the name of a well-known Portuguese family) to which the Dutch have preferred the name Mauritius." The most ancient maps on which Diego Garcia is marked, are those of the 'Orbis Terrarum' of Ortelius, 1571; it is marked Don Garcia in a reduced map of the world, and in one of Asia Minor. It is found also in that name (Don Garcia) in the 'Universal Cosmography' of André Thavet, 1575, and in the 'Cosmography of Munster' revised by Belleforest, 1575. From this period the name is changed: thus, in a collection of travels of the Dutch Company, published at Paris in 1598, the island is marked Diego graciosa. It

bears that name in the 'Adventures of the voyage of John Davis,' 1605; whilst Hondrius in the following year describes a group of small islands either for abbreviation or for prudence sake, as *Ilhes digo*. The maps of Gérard Mercator of 1613, and of Linschot, 1619, bear respectively the names *Don Garcia* and *Diego gratiosa*. One would think that the last name (*Diego gratiosa*) was introduced with great difficulty in the more recent maps, for if the editions of Hondrius and P. Bertius published in 1640 give *Diego gratiosa*, others, such as the "Plan of the World" of Blaen, published in 1647, corrupt the name by substituting a *c* for the *t*, of *gratiosa* it makes *graciosa*, as if to draw the name closer to the first word *Garcia*: and the cartographer of Robert Dudley in the same year (1647) in the '*Arcano del Mare*,' puzzled in the choice he has to make, calls it alternately, *I. di Diego Grazia*, *I. de Diego gracia* or *graciosa*, and, lastly, *I. de grazia*. It is very difficult to say how far this corruption has extended: a map of Philippe Buache, 1700, bears *I. de gratia dios*, and another, Guillaume Delisle, 1714, *Divina gracia*. The island appears as *Diego Garcia* for the first time, on a map of João Texeira (Lisbon, 1649) and reproduced by Thévenot. Guillaume Delisle himself, from the year 1720, describes it by no other name in the various maps he published, and the more modern maps retain the name definitely, with the exception, however, of an atlas of Sanson, 1733, in which it is marked *Diego Bracia*.

CORRESPONDENCE.

The Identification of the Pinarus with the River Piyas.

RAVENSCOURT VILLA, HAMMERSMITH,
June 11, 1884.

SIR,—Will you kindly allow me to make one or two observations in respect to Sir Charles W. Wilson's identification of the Pinarus with the river of Bayas (or Piyas as he writes it) in contradistinction to the view advocated by myself in the eighth volume of the Journal of the Royal Geographical Society, of the identification of that river with the Deli Chai?

The identification in question appears to have been adopted by Sir Charles Wilson on account of Arrian having made mention of the delight experienced by Alexander when he found that Darius had moved from the broader into the narrower part of the plain.

But it may be permitted to observe that this would have applied to his leaving the plain of Urzin (whether of Issus or of Epiphanea) below the Amanian Gates, rather than to his advancing on the plain beyond the Deli Chai to the river of Bayas.

This latter plain is intersected by narrow, deep, and impassable fissures, cut by mountain torrents in a clayey alluvial soil; and as these are the beds of rivers, with perpendicular sides, although dry at times, they must have existed from the most ancient times. They may have been overlooked by Captain Bennet, as they join the main streams before reaching the high road near the sea, but I have been obliged to retrace my steps for a long distance before I could reach the high road, by one of

these nullahs. This is not the case with the plain of Urzin, which I have hunted badger over for miles without meeting an interruption.

It is quite true that the plain north of the Marble or Syrian Gates widens out northwards until it attains its greatest width at the point where the Deli Chai and its tributaries cross it. But the plain beyond this, to the westward, at the head of the Gulf of Issus, by Kara Kaya to the Cilician Gates, and northwards by Guzeneh to the Amanian Gates, is far more extensive than the plain of the Deli Chai, and, although this plain has also its rivulet, it is not cut up by impassable fissures like that of the Deli Chai. It is more elevated and stoney, and has more vegetation than the plain between the Deli Chai and the river of Bayas. It is also dotted with ruins, which is not the case with the latter plain. As the battle is called by the historians "the battle of Issus," the probabilities are in favour of a northerly site.

Cyrus is described by Xenophon as marching 15 parasangs, or 45 miles, from the Pyramus to Issus. This would correspond to the distance from that river to the plain of Urzin or to the Deli Chai. Then again, Cyrus made in one march five parasangs, or 15 miles, to the gates of Cilicia and Syria. That is the distance from the Deli Chai to the pass at Kersus, whereas it is only five or six miles from that pass to the river of Bayas. It is therefore evident that Issus, at that time "a large city, rich and well situated," could not have been at Bayas, but must have been situated at or near the Deli Chai, most probably on the plain of Urzin. Arrian describes Darius as crossing the mountain by the pass called the Amanian Gates, the Baghchi or Tchordan Kalehsi pass, both meeting at Asmaniyah and Toprak Kaleh. Hence he marched upon Issus, and thus placed himself in the rear of Alexander, who was ignorant of his movements. Next day he advanced to the Pinarus. Issus was therefore not on the Pinarus, whether represented by the Deli Chai or the rivulet of Bayas, but between the river and the Amanian gates.

Alexander, after returning from Myriandrus, at the foot of the Bailan Pass, to the Marble Gates by a night march, descended, according to the same historian, with the dawn, from the gates, along the road, and as long as the pass was narrow he led his army in columns, but as the defile expanded, he regularly formed his column into line by bringing up his heavy armed troops successively to occupy the vacant space between the main column and the mountain on the right and the sea on the left.

This must have been, therefore, before reaching the river of Bayas. But, granting even that the battle began on that river, it would not constitute it the Pinarus, as Issus was at or nigh that river, and Issus was 15 miles from the Marble Gates, whereas the river of Bayas is only five or six. It is possible and probable, then, that Darius on his side advanced beyond or south of the Deli Chai or Pinarus to give battle, while Alexander, on his, opened or deployed from column into line as the country expanded towards the river of Bayas; but in all probability the two opposed forces did not meet till on the plain between the river of Bayas and the Deli Chai. Had the river of Bayas been the Pinarus, Darius would, to have reached that river, have had to march in one day 20 miles, instead of 10 or 15, to the Deli Chai. There is only a distance of from five to six miles between the two rivers or their tributaries, and there is about the same distance to the Kersus. Had the battle taken place, then, half-way, that is at the river of Bayas, such a fact would not have constituted that river the Pinarus. It is a mere rivulet, whilst the Deli Chai, or "mad river," after receiving the Koi Chai, or "village river," becomes a really small river. The battle was called, as before said, the battle of Issus, on the Pinarus, which is the river nearest to Issus. In all probability Darius, having reached the Pinarus, would have moved in advance, resting his forces upon the river and its tributaries. His light Parthian horse could not then have acted on Alexander's

right from the ravines that cut up the ground, and hence the Macedonian's delight that Darius had moved from the broader into the narrower part of the plain. Had the Persian host moved in front or southwards of Bayas, not only would there have been no room for the Persians to have utilised their large force, but, as they would have taken up half the distance to the Kersus, there would have been no room for the Macedonians to deploy from column into line. This, then, constitutes another objection to the identity of the Bayas rivulet with the Pinarus, superadded to the question of distances, of the peculiarities in the movements of the hostile forces, and of the vicinity of that river to Issus. If the Bayas rivulet represented the Pinarus, we should expect to find in the neighbourhood remnants of Issus or of Nikopolis, the "city of victory," which rose upon the field of battle, or of the altars raised, according to Quintus Curtius (lib. iii. ch. xii.), by Alexander to Jupiter, Hercules, and Minerva, and which are mentioned by Cicero in his Epistles, and by Herodian in his History. But there are few relics of ancient times at Bayas, whilst on the plain beyond the Deli Chai are the extensive ruins in basalt near Urzin, the ruins at Kara Kaya, or the black rock, many fragmentary remains on the river itself, and arches of aqueducts and other relics on the way to the black or iron gate. The details of these various ruins are given in 'Lares and Penates; or Cilicia and its Governors' (1853), pp. 262 *et seq.*

I must admit that I had always an inclination to adopt the identification of Bayas with Issus and its river with the Pinarus, an identification advocated before my time by Pococke, and since by Mr. W. B. Barker, and now by Sir Charles W. Wilson. In the first place it is the central and most commanding position on the gulf of same name. Its ancient castle on the sea-shore, and its revival in modern times under Sakali Muhammad Pasha, and its tenure by the notorious Turcoman freebooter Kutchuk Ali Oglu, with its bazaar, khan, and baths, the *beau idéal* of concentration in Osmanli architecture; its high and dry soil clothed with a luxuriant vegetation, its serai and detached villages, buried in groves of oranges, pomegranates, myrtle, and oleander, and its correspondence to Strabo's neat definition, "a small town with an anchoring station," all predisposed me in its favour. Alexander exhibited a prescience in founding Alexandria on Issus, at the modern Iskandrun, similar to what he exhibited in the foundation of Alexandria in Egypt, in as far as regarded the future, when ships took the place of galleys; but still Bayas remains to the present day the central point in the gulf of Issus.

These predilections had, however, to be given up in the presence of stern facts,—distances, existing ruins, and historical evidences.

But whilst, then, it remains certain that Issus was north of the Deli Chai, it is not quite so certain that the battle was fought on the Deli Chai. Darius is, as we have before seen, described as advancing in one day's march from Issus to the Pinarus. Now the actual site of Issus not being positively determined, if he had advanced from Urzin to the Deli Chai he would have made some 14 or 15 miles—a fair day's journey; but if Issus was a little north of the Deli Chai, he may have arrived at the river of Bayas; or, again, he may have advanced to Bayas at the same time that Alexander advanced from the Marble Gates.

It is remarkable that Polybius (xii. 17), who criticises Callisthenes' description of the battle, states on his authority, that Darius descending into Cilicia through the Pylæ Amanides, encamped on the Pinarus, at a place where the distance between the mountains and the sea was not more than 14 stadia; and that the river ran across this place into the sea, and that in its course through the level part, it had abrupt and difficult eminences. Unless this applied to the nullahs previously alluded to (and the word used, *λόφος*, will not admit of such a reading) the description corresponds to the Bayas-su, where the serai and villages, and the ruins of an

ancient Christian basilica, stand on or between ridges and eminences eastward of Bayas. But the description would also apply to the Deli Chai, supposing Darius to have encamped high up that river so as to obtain a greater command of the plain.

It is to be remarked here, in respect to the Baghtchi or "little garden," that Mr. W. B. Barker had previously crossed the same; and some French travellers (I regret I cannot lay my hand on the 'Bulletin de la Société de Géographie' to give their names) describe the pass beyond Asmaniyah or Osmaniya, as dividing into two, one of which is defended by a castle which they designate as Tchordan Kalessi.

Sir Charles W. Wilson, I may further be allowed to observe, is in error when describing the remarkable defile which divides the Taurus from the Giaour (Gawūr) Tagh (here the Dürdün Tagh), and through which the Pyramus flows, as only passable on foot; as also in supposing that Captain Bennet is the only European who has visited it. During the explorations carried on in Taurus, at the time of the Euphrates expedition, General Chesney, Lieutenant Murphy, B.E., Mr. (afterwards Sir William) Thomson, and the writer, traversed the pass on horseback. True that one of the baggage horses toppled over, but it was rescued. This was as far back as the year 1835.

Your obedient servant,

W. F. AINSWORTH, F.R.G.S.

To the Assistant-Secretary R.G.S.

. We append here the following note on the above subject, with which Mr. E. H. Bunbury, the great authority on all questions of classical geography, has favoured us [Ed.]:—

"It appears to me that Mr. Ainsworth has fairly established his case in favour of the identification of the Pinarus with the Deli Chai in preference to the Piyas or Bias—as suggested by Sir Charles Wilson—thus returning to the received view of all recent writers on the subject. But I think them both decidedly in the wrong in referring the passage of Arrian (ii. 7) to the advance of Darius with his vast army "from the broader to the narrower part of the plain." That passage, taken in connection with the account in the preceding section (ii. 6) of the advance movements of Darius, will be clearly seen to refer to the decision of that monarch to abandon the position he had previously occupied in the *great open plain of Syria*, east of the Amanus, and by crossing that range, involve himself in the narrow defiles and confined spaces between it and the Gulf of Issus. Such a resolution was little short of insanity, and it was no wonder that Alexander at first refused to believe it. But as soon as he was convinced of it he instantly saw the incalculable advantage it had given him: he pointed it out to his troops as a proof of the special interposition of the gods in their favour. How little adapted the country on the east side of the Gulf of Issus was for the operations of such an army as that of Darius, is sufficiently seen from Sir Charles Wilson's own map, inserted in the June number of our 'Proceedings.'

"E. H. BUNBURY."

Englishmen in Timor Laut.

“DUNLAPPIE,” ELSTERNWICK, VICTORIA.

May 19th, 1884.

MY DEAR SIR HENRY,—The paper read on January 28th at the Royal Geographical Society by Mr. Forbes on the Tenimber Islands, on which occasion you presided, is full of interest to me from a circumstance I will relate, and which will not bear out the idea which you appeared to entertain then, that “that part had never before been touched by the foot of an Englishman.”

Strange to say that the Londoner who was in captivity on those islands from 1822 until 1839 was also named Forbes, Joseph Forbes. He formed one of the crew of a small brig from London, which visited our young settlements at Melville Island, and thence went on a trading voyage to the Arafura Sea. At Timor Laut the master of the brig imprudently anchored, and landed with most of his small crew to “trade,” leaving on board two boys, viz. Joseph Forbes (then seventeen years of age) and one named Edwards, a Portuguese cook, and one seaman in his bunk, sick. The master, with his crew, had no sooner landed than Forbes, with a telescope, saw them all murdered by the natives, and stretched on the beach. Forbes immediately called to the other boy to help him disengage the cable, and try to make sail away; but before any sail could be set, the natives put off in canoes and boarded them, knocked the cook on the head and threw him overboard, and did the same to the sick man, who showed himself. The boys aloft dodged their arrows for some time, till Joe suggested to his mate that they could but die once, and it was better to give themselves up, or they might irritate the savages into torturing them. Having noticed their expertness aloft, the captors of the boys possibly thought they could make use of them, so they were taken on shore, and for seventeen years Joe was detained in cruel bondage. He never knew what became of Edwards. In 1839, however, when, with Sir Gordon Bremer, I was engaged in clearing for a settlement at Port Essington, Captain Watson, of the trading vessel *Essington*, who was engaged to supply the settlement with live stock, reported that he had heard of a white man being on Timor Laut, upon which Sir Gordon sent the *Britomart* with his son-in-law, Kuper (now Admiral Sir A. L. Kuper), and Owen Stanley to ascertain the truth, but they returned without success. Watson then determined to accomplish the release of Forbes, which he did most cleverly, and when brought on board he was unable to understand or make himself understood in English until nearly reaching Sydney. The poor fellow had no more intelligible way of manifesting his gratitude to Captain Watson than by presenting him with the long lock of hair which he had worn in native fashion so many years, and that lock I have now in my possession, Watson having given it me at Sydney about six years since, and not long before his death, upwards of eighty years of age. Forbes died at Williamstown (our seaport) only a few years since, and it was from his lips that I learnt most of the circumstances I now relate to you.

It is a singular circumstance that the explorer of those islands in 1878 should bear the same name as the captive of 1822.

Yours faithfully,

CRAWFORD PASCO (Capt. R.N.).

General Sir J. H. LEFROY, K.C.M.G., &c.

REPORT OF THE EVENING MEETINGS, SESSION 1883-4.

Fourteenth Meeting, 23rd June, 1884.—The Right Hon. Lord ABERDARE, President, in the Chair.

ELECTIONS.—*Harry de Freyne-french, Esq.; Edward Marcus Marcoso, Esq.; Edward Pierrepont, Esq.; George V. Sims, Esq.; John Playster Steeds, Esq.; William Wakeford, Esq.; William Murray, Esq.*

Before proceeding to the immediate subjects for the evening, the PRESIDENT said that the members of the Society would be interested to hear the latest communication from Mr. Thomson, who had returned safely to Zanzibar, after having made an adventurous journey. He had passed the two highest mountains in Africa, Kilimanjaro and Kenia, and found his way to Victoria Nyanza. Although unfortunately no less than seven of Mr. Thomson's companions had died of disease, it was gratifying to learn that not one had been killed in encounters with the natives. Mr. Thomson would hardly return to England in time to give an account of his travels to the Society during this session, but it was to be hoped that he would do so at the first meeting next session. In the meantime, it would be interesting to hear a telegram read that had been received from Sir John Kirk.

The Secretary, Mr. FRESHFIELD, then read the telegram, which has been published in the previous number of the 'Proceedings,' July, p. 399.

The papers of the evening were:—

1. "Seven Years' Travels in the region of Lake Nyassa." By the Rev. W. P. Johnson.

2. "A Journey into the Interior of Ashanti." By Captain Brandon Kirby.

The second paper is published in the present number of the 'Proceedings,' p. 447. The Rev. Mr. Johnson's paper will appear in a subsequent number.

At the conclusion of the meeting the President declared the Session of the Society terminated.

 PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Paris.—June 20th, 1884: M. BOUQUET DE LA GRYE, of the Institute, in the Chair.—The Geographical Service of the Army presented the third part of the map of Africa, scale 1:2,000,000, prepared by Captain de Launoy. An explanatory note was forwarded with the map.—A communication was received from the National Geographical Institute of Brussels, announcing its project for the publication of an atlas containing the plans of a hundred cities of the South Netherlands in the 16th century. These plans were, it was stated, for the most part the oldest extant, and gave a very accurate and reliable representation (although on a reduced scale) of the towns and their features in detail.—It was announced that news had been received from M. Cotteau, who had written on May 5th from Sarawak (Borneo). The traveller was charmed with the reception he had met with at the hands of the English, and especially of the British Resident (Sir J. Brooke being in Europe). In a sloop placed at his disposal by the Resident, he had been able to ascend the Sarawak river for a distance of 62 miles (100 kilometres). According to M. Cotteau, the country is magnificent, forest everywhere. All travelling is made on foot or by water, and is perfectly safe. The climate is

salubrious, the temperature during the day seldom exceeding 86° Fahr. (30° Cent.), while in cool nights the thermometer stands at 77° (25° Cent.), and even 73° Fahr. (23° Cent.). The impression which the traveller had formed of this "strange" country was extremely favourable. To use his own words, "It is a curious phenomenon," says he, "to see in this 19th century a population of 300,000 Dayaks, Malays, and Chinese governed by 30 Europeans economically, almost without written laws, without an army, and without police." He bears testimony to the fact that the new territories, at least the coasts, are very easy of access. According to him, Elopura on the east and Gaya on the west coast have the best prospects for the future. Kudet, the capital, on the northern extremity, is served by a fairly regular line of steamers coming from Singapore, and touching at ten other stations.

—M. H. Duveyrier read an obituary notice of Arnaud Bey, late Colonel of the Engineers in Egypt, who died on the 8th of the present month in Paris, or rather in the suburbs of Paris. The deceased gentleman was one of the most regular attendants at the meetings of the Society. His place would be marked in the history of the discovery of the basin of the Nile, as well as in that of public works in Egypt. M. Duveyrier mentioned that Arnaud Bey had at different times signified his intention of bequeathing to the Society the manuscripts of the diaries kept by him during his travels which the Society had had for a long time in its keeping, as well as other sketches and notes made in the course of his explorations in Nigritia and in connection with his works in Egypt.—M. Venukoff sent a communication from which it appeared that projects of great importance to geography were being discussed at St. Petersburg. The principal subject under consideration was the publication of a large Physical Geography of Russia in Europe, which would contain the results of the most recent investigations and studies bearing upon the configuration and composition of the ground, the rivers and sea-coasts, the climate, and distribution of the population, &c. Several eminent members of the Geographical Society of St. Petersburg were assembled to work out the scheme. The next question to be dealt with was the publication of a good general map of Russia in Europe for the use of the public, which would replace that brought out by the Society in 1863. Only points of importance determined by topography and statistics would be shown, and these according to the lists prepared by experts and approved of by a committee of editors. As regards the technical part of the work, all the inventions and resources of modern cartography would be brought into requisition. M. Lessar had just accomplished another journey in the southern part of Turkomania, in the course of which he had visited the middle portion of the country watered by the Murghab, which had never before been traversed by Europeans. M. Venukoff then added *visu voce* some information regarding the country of the Saryks, which had been explored by the Russian traveller. The scheme, about which he had already spoken at a previous meeting, concerning the concentration of the geodesical and topographical works made under the auspices of the different Russian administrations, had, he stated, been fully discussed and elaborated at St. Petersburg; it would shortly be submitted for the approval of the Imperial Government. M. Venukoff concluded his remarks by calling the attention of the Society to different papers published in the 39th volume of the "Reports of the Topographical Section of the Russian Staff," which had just appeared, and contained some details of great interest to geographers. He mentioned particularly the work by M. Lebedeff on the triangulation of Bessarabia, which was now of all Russian provinces the richest in trigonometrical and hypsometrical points; also that by M. Gladycheff on the topographical survey of the whole of Southern Turkomania and Northern Khorassan, by means of which it had been possible to prepare a good general map of the

country on the scale of 1 : 210,000. In the same volume would be found a detailed description of the country to the south-west of Bokhara, written by Captain Arkhipoff, who had visited it in 1883 ; and also a report of the topographical works executed along the frontier of the Chinese province of Ninguta, which had put an end to the uncertainty existing in the minds of the local population as to the precise direction of this frontier. Speaking at a previous meeting of the distance between Herat and the Russian frontier, M. Venukoff stated that the distance was 25 miles (40 kilometres), and *not* 6½ miles as reported in the June number of the 'Proceedings' (p. 351).—M. de Foucauld, who had recently returned from a journey to Morocco, forwarded a letter in which he gave a *résumé* at considerable length of his itinerary. It was his intention to present to the Society a more exact account when he had arranged the notes made during this journey, which lasted from June 1883 to May 1884. As long as he kept to the north of the Great Atlas he was guided by the map of M. Beaudouin, which he said represented this particular district with remarkable accuracy, but beyond this region it did not give any idea of the country. It was true that the work of Captain de Castries enabled the traveller to direct himself with the greatest precision throughout all that part of the basin of the Dra which he traversed. A fact which seemed to strike M. de Foucauld very forcibly was the small amount of authority possessed by the government of Morocco. The number of those who obeyed it was extremely limited, while the number of small tribes who were not only rebellious but independent was great. Mulai-el-Hassan was the Sultan neither in word nor deed ; he was only so in the eyes of Europeans. The limits of his empire were easily determined. It was bounded by the coast of the Atlantic Ocean and by the lower valleys of five large rivers, i. e. by the territory occupied by the tribes of the Arab race. The mountainous district, however, which formed all the central part was wholly independent. The vast regions peopled by Imaziren (Berbers) governed themselves, and recognised no power except that of their respective chiefs. There were large provinces infeoffed for centuries to families where the supreme power was hereditary, districts in which each little village formed a miniature republic, perfectly independent, with its own laws, customs, politics, and which made of its own accord wars and treaties. Industrious, intelligent, by no means fanatical although Mahommedans, these Berbers would have a much more prosperous country even than at present were it not for their continual wars.—The French Consul at Hamburg announced the departure of the German scientific and commercial expedition to Angra Pequena, and mentioned another expedition which was preparing to start from Hamburg at the end of the month for Loango. This mission was purely scientific, and its object was to traverse the African continent from Loango to Zanzibar.—The Vice-President of the Manitoba Historical and Scientific Society, Mr. Chas. N. Bell, wrote from Winnipeg on the 30th of May to the effect that he had returned from a journey of 1500 miles across the immense country of North-west America, the greater part of which he had traversed during the journey. He had made a special study of the geological formation of the country between Lake Superior and the Rocky Mountains. North-west America, he said, presented a large number of interesting points which had never been described, owing no less to the vastness of the country than to the small number of explorations made in this direction ; men of science in the Old World would find there ample scope for interesting researches. The author of the letter remarked that not a single society in England kept up a regular correspondence with the country of North-west America.

— July 4th, 1884 : M. BOUQUET DE LA GRYE, of the Institute, in the Chair.—
The Geographical Society of Toulouse wrote stating that in consequence of the
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quarantine which had just been established by Spain, one of the most important of the excursions which was to have been made in connection with the Congress of the French Geographical Societies to be held as announced already next month at Toulouse, viz. the Barcelona Excursion, would have to be abandoned. There would, however, be a certain number of other trips, especially before the holding of the Congress (from 31st July to 2nd August), in the Pyrenees to Carcassonne, and to the Montagne Noire, then after the Congress (10th August), several further excursions, among which a very important one in the Pyrenees to last for three days and a half.—The National Geographical Institute of Brussels presented a copy of the map of Equatorial Africa prepared by Dr. Chavanne upon the scale of 1 : 2,000,000, which had just been published by that establishment. This map is the most complete and accurate representation which we have of this region.—A report dated May 7th, was received from M. Chas. Ledoux, French Consul at Zanzibar, upon French and other explorers now in East Africa. The report made reference to the journey of Mr. Johnston, who was last year travelling on the Congo and who had arrived recently at Zanzibar. He was charged by the Royal Society of London to proceed to Kili-manjaro. His studies were to complete the observations made by Mr. Thomson and Dr. Fischer on this mountain of Kilimanjaro, which only a few years ago was almost unknown. M. Ledoux was astonished that for five months no news had been received of the English traveller Mr. Thomson, who was exploring the regions of the lakes Baringo and Victoria Nyanza. The Consul, however, thought that this silence ought not to give rise to apprehension, inasmuch that the route taken by this geologist was outside that followed by the caravans. The report then referred to the journey made into the country of the Masai by Mr. East, an English missionary, who had returned safe and sound in spite of the reputation for fierceness possessed by this tribe. M. Ledoux stated that Captain Foot, the recently appointed English Consul on Lake Nyassa, had been compelled to halt at Blantyre in consequence of the hostile attitude of the inhabitants. He was waiting there for the reinforcements which his colleague at Zanzibar had just despatched to him. This unfavourable attitude had been provoked by an incident which had taken place—a quarrel between the natives and an Englishman in which the latter had been killed. The inhabitants had obstinately closed their country against all white men, and had threatened death to whoever should attempt to penetrate into their land. Captain Bloyet, the head of the French station of Condoa, had sent a letter dated April 2nd, to the consul. The drought was still continuing to rage in Usagara, causing the sacrifice of numbers of human victims (to the shame of civilisation), whom the magicians picked out as the cause of the scourge. Hostilities had just commenced between the Sultans of Urori and Uhehe, the first-named having killed from 500 to 600 men of his enemy and taken in addition a large number of slaves and cattle. At Zanzibar, M. G. Revoil, before embarking for France, was engaged in classifying and arranging his collections. (It was announced that M. Revoil had just arrived in France and a letter from him dated July 2nd, from Marseilles, was read to the meeting.) It was impossible for him to overlook the misdeeds of which he had been the victim when attempting to penetrate into the interior. The authority of the Sultan not extending beyond the coast, two men who had deserted his caravan, had upon their arrival at Zanzibar been committed to prison by Saïd-Burgash at the request of the consul. It had also been ordered that the advances made to them by M. Revoil should be paid back, but the traveller had not been willing to accept this restitution.—In connection with the paragraph in this report concerning Mr. Johnston, the traveller who was last year on the Congo, M. Dutreuil du Rhins, agent at Paris of the French Mission in West Africa (Brazza Mission) requested to know if this explorer was not the Mr. H. H. Johnston who

wrote an article published some time ago in the 'Proceedings.'* M. du Rhins declared that this article was characterised by a large amount of "fantaisie," especially as regards Makoko. The mention of the river Congo at different times in the course of the discussion furnished an opportunity for one of the members to announce that a "Jeu de Congo" could now be purchased in Germany. The game was composed of a large map with sixteen pawns carrying the colours of four of the nations of Europe, France, England, Germany, and Portugal.—The Chairman then intimated the presence in the hall of M. Aumoitte, Chancellor of the French Consulate at Hanoi, who presented a work written by himself entitled 'Tonking, de Hanoi à la frontière du Kuang-si (Provinces de Bac-Ninh et de Lang-son),' Paris, 44 pp. 8vo. This work, which had previously appeared in 'Excursions et reconnaissances en Cochinchine' (Saigon, 8vo.) but had been revised and enlarged by the author, was accompanied by a map on the scale of 1:310,000, representing the route from Hanoi to That-khe through the province of Lang-son, having been prepared in July and August 1881.—M. Michel Venukoff gave tidings of several Russian explorers. On the 23rd of March last Colonel Prejevalsky was in Kuku-nor ready to start for Tibet. At the present moment he was engaged in realising his project of the exploration of the valley of the upper Yang-tsze-kiang as far as Bathang. M. Regel was stated to be at Merv pursuing botanical and other studies in the southern part of Turkistan. He hoped to penetrate into the valleys of the Paropamisus and thence to the sources of the Amu-Daria. The publication of the reports of M. Poliakoff on China (where he was at that moment) had commenced. The reading of these reports would not fail to be instructive, and especially so to commercial men. At the astronomical conference to be held at Washington on 1st of October next, Russia would be represented by three delegates to be appointed by M. Rycke the learned Russian geodesian, who had just published a work upon the selection of the First Meridian and the establishment of the Universal Hour, in which he analysed in detail all the secondary questions dependent on the main issue.—M. Rogozinski, in a letter dated May 1st, sent news of his expedition in Africa. The station which he had founded on the island of Mondoleh (west coast of Africa) directly south of the Cameroon Mountains and very near the coast, was composed of four habitations. The results attained by the expedition up to that date consisted of a series of itineraries to the west of the Mungo river and as far as the cataracts of this river. M. Rogozinski had collected from the natives all the facts he could as to the Liba or Riba Lakes, which were the object of his expedition. This information was so strange that he hesitated to make it known. The natives had told him of the existence there of men with white or probably very light skin, whose height did not exceed three feet. These were probably the native doctors and magicians, who come in that capacity to Bayong on periodical visits. The traveller had also been informed of the "Mandiba Mandene," or "great waters," which were connected with the ocean by means of a river. Another explorer, M. Passavant, from Zurich, had arrived there, also with the intention of visiting the Liba Lakes. "There is room for everybody," says M. Rogozinski, "in an enterprise of this kind, where it is a question of facts and not individuals." The latter was then only waiting for the rainy season in order to proceed again into the interior. Accompanying this communication was a manuscript map on the scale (approximately) of 1:380,000, representing the district in which this expedition was engaged.—M. Letaille then gave an account of the archaeological mission with which he had been charged (this is the second one) in

* R. G. S. Proceedings, Oct. 1883.

Tunis. During six months he had thoroughly explored the region of the Hamada, the least known part of Tunis. The excavations he had made at Macler had enabled him to find several inscriptions, one of these giving the ancient names of the town. He had been able to dig out the forum, circus, a temple, and to discover an ancient Christian chapel.—M. Ferdinand de Lesseps made a statement as to the condition of the works in connection with the piercing of the Panama isthmus. The operations were, he said, making good progress under the skilful direction of M. Dingler. There was no doubt but that the canal would be finished in 1888, as he, M. de Lesseps, had always affirmed.—Some comments were then offered by M. Guillaume Depping upon several statements made in a recent communication by M. d'Abbadie (of the Institute), who had remarked that the works of cartographers unfortunately were not protected by the law like those of literary men and composers of music, and consequently they could be copied by the first comer without even the name of the author appearing. He (M. Depping) asked why geographical societies in general, and that of Paris in particular, did not endeavour to obtain the protection and recognition by the law of the rights of travellers and explorers, the authors of original maps. There was in their case a literary or scientific property which deserved protection as much as the others referred to. MM. Bouquet de la Grye and Maunoir then spoke, and suggested that the counterfeits or imitations were very difficult to be detected, and the question of estimated value was very delicate in this case.—A communication was received from M. Jules Leclercq, Vice-President of the Royal Geographical Society of Belgium, who had recently accomplished a journey in Mexico, in the course of which he had made a special exploration of the district of Michoacan, a region about which very little had been written since the time of Alex. von Humboldt. This interesting letter furnished some curious information on the locality of Ario, the chief place of a district bearing the same name ($19^{\circ} 15' N. \text{ lat.}, 2^{\circ} 36' W. \text{ long. meridian of Mexico}$), where only recently an attempt at French colonisation had been made. The results of this experiment would have been far more hopeful if political events had not interfered, but when the war of intervention broke out in 1864 the colonists were compelled to disperse, and their houses were divided among the inhabitants of the place and some native families. The little colony had managed to acclimatise in the country the olive, vine, and other European fruit-trees. An excellent wine was made and sent to Mexico. Storms, said the writer, were frequent in this territory; indeed the name Ario signified in the native language "tempest." This dialect was still spoken in Michoacan.—The French Consul at Asuncion (Paraguay), in a letter written about the end of April last, informed the Society of the departure from that city of three German travellers, MM. C. and W. von der Steinen and Claus, who were proceeding to the province of Matto-grosso, where they were intending to explore the river Xingu, one of the principal affluents of the Amazona.—In conclusion M. Castonnet-Desfosses read a paper upon Russian colonisation in Siberia. From 1852–82 100,000 colonists had arrived and settled in the country, and when, he said, Siberia possessed railways, the transformation would be even more rapid. Her forests would then be opened up for cultivation, and her mines would become a source of wealth and prosperity.

— July 18th, 1884: M. BOUQUET DE LA GRYE, of the Institute, in the Chair.—M. Georges Revoil, who had recently returned from his journey in Africa, to which reference has frequently been made, was present at the meeting. The Chairman, having welcomed the traveller, called upon the General Secretary to read the correspondence. It appeared from a letter received from the Minister of Public Instruction that the Society had been authorised by the Government to accept the legacy bequeathed to it by one of its members, M. Leon Poirier. This bequest,

which dated some years back, the will having been made in November 1876, had been instituted for the benefit of French explorers who should distinguish themselves by some discovery. The Secretary did not state the amount of the legacy.—A communication was read from the Geographical Society of Lyons, announcing that it had instituted a competition for 1885, the object of which would be the publication of biographies of travellers natives of the district of Lyons; the prizes would consist of gold, silver, and bronze medals. Several French provincial Societies, notably that of Nancy, had already entered into the project.—Among the various works which had been presented and laid upon the table, the Librarian mentioned the Bibliography of New Guinea by Mr. E. C. Rye, Librarian of the Royal Geographical Society of London. "This excellent work," he said, "contains not less than 850 bibliographical indications." Another work presented at this meeting was a book upon Corea, which had appeared in the 'Revue Maritime et Coloniale,' the author being M. Baudena, an officer in the navy. The latter stated that he was on the point of starting for Tongking, where he was going to command a gunboat. The small draught of this vessel would enable him to ascend to the upper parts of the Tongking river and to make a survey of its course, rectifying any inaccuracies which might exist on present maps. In connection with Corea it should be stated that a native work on this country has been made known by the ambassador of the United States in Corea. This was said to be the first work that had appeared in Corea. The author was Tchōi-tche-won, born about 600 A.D.—A Report was then read by M. Venukoff from M. A. Regel upon his journey to Shugnan and Badakshan. The author was charged in 1882 by the Governor-General of Turkistan with a scientific mission to the eastern part of the Khanat of Bokhara, viz. the two countries just mentioned. The expedition lasted five months, and the traveller was accompanied by a topographer, M. P. E. Kossiakoff, and three Cossacks. The preparations for the journey were made at Tashkend and Samarkand, and M. Regel started in the month of June. Upon his arrival at Tar-Pianj he was well received by the Shah Yousouf-Ali-Khan-Agha, one of the most important personages in this part of Asia, who had been reported as astute and cunning, but appeared on the contrary very pleasant and open to the Russian traveller. It was some days after his arrival at this place that M. Regel made an excursion to Shiwa-kul, which had been represented up to the present time as forming part of the Pamir; and there, he says, "I had the good fortune to be the first European to see the extensive Lake of Shiwa, the breadth of which is 27 miles (40 versts) and its altitude 11,000 feet." The vegetation in the vicinity of the lake was alpine, its south side only containing some thickets of juniper-trees and wild-rose bushes. Having arrived at Shakbeg, the chief village of Ghoran, where he made some excursions around the mines, he received in January 1883 the visit of an Afghan officer, accompanied by twelve soldiers, who gave him the order to quit the country, following the same route as the one by which he had entered.—M. Mano wrote, on May 28th from Panama, that he had just completed a journey of nine months in the north-west of Guatemala and on the Mexican frontiers of Chiapas and Yucatan. The letter stated that he had been very fortunate in discovering monuments and important groups of ruins, some of the latter having been entirely unknown up to the present time. Many of the monuments found by him had remained intact, having escaped the depredations and Vandal fanaticism of the "conquistadores." M. Mano, who it was stated travelled in company with his wife, had since formed the intention of going by land from Maracaibo to Cayenne, crossing the Orinoco about the 6th degree of north latitude.—In his last letter to the Society, M. Rogozinski, the commander of the expedition to the Liba Lakes, referred in gratifying terms to the zeal and devotion of two of his companions, and among others M. Tomczek. In a more recent

communication, which was read at the meeting, dated June 5th from his station of Mondoleh,^a he informed the Society of the death of his friend, who had succumbed to an attack of inflammation of the liver, having been buried on May 10th. M. Tomczek was born in 1860, in the Grand Duchy of Posen, and started when very young and full of enthusiasm for Africa. He had succeeded in exploring the Rio del Rey and discovering the sources of the river. He had, moreover, prepared a dictionary of the Kruman language, and had collected numerous notes (7 volumes) on the countries visited by him, some of which had never before been traversed by the white man. His last work was the map which had been sent by M. Rogozinski to the Society, and presented at a former meeting.—A communication was read from MM. Cotteau and Korthals, who were charged with a scientific mission to Krakatoa, and wrote from Batavia on June 2nd to the effect that, having arrived on May 26th on the scene of the catastrophe, they had proved the entire disappearance of three islands which had risen the day following the eruption of the volcano. One of these islets was situated on the east of the island of Verlaten, which, but recently a mass of verdure, was now covered all over with a stratum of ashes nearly 100 feet (30 metres) in thickness. It would almost seem from a distance to have the appearance of a glacier, in consequence of the deep crevasses which furrowed its surface and were still further enlarged by the action of the rain. Another fact announced by the two travellers was the termination of the activity of Krakatoa. At Batavia it had been generally believed that the clouds seen hovering above the volcano were the result of gaseous matters emitted from the crater, and upon approaching it from the point where the great convulsion of the 26th and 27th August took place, the travellers were of the same opinion. But, having launched a canoe and approached the volcano from the foot of the cliff, they observed that the supposed fissures were simple ravines, and that what they from the distance had taken for vapours was nothing else but particles of dust raised into clouds by the incessant falling of stones bounding down steep declivities. A sailor had been struck on the leg by a stone no larger than a small orange, while at the same time a block considerably bigger than a shell of the largest dimensions had fallen by the side of the boat employed by the two scientific travellers. They had succeeded in approaching very near to the foot of the volcano, and in collecting specimens of rocks at several different points.—M. Dutreuil du Rhins then gave some information on the subject of M. de Brazza and his reception by Makoko, which would, he said, be in addition to the news already given in the daily papers. It was on February 15th that the commander of the expedition started from the Alima for the Congo. It might be said perhaps that he remained a long time (six months) in the country situated between Franceville on the Ogowé and the Alima, but this long stay had been occasioned by the extensive works executed in order to abridge the land route between Franceville and the point where navigation commenced to be practicable on the Alima. This distance, recently 75 miles (120 kilometres), was going to be reduced to from 9 to 12 miles (15 to 20 kilometres), for an affluent of the Ogowé had been discovered, which in the future would be followed in order to reach the station on the Alima. Having started, therefore, on February 15th, M. de Brazza descended this tributary of the Congo (viz. the Alima) accompanied only by a man and a boy—a position widely different from that in which he found himself two or three years ago, when with all his companions he had been obliged to retrace his steps in consequence of the threats of the Apfurus. On March 27th he arrived at Nganchuro, the port of Makoko on the Congo, and on the 30th he was at Makoko's, where he remained twenty days. On April 30th he was at Brazzaville, which had been abandoned a year before, but was now reoccupied. There existed there at the present time seventeen large dwellings. The sanitary condition was

excellent, and the relations with the natives all that could be desired. News from the Ogowé, where M. Decazes was situated, was favourable. The two sloops, made so as to be taken to pieces and intended for the navigation of the Congo, would be launched before the end of the year on the Alima. Finally, M. Dufourcq, in sending some specimens of the products of the Lower Ogowé, and among other things cotton, had given in a private letter to M. Dutreuil du Rhins some highly interesting information on the chief station of the French Mission at Cape Lopez. This station, where, six months ago, there were only three or four huts, numbered fifty at the present time. It was hoped that a year hence the station would be in a position to rival Libreville (Gabon), which was much less salubrious. The correspondent stated that not one of Stanley's stations, although perhaps better supplied with tools, was capable of a more rapid extension or such an extensive development. The last item of information given by M. du Rhins was that Dr. Ballay, the companion of M. de Brazza, had left him on May 5th and returned to France, bringing with him a complete survey of the Alima and a large collection of sketches and plans.—The Chairman then declared the Session 1883-4 at an end, and stated that the Society would adjourn until the 7th November, when it would recommence its operations for the next session 1884-5.

Geographical Society of Munich.—Session 1883-84. During the winter 1883-4 eight public and four Members' meetings of the Society were held. Herr Audebert, of Metz, opened the session on the 16th and 19th of November, 1883, with two papers on Madagascar, the contents of which were intended to complete those given by him in Berlin.—On December 2nd, Dr. Shubrat Rohmeder read a report upon the Sub-Commission appointed by the Society for the promotion of scientific knowledge of the country in Bavaria. An account in detail of the proceedings of this Commission is to be found in the Eighth Annual Report of the Society.—Dr. Penck then gave a sketch of the Eckstein process for the reproduction of maps, and illustrated this ingenious method by an exhibition of some sheets of the map of Java.—On December 13th, Dr. Penck read a paper upon Béarn and Upper Aragon. He made special reference to the difference of climate and agriculture exhibited by these provinces, which are separated by the Pyrenees, and endeavoured to show that the marked separation of the two was the result of distinct historical development rather than of any difference in their natural conditions. He maintained that the chain of the Pyrenees did not constitute such an absolute wall of separation as was generally affirmed. (See 'Deutsche Romanzeitung,' 1884.)—On December 27th, Professor Tolly, of Würzburg, read an account of the travels he had recently made in India, and gave a rough sketch of the people and the various schools of religion in the country. (See 'Deutsche Rundschau,' 1884.)—The annual election of the officers of the Society took place on January 17th, when Professors Tolly and Zittel were elected Presidents; Dr. Penck and Dr. Rohmeder Secretaries; Herr von Neis Treasurer; Professor Moritz Wagner Curator; and Captain Förster Librarian.—Herr Buchta, the African traveller, then read a paper upon the rebellion in the Soudan, which he said was caused in the first instance by the mismanagement of the Egyptians, and had grown in consequence of the neglect of the English. The suppression of the insurrection was desirable in the interests of civilisation, for the spirit of rebellion would seize the whole Mahommedan world. (See 'Ausland,' 1884.)—On January 31st, Dr. Karl Alfred Zittel made some observations upon his journey from the Atlantic to the Pacific Ocean which he undertook in connection with the opening up of the North Pacific Railway route. He described the natural features of the East and West, the lake districts of Minnesota and the cañons of Dakota. (See 'Deutsche Rundschau,' 1884.)—At the meeting held Feb. 14th, Dr. Oberst von Orff, Director of the Topographical Department, read a report on the object and

operations of the latter. After enumerating the various changes which it had experienced from the time of its foundation until it was subordinated to the Staff, he passed in review its achievements. These consisted in the publication of the Staff map, scale 1 : 50,000, the survey map of South-west Germany, scale 1 : 250,000, sheets of positions, scale 1 : 25,000, and the sheets bordering on Bavaria of the map of the German Empire, scale 1 : 100,000. The report will be found printed in the Society's Annual Report.—On February 28th Professor von Bezold, head of the Meteorological Central Station, read a paper on the twilight phenomena observed last winter, which he said consisted exclusively in an enhancement of normal sunset effects resulting from causes not yet explained.—At the meeting held on March 18th, Dr. Eugen Oberhummer spoke upon Italian knowledge of the present and ancient geography of Italy, and dwelt especially on changes in relations of geography, climate, and ethnography.—On March 27th Dr. Vogel communicated some observations on South Georgia, which he had had the opportunity of making in connection with the German Expedition sent to establish a scientific observatory in the Antarctic Regions. In consequence of the Fourth German Geographical Conference held at Munich from April 17th to 19th, the April meetings of the Society were postponed. The members of the Society took a lively and practical interest in the proceedings of the Congress.

NEW BOOKS.

(By E. C. RYE, *Librarian R.G.S.*)

EUROPE.

[*Corsica*]—Collection des Guides-Joanne. Itinéraire général de la France, par Paul Joanne. Corse. Paris (Hachette): 1884, pp. xxxvi. and 128, maps. (*Hachette*: price 5 frs.)

This separate new edition supersedes the 1877 *Corsica* of Joanne's series, which, edited as to that island by M. Chas. Raymond, was included in one volume with Provence and the Alpes Maritimes. It has now been re-written and enlarged to such an extent as to be practically a new work, the revision being by M. Lequeutre, who spent several months in Corsica for the purpose. No corner of the island has been passed over; mountain ascents are inserted, and the scenery is described with a taste and discrimination rare in works of this class. No special attention is given to botanical or zoological subjects, and, beyond the statement that the shepherds of Taïta are mighty hunters of moufflon, there seems no reference to the interesting question of the existence or distribution of that animal in the island. Mr. Freshfield ('*Alpine Journal*, x. p. 218) saw none, and believes they are as hard to come at as bears in the Trentino. Mr. F. F. Tuckett, however, *l. c.* p. 327, records their existence on the Col di Guagnerola, and considers that the peaks at the heads of the valleys of Niolo, Lonca, Filosorma, Ficarella, Tartagine, and Asco are likely to be their head-quarters.

M. Joanne has taken advantage of the recent completion of the Government Survey to add three district maps of portions of the country (environs of Ajaccio and Corte, and Gulf of Porto). He also gives a general map, showing the network of carriage-roads and railroads in construction, and which might be consulted with advantage by the makers of English atlases, which give an imperfect representation of the orography and means of communication of Corsica. Monte Cinto, 8891 feet, is the highest summit, and not Monte Rotondo, 8775 feet.

ASIA.

India: North-Western Provinces.—Statistical, Descriptive, and Historical Account of the North-Western Provinces of India. Vol. viii. Part i. Muttra. By H. C. Conybeare, F. H. Fisher, B.A. Lond., and J. P. Hewett, all of the Bengal Civil Service. Pp. (2) and 231, Index v., maps. Part ii. Allahabad. Compiled by C. D. Steel, Bengal Civil Service, and edited by F. H. Fisher and J. P. Hewett. Pp. 216, index iv., map. Part iii. Fatehpur. By J. P. Hewett. Pp. 142, index iii., map. Allahabad (North-Western Provinces and Oudh Government Press): 1884, large 8vo.

——— Vol. xiii. Part i. Azamgarh. By F. H. Fisher, B.A. Lond., Bengal Civil Service. 1883, pp. 6 and 186, index, pp. vi., map. Part ii. Gházipur. Compiled by J. E. Gill, B.A. Oxon., Bengal Civil Service; and edited by F. H. Fisher. 1884, pp. 4 and 147, index, pp. iv., map. Part iii. Ballia. Compiled by D. T. Roberts and A. Robinson, both of the Bengal Civil Service; and edited by F. H. Fisher. 1884, pp. 4 and 141, index, pp. iv., map. Allahabad (North-Western Provinces and Oudh Government Press): large 8vo.

The present volumes are on the same scheme as those in the series mentioned above, pp. 300 and 354. The district maps are on the usual scale of 8 miles to the inch, and in Vol. viii., Part i., a plan is given of Muttra or Mathurá, on the scale of half a mile to the inch. Perhaps the account of the processes of cultivation and manufacture of opium and tobacco in the Gházipur district, which contains the head-quarters of the Benares Agency, is the most noticeable portion of Vol. xiii.

Mesny, William.—Tungking. London (Sampson Low, Marston, Searle, & Rivington): 1884, post 8vo., pp. xi. and 143. Price 3s. 6d.

Chiefly an historical account of Tong-king, based on the Yüeh-nan-chi-lio, a native work published in Kwang-si, and in anticipation of a book to be called 'The Chinese Empire,' which will contain an account of Major-General Mesny's travels, experiences, and observations. The origin and present status of the "Black Flags" are discussed, and a sketch is given of the mineral and other resources of the country.

Reclus, Elisée.—Nouvelle Géographie Universelle. La Terre et les Hommes IX. L'Asie Antérieure. Paris (Hachette): 1884, 4to. pp. 951, 6 coloured maps and 166 maps in text, 84 illustrations. (*Hachette*: price 1l. 5s.)

Vol. viii., 'L'Inde et L'Indo-Chine' (pp. 983, 7 coloured maps, 204 maps in text, and 84 illustrations), was published in 1883. The present volume covers Afghanistan, Baluchistan, Persia, Turkey, in Asia, Lazistan, Armenia and Kurdistan, the Tigris, Euphrates, Mesopotamia, &c., Asia Minor, Cyprus, Syria, Palestine, Sinai, and Arabia. Both are treated with the scrupulous attention to authority, lucidity of exposition, and elaboration of important points, which have rendered the earlier issue of the series so valuable for referential purposes. Africa is commenced in the first livraison of the tenth volume, so that if the amended scheme of 15 volumes is adhered to, five of them will be devoted to that continent, North and South America, Oceania, and Australasia.

The large map illustrating vol. ix. is on the scale of 1:9,000,000.

AUSTRALASIA.

Journet, F.—L'Australie. Description du Pays, Colons et Natifs, Gouvernement, Institutions, Productions, Travaux publics, Mines. Paris (J. Rothschild): 1885 [1884], 8vo., pp. viii. and 376, map. (*Dulau*.)

The author (who holds an official position as Ingénieur des Ponts et Chaussées) was sent on a mission by the Ministry of Public Works in France to the International Exhibition at Melbourne, and now publishes a resulting study of Australia. Unlike most other works of the kind, there is no division of its

contents under the heads of the separate Colonies, but the great physical, political, and economical features of each are treated as a whole under the different subjects. Attention is specially given to those points in which the natural configuration and products have a bearing on the development of industries or an immediate value to man; and to the public works on land and water (as to which the author's professional instincts lead him to give much accurate and interesting detail). A slight sketch of the aborigines concludes the book. The map (scale 125 miles to the inch) is very clearly executed, and coloured geologically.

Kerry-Nicholls, J. H.—*The King Country; or, Explorations in New Zealand. A Narrative of 600 miles of travel through Maoriland.* London (Sampson Low, Marston, Searle, & Rivington): 1884, 8vo., pp. xx. and 379, map and illustrations. Price 21s.

The author left Auckland for Tauranga early in March 1883, and after a visit to the well-known hot spring region succeeded in traversing from south to north the "King Country" or Native reserve of the North Island of New Zealand, hitherto closed to Europeans, and of course unsurveyed. In this journey, he claims to have "discovered many new rivers and streams, penetrated almost inaccessible regions of mountainous forest, found extensive areas of open plains suitable for European settlement, traced the sources of three of the principal rivers of the Colony [the Waikato, Whanganui, and Whangaeahu], examined the unknown shores of its largest lake [Taupo], ascended one of the highest mountains of the southern hemisphere [Ruapehu, 9050 feet], and experienced degrees of temperature varying from 80° in the shade to 12° below freezing point." The map appended to the work (scale 11 miles to the inch) is also stated to be the most complete chart of the interior of the North Island as yet published; it contains a table of altitudes of nearly 100 camping places and stations along the author's routes, from which the conformation of a large portion of the island may be arrived at.

Lake Taupo is considered to be the crater basin of an extinct volcano, and its hydrography is elucidated by the addition of seven rivers besides smaller streams on its western and three on its northern shores, besides the eight feeders already recognised. It also receives in the south an enormous volume of water from the upper Waikato, and has only one outlet, the Waikato, at its north-eastern end; so that during the rainy season its rise is rapid and enormous, and its surface is lashed into furious waves by heavy winds. Its mean altitude was fixed at 1175 feet, its length at 24 miles, breadth at 14 miles, and superficial area at over 300 miles.

Mt. Ruapehu was found to contain the sources of the Waikato and Whangaeahu, at almost the same altitude (over 7000 feet); both run almost parallel for a long distance from their origin, and then gradually diverge, the former to the north and the latter to the south.

The appendix contains, amongst other things, a list of the New Zealand tribes with their localities; a synopsis of the flora observed, arranged according to native names; birds, reptiles, and insects, treated in the like way, and with but slight attempt at precision; and a brief reference to the Maori language.

The illustrations of scenery, &c., are mostly from sketches by the author; there are also many portraits of native chiefs and women, from photographs.

OCEANIA.

Lesson, A.—*Les Polynésiens: leur Origine, leurs Migrations, leur Langage, par le Dr. A. Lesson . . . Ouvrage rédigé d'après le manuscrit de l'auteur par Ludovic Martinet. Tome Quatrième.* Paris (Ernest Leroux): 1884, 8vo., pp. 430. (*Dulau*: price of the whole work, 2l. 8s.)

Of this great work, now completed, vol. i. (pp. vii. and 523, map) appeared in 1880; vol. ii. (pp. 552, map) in 1881; and vol. iii. (pp. vii. and 499, map) in 1882. The geography of the Oceanic islands is practically so inseparable from their ethnology, that a notice may here be usefully given of the contents of these volumes, the main object of which is almost diametrically opposed to the generally received opinion that Polynesia has been peopled from the west

by Asiatic or Malayan colonies. The Polynesians are in short, according to Lesson's deductions, true Maoria, whose physical characteristics and dialects have been more or less modified by their settlement in more equatorial regions than New Zealand, from which they originally emigrated, and who have spread westwards from Polynesia. Vol. i. is divided into two parts, of which the first discusses Oceanic ethnology in general, and the Melanesian and Polynesian races in detail; the first comprising the Negrito, Papuan (Papous and true Papuans), Tasmanian and Australian divisions, and the second the Malays, Javanese, Malaisians (Battaks, Dayaks, Bonguis and Alfurus), and Caroline and Marianne islanders. The second part commences the investigation of theories on the origin of the Polynesians, whose national identity is maintained, and contains (with a negative result) the discussion of the ideas of a submerged continent and of an American start-point.

Vol. ii. concludes the investigation of theories by examining and refuting the evidence as to an Asiatic immigration, and then proceeds to consider the real origin of the Polynesians according to the author's plan, the Sandwich, Marquesas, Paumotu, and Gambier islands, Easter island, Tahiti and Manais, being separately treated. Another section of this volume is devoted to research as to the original habitat of the Samoans and Tongans (from whom the Fijians are widely separated), and it is concluded that the Samoans came from Tonga, and that Tonga itself was first peopled from New Zealand.

Vol. iii. exclusively relates to New Zealand, and the conclusions are arrived at (1) that the centre of creation of the Maori race was in the south island of New Zealand, which the author identifies as Kawai, placing in it the hitherto unsettled "Hawahiki," considered to be a collective expression and not a definite island; and (2) that the north island was peopled from the south one.

Vol. iv. discusses the proofs, causes, dates, and progress of Maori migrations, including a chapter on the existence of that race in Africa, America, and Asia; and in an appendix the zoology, botany, mythology, legends, and traditions of New Zealand are investigated at some length. A valuable bibliography is also appended, and there is a good index. The maps are of general Oceania, the Indian and Pacific oceans, and New Zealand, only of value for textual reference.

GENERAL.

['Challenger.']—Report on the Scientific Results of the Voyage of H.M.S. *Challenger* during the years 1873–76, under the command of Captain George S. Nares, R.N., F.R.S., and Captain Frank Tourle Thomson, R.N. Prepared under the superintendence of the late Sir C. Wyville Thomson, Knt., F.R.S., &c. . . Director of the Civilian Scientific Staff on board, and now of John Murray, F.R.S.E., one of the naturalists of the Expedition. Physics and Chemistry, vol. i. Published by order of Her Majesty's Government. London (Longmans & Co., &c.), Edinburgh (Black, &c.), Dublin (Thom, &c.): 1884, 4to., pp. viii., 251, 46, and 2, plates, charts, and tables. Price 21s.

This volume contains:—i. Report on Researches into the Composition of Ocean-water, collected by H.M.S. *Challenger* during the years 1873–1876, by Prof. William Dittmar, F.R.S. (completing the analysis of the collection of surface and bottom water, made by Mr. J. Y. Buchanan). ii. Report on the specific gravity of samples of Ocean-water, observed during the same period, by Mr. Buchanan. iii. Report on the Deep-Sea Temperature Observations of Ocean-water, taken by the Officers of the Expedition, during the years 1873–1876, with 258 sections and 7 tables.

The other publications of this series are:—Narrative, vol. ii. (1882, pp. viii., 744, 42, and 29, plates, containing magnetical and meteorological observations, with appendices by Prof. P. G. Tait on Pressure Errors of the *Challenger* Thermometers, and by Prof. A. Renard on the Petrology of Saint Paul's Rocks, Atlantic: price 30s.), and vols. i.–viii. of the Zoology (1880–1883, copiously illustrated, price respectively 37s. 6d., 50s., 50s., 50s., 50s., 42s., 30s., and 40s.). Vol. i. of the Narrative is not yet published. The Society is indebted to the Lords of the Treasury for a complete copy so far as issued.

NEW MAPS.

(By J. COLES, *Map Curator* R.G.S.)

ARCTIC REGIONS.

- Karischen Meeres.**—Karte des——. Von Andr. Hovgaard. Scale 1:3,300,000 or 45·2 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' 1884, Seite 254. Justus Perthes, Gotha. (*Dulau.*)
- Sibirischen Eismerees.**—Temperatur u. Salzgehalt des——. Nach den Beobachtungen der Vega-Expedition graphisch dargestellt von H. Mohn. Petermann's 'Geographische Mittheilungen,' Jahrgang 1884, Tafel 10. Justus Perthes, Gotha.

EUROPE.

- Ennsthaler-Gebirge.**—Das Gesäuse mit dem——. Die Haller-Mauern, Grosser & Kl. Buchstein, Tamischbachthurm, Sparsfeld & Reichenstein, Hochthor, Hoch-Zinödl & Lugauer. Für Touristen bearbeitet von G. Freytag. Scale 1:50,000 or 1·4 inches to a geographical mile. Artaria & Co., Wien 1884. With letterpress. Price 5s. (*Dulau.*)
- France.**—Carte de——, dressée par le Service Vicinal par ordre de M. le Ministre de l'Intérieur. Scale 1:100,000 or 1·3 geographical miles to an inch. Paris. Hachette et Cie., 1884. Sheets:—IX.—24, Ile de Ré; XIII.—13, Laigle; XV.—11, Gisors; XVI.—13, Paris (Ouest); XVII.—13, Paris (Est); XXII.—17, Langres (Ouest); XXIV.—13, Pont-à-Mousson; XXIV.—14, Nancy; XXIV.—17, Jussey; XXVI.—14, Sarrebourg. Price of each sheet, 7d. (*Dulau.*)
- Harzgebirge.**—Karte vom——, von L. Deichmann. Scale 1:200,000 or 2·7 geographical miles to an inch. Kassel, Kleimenhagen Price 1s. (*Dulau.*)
- Italia.**—Carta generale con aggiunta dei Contorni di Roma, di Napoli, e dei Tre Laghi, disegnata da Carlo Cerri. Scale 1:1,728,000 or 23·3 geographical miles to an inch. Artaria & Co., Vienna 1884. Price 4s. (*Dulau.*)
- Nord-Italien.**—Chr. Michel's Spezielle Gebirgs-, Post- und Eisenbahn-Reise-Karte von Nord-Italien nebst Theilen von Krain, Kärnthen, Tyrol und der Schweiz. Scale 1:600,000 or 8·1 geographical miles to an inch. J. A. Finsterlin, München. Price 3s. 6d. (*Dulau.*)
- Pauillac.**—Carte de——, exécutée suivant décision du conseil général du 23 Août, 1875. Scale 1:40,000 or 1·8 inches to the geographical mile. Bordeaux, Féret et fils. (*Dulau.*)
- Skye, Isle of.**—Reduced Ordnance Map of——. Scale 1:127,020 or 1·74 geographical miles to an inch. By J. Bartholomew, F.R.G.S. A. & C. Black, Edinburgh. Price 2s. 6d. coloured.

ORDNANCE SURVEY MAPS.

Publications issued from 1st to 29th February, 1884.

6-inch—County Maps:—

ENGLAND: **Derbyshire** (part of): Quarter sheets. With Contours: 26 S.W.; 36 S.W. with 27 S.W. (Nottinghamshire); 38 N.W. Without Contours: 29 S.W.; 31 N.W. with 22 N.W. (Nottinghamshire); 33 N.E.; 39 S.W.; 40 S.W.; 62 S.E. with 53 S.E. (Staffordshire); 1s. each. **Norfolk** (part of): Quarter sheets, 37 S.W.; 58 N.E., 58 S.E.; 59 S.W.; 70 N.E., 70 S.E.; 73 N.E.; 78 S.W. with 2 S.W. (Suffolk); 82 S.E.; 93 N.W.; 97 S.W.; 102 S.E. with 13 S.E. (Suffolk); 104 S.W. with 15 S.W. (Suffolk);

107 S.W. with 17 S.W. (Suffolk); 1s. each. **Nottinghamshire** (part of): Quarter sheets. Without Contours: 22 N.W. with 31 N.W. (Derbyshire); 40 N.W., 40 N.E.; 44 N.E. with 2 N.E. (Leicestershire); 27 N.W. with 36 N.W. (Derbyshire). With Contours: 27 S.W. with 36 S.W. (Derbyshire); 1s. each. **Suffolk** (part of): Quarter sheets, 2 S.W. with 78 S.W. (Norfolk); 4 N.W., 4 N.E., 4 S.E.; 13 S.E. with 102 S.E. (Norfolk); 15 S.W. with 104 S.W. (Norfolk); 17 S.W. with 107 S.W. (Norfolk), 17 S.E.; 23 S.W.; 32 N.W.; 43 N.W., 43 S.E.; 1s. each.

IRELAND: Meath (revised). Sheet 10.

25-inch—Parish Maps:—

ENGLAND: **Bedford:** Dunton, Area Book; Oakley, Ar. Bk.; Stevington, Ar. Bk. **Cornwall:** St. Teath, 16 sheets and Ar. Bk. **Gloucester:** Owlpen and Do. (Det., Nos. 1 to 6), 6 and Ar. Bk.; Taynton, 9; Tibberton, Ar. Bk.; Uley, 6 and Ar. Bk. **Leicester:** Normanton le Heath, Ar. Bk.; Ravenstone, Ar. Bk.; Staunton Harold, Ar. Bk.; Worthington, Ar. Bk.; **Monmouth:** Christchurch, 15 and Ar. Bk.; Goldcliff, Ar. Bk.; Nash, 9 and Ar. Bk.; St. Woollos, 11 and Ar. Bk. **Norfolk:** Besthorpe, 4; Fundenball, 3; Hockering, Ar. Bk.; Horsford, 11; Horsham St. Faith with Newton St. Faith, 7; Lyng, Ar. Bk.; Mattishall, Ar. Bk.; Rushford, 10; Spixworth, 4; Tasburgh, 3; Taverham, 8; Thompson, 9 and Ar. Bk.; Watton, 7; Woodrising, 6; Wymondham, 18. **Nottingham:** Bilborough, Ar. Bk.; Bulwell, Ar. Bk.; Nuthall, Ar. Bk.; Wollaton. **Shropshire:** Acton Round, 10 and Ar. Bk.; Aston Eyre, 5 and Ar. Bk.; Brompton and Rhiston, 6 and Ar. Bk.; Chelmarsh, 9 and Ar. Bk.; Claverley, Ar. Bk.; Easthope, 5; Eardington, 5 and Ar. Bk.; Glazeley, 6 and Ar. Bk.; Monkhopton, 9; More, 6; Morville, 11 and Ar. Bk.; Much Wenlock, 3s.; Pattingham, 1s.; Quatford, 4 and Ar. Bk.; Quatt, 8 and Ar. Bk.; St. Leonard, 3 and Ar. Bk.; St. Mary Magdalene, 3 and Ar. Bk.; Worfield, 20. **Suffolk:** Aldringham with Thorpe, Ar. Bk.; Alnesbourn Priory, 5; Barningham, Ar. Bk.; Bramford, Ar. Bk.; Friston, 8; Hacheston, Ar. Bk.; Purdis Farm, Ar. Bk.; Rushmere, Ar. Bk.; Sternfield, 3 and Ar. Bk.; Tunstall, 10 and Ar. Bk.; Westerfield, 3; Whitton cum Thurlston, 4.

Town Plans—5 ft. scale:—

IRELAND: Belfast (revised), Sheets 20, 32, 45, 46, 50, 57, 58.

ASIA.

Tonkin.—Carte du—, corrigée et augmentée Mai 1884, par A. Gouin. Scale 1:755,000, or 10·3 geographical miles to an inch. Paris. Price 4s. (*Dulau.*)

AFRICA.

Afrique Equatoriale.—Carte de l'—, entre le Congo et l'Ogooué dressée d'après l'état des dernières explorations à l'échelle de 1:2,000,000 or 27 geographical miles to an inch. Par le Dr. Joseph Chavanne, actuellement au Congo. Une feuille format impérial, tirée en 7 couleurs et pliée en carton, avec notice. Bruxelles, Institut National de Géographie, 1884. Price 3s. (*Dulau.*)

This map shows all the stations of the African International Association, together with those of the various Missionary Societies and the European Factories. Routes of twelve of the principal travellers are also laid down, and, in the Notice which accompanies this map, the author has given a list of the authorities from whom he has obtained the information for its compilation.

Afrique Orientale.—Croquis d'une carte de—, par E. F. Berlioux. Scale 1:10,000,000 or 136·9 geographical miles to an inch. Lyon. (*Dulau.*)

Angra Pequena und Süd-Afrika.—Karte von—, Scale 1:8,000,000 or 109·5 geographical miles to an inch. H. Müller und C. Riemer. Weimar, Geographisches Institut. With Inset Maps. Price 1s. (*Dulau.*)

Though drawn on a small scale, this is a very good map of South Africa. It is evidently intended to illustrate the existing interest that Germany has in

this portion of the world, as well as the part that Germans have taken in the exploration and development of the country. There are two inset maps, one showing West Germany, the Netherlands, and Belgium, on the same scale as the map of South Africa, and the other is one of Namaqua Land on an enlarged scale. There is also a small plan of Angra Pequena given, as well as scales of geographical miles, statute miles, and kilometres.

Angra Pequena.—Plan von — mit der Besetzung des Hauses F. A. E. Lüderitz in Bremen. Nach den Aufnahmen S. M. Kbt. "Nautilus." Scale 1 : 175,000 or 2·4 geographical miles to an inch. 'Petermann's Geographische Mitteilungen,' 1884, Seite 274. Justus Perthes, Gotha. (*Dulau.*)

Nile Provinces.—Map of the — from the Railway Terminus at Siût to Berber. Scale 1 : 1,013,760 or 13·9 geographical miles to an inch. Compiled and lithographed at the Intelligence Branch, War Office, under the direction of Major W. R. Fox, R.A., D.A.Q.M.G. April 1884.

This map is a continuation on an enlarged scale of the map of the Egyptian Sudan published by the same Department; it contains a large amount of detail, and is very well executed.

Sahara.—Chemin de Fer Trans-Saharien, tracé par l'Oned Mya. Scale 1 : 800,000 or 10·9 geographical miles to an inch. Imp. Dufrenoy. Gravé par Erhard. Paris. With sections. (*Dulau.*)

Suakin and Berber.—Sketch Map of country between —, with notes on the principal routes. Scale 1 : 506,880 or 6·9 geographical miles to an inch. Lithographed at the Intelligence Branch, War Office, under the direction Major W. R. Fox, R.A., D.A.Q.M.G. June 1884.

This map is on a larger scale than that of the same district previously published by this Department; it contains a great amount of detail and many valuable notes as to water, forage, routes, &c.

Wassaw and Aowin.—Map of Routes in —. By Ass^t Inspector C. W. Thompson, Gold Coast Constabulary, F.R.G.S. March 1884. Scale 1 : 380,160 or 5·2 geographical miles to an inch. Lithographed at the Intelligence Branch, War Office, London, May 1884.

The author of this map gives the following account of the manner in which he conducted his survey and fixed his positions:—"In my survey I used an excellent 8-inch sextant by Cary, and made careful astronomical observations for latitude at all the principal villages, so I feel confident that that portion of the map north of 5° N. lat., and west of 1° 20' W. long. is, as regards latitude, correct within 30'' or 40''.

"Having no chronometers, I determined the longitudes by account, with the exception of that of the Commissioner's house near Tarquah, which I obtained by observation of lunar distance.

"The altitudes were determined by observation of aneroid, compared with a table of hourly barometrical pressure which I had previously prepared at sea-level at Accra."

ATLASES.

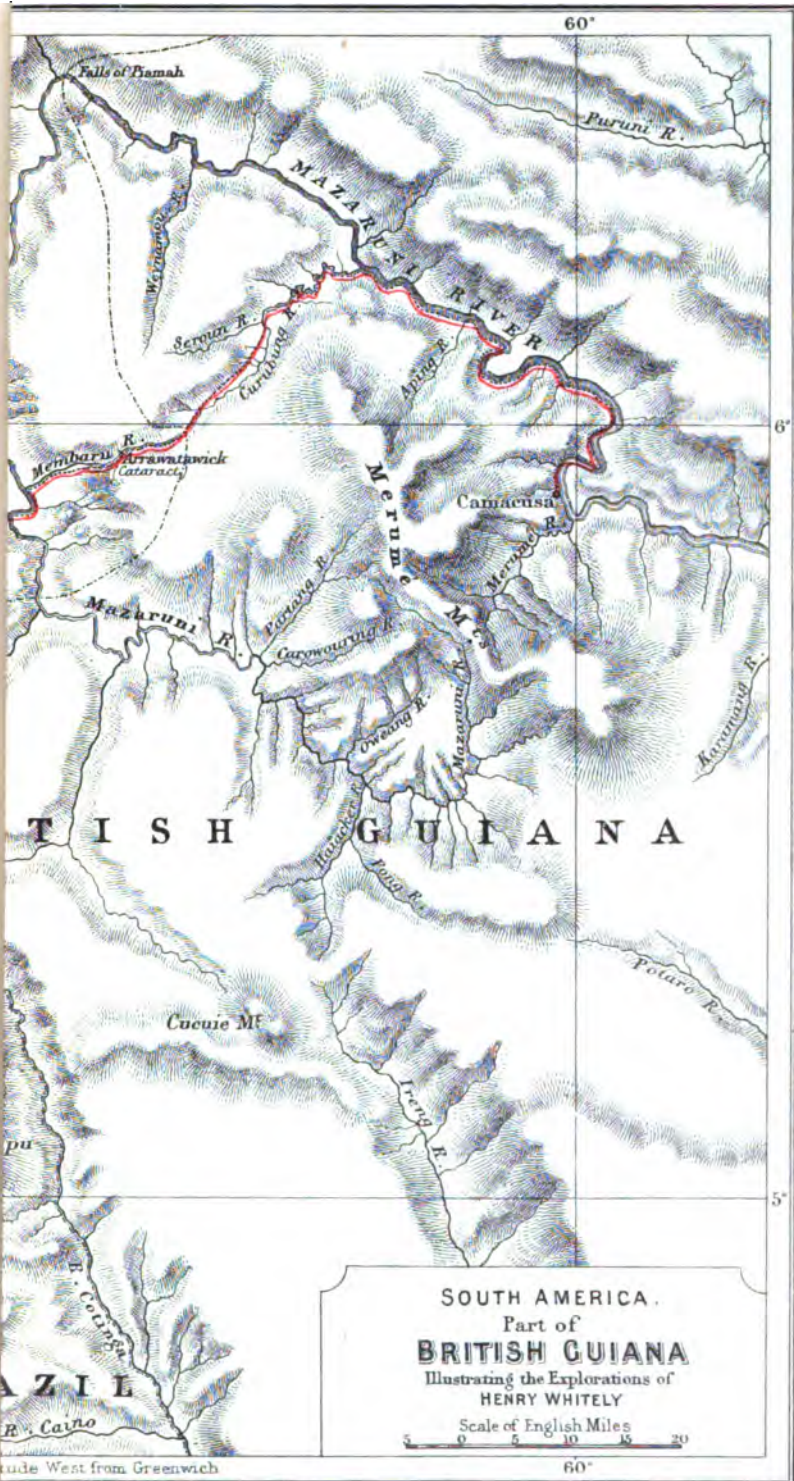
Letts, Son, & Co.—Letts's Popular Atlas, being a series of maps delineating the whole surface of the Globe, with many special and original features; and a copious index of 23,000 names. 156 maps. Complete edition. Letts, Son, & Co., London, 1884. Price 2l. 12s. 6d.

In addition to an unusually large number of maps, this Atlas contains much valuable statistical information on all subjects connected with commerce. Considerable judgment has been shown in the manner in which the physical features of the several countries have been delineated, and care has been taken to correct the maps as far as possible to the date of publication of the present edition. A great recommendation to this Atlas consists in the introduction of large-scale maps of countries with their capitals and environs; and for general reference in all matters connected with commercial geography it would be difficult to point to a more useful publication than this Atlas.



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PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

*The Regions of the Upper Oxus.** By ROBERT MICHELL.

(Read at the Evening Meeting, May 12th, 1884.)

“AND first,” says Purchas in his ‘Pilgrimage or Relations of the World, and the Religions observed in all Ages,’ “we must begin with Asia, to which the first place is due, as being the place of the first men, first Religion, first Cities, Empires, Arts; where the most things mentioned in Scripture were done; the place where Paradise was seated; the Arke rested; the Law was given; and whence the Gospell proceeded; the place which did beare him *in his flesh*, that by his Word beareth up all things.” The divisions which Purchas proceeds to make of Asia, are, he well observes, “not so exact as may be wished, because of that varietie and uncertaintie in those Kingdomes.”

If in a description of the world the first place is due to Asia, the first place in a description of Asia is due to that particular portion of it where the seven terrestrial paradises were located. One of these, as is maintained by Sir Henry Rawlinson, was in the valley of the Sogd, Kohik, or Zarafshan, where Samarcand is situated; some others were presumably in the smiling valleys of mediæval Chaghanian, Kotlan, and Wakhsh.

I do not know whether Karateghin may be included in this category of paradises, but as it is in the very heart of Inner Asia, I propose to bracket it with Darwaz or Wakhsh, and to devote this paper exclusively to those two provinces.

How far ancient Bactria extended in this direction is not, I think, precisely known, but we do find Alexander the Great fighting against and defeating Bactrian armies north of the Oxus, and on the eastern confines of Sogdiana or modern Bokhara. The Alexander of our age has since the year 1864 been steadily approaching from the north to this region of paradises, the fifteenth creation of Ormuzd, according to

* Vide Map of Central Asia in Part 2 Vol. I. Supplementary Papers; and of the Pamir in March No. ‘Proceedings,’ 1884.

the Vendidad, and he is now ominously near to them. On the east he already commands the sources of most of the seven life-giving rivers of Mount Meru. On the north he commands the passes into the Alai Valley and into Karateghin, and holds the valley of the gold-scattering Zarafshan. On the west he guards the entrance into the happy valleys of Hissar and Kulab from near Kitab and Shahr.

The Amir of Bokhara is old and frail, and the right of succession of any one of his sons is not guaranteed by the White Tsar. It is therefore to be expected that in due time the keys of the gates of these paradises of Inner Asia will be suspended from the girdle of his Imperial Majesty the Emperor of all the Russias.

"No place is impregnable to the brave or secure to the timorous," was the favourite maxim of Alexander the Great. There are winged soldiers like those of the great Macedonian, who scaled the rock at Derbend, even now in Asia, and the word has only to go forth for the Russian eagles to rest on all the eyries in Hissar, Kulab, and Darwaz, as on the Pamir at Kara-Kul Lake, which absolutely command the entire basin of the Oxus river from its very sources. How easy it is to subjugate the inhabitants of those regions is illustrated by the single fact that the Chinese seated in Eastern Turkistan, exacted and received from them tribute and homage which was paid without demur.

If an ethnographic line of demarcation were traced it would properly run along the Hissar range from the Alais, terminating at Kilif on the Oxus, separating as a distinct race of people the Persian-speaking Tadjiks of the mountains from the Uzbegs of Ferghana, Russian Turkistan, and Bokhara.

So long as Bokhara lasts as an independent state, no political heart is likely to beat in the mountain districts so circumscribed, but a Russian satrap in Turkistan setting the stamp of his authority over them would assuredly create a body politic in those parts, and begin by arousing and fomenting discord and animosity between the Sunni and Shiah Mahomedans who are separated by mountains rising between Darwaz and Roshan. And on the first opportune occasion, Afghanistan would be shorn of her trans-Oxus possessions.

The region to which I beg on this occasion to invite attention has until very recently been the most obscure, as it is one of the most inaccessible, parts of Inner Asia. It was a perfect mystery to the Greek and Arabian geographers, and even in the sixteenth century it was a *terra incognita* to Baber, although that illustrious monarch succeeded his father in the sovereignty over the neighbouring country of Ferghana and ruled in Samarcand, where, in his time, "there was an observatory on the skirts of the hill of Kohik, three storeys high, and provided with an astronomical apparatus,"—"one," observed Baber, "of only seven or eight observatories in the whole world." "I once had a fancy," Baber says, "that I might go by way of Karateghin"—that is a part of the region

to which I am alluding—but he abandoned the idea, nor does it appear that even as a fugitive and wanderer in the mountains of Ferghana did he stray into those remote and dark corners of Central Asia from over which now at last the veil is being lifted.

Karateghin was so called even in Baber's time, and it has preserved its name. Not so, however, the district bordering it on the south—now called Darwaz, which was but vaguely known in former ages as Wakhsh.

Karateghin with Wakhsh or Washjird, Kotlan (now called Kulab), and Hissar, which are now dependencies of Bokhara, formed part of the broad territories of Kosrou-Shah, Baber's arch enemy, who in the end, according to Baber himself, was reduced "in the space of half a day, without battle, without contest," with the aid "of only 200 or 250 tattered-demons," to a condition of abject misery.

Before the year 1878 no European traveller had set his foot in this country. Chinese travellers skirted it on the north, and Portuguese and Genoese passed either far to the west of it through the Castle of Gog and Magog, first mentioned in the prophecy of Ezekiel in reference to the desolating hordes of Scythians who had made repeated inroads into Persia and Assyria, or to the south of it by way of the southern sources of the Oxus.

On Waddington's map of 1826, notwithstanding the marvellous amount of knowledge acquired and so well marshalled by that distinguished geographer, Karateghin and Darwaz were left to the imagination. Kiepert's map to Ritter's Asia (1852) showed a great improvement indeed, resulting from a digest of subsequently revealed itineraries. Here, already was the Wakhsh or Surkhab river traced down to the Oxus from the mountains south of Kokand or Ferghana, made, though it was, to appear even as the main stream of the Oxus itself. But Darwaz was still lamentably out of place. On Arrowsmith's map of 1872—that attached to Sir Henry Rawlinson's 'England and Russia in the East'—there was a still more marked improvement, while there was yet a falling off and a retrogression similar to that which we discern on General Walker's map of 1881, when we compare it with the one published by him in illustration of Sir Douglas Forsyth's mission to Yarkand in 1873. All these maps, as touching Darwaz and Karateghin and the Western side of the Pamir, are "lights of other days," and require reconstruction.

We cannot, I think, blind ourselves to the fact, and we ought candidly to admit, by way of returning the compliment, that by far the best maps of Central Asia are those which are now produced at St. Petersburg. Englishmen have indubitably laboured more to unravel the tangled web of conflicting ancient and modern data, and no one in this respect has excelled Sir Henry Rawlinson and Colonel Yule; but a journey or two, easily performed under protection and in perfect

security, has enabled Russians in a few months to establish facts which were being slowly though surely realised by English geographers by means of the closest investigation of topographical and historical records.

Darwaz and Karateghin, together with Hissar and Kulab, are provinces of Bokhara. They are all separated from Bokhara proper by mountain ranges of considerable altitude, and they are not very easy of access from the north. For all that, they were, when occasion arose, subjected to the rule of the Amir of Bokhara without much trouble. The *Sarbaz* occupied Kulab, Darwaz, and Karateghin without any opposition worthy of the name, and the *Nuker* holds it without any apprehensions of rebellion. The reason of this, on close inquiry into which I need not enter here, will not be found to be very perplexing. It may be admitted that Karateghin, Darwaz, and Kulab did indeed, in a certain sense, possess an independence under their own native hereditary shahs; but that independence must not be supposed to imply strength, nor should it be imagined that under their own native chiefs the people were happy and contented. The account which has been given of the *Galchas*, or "poor wretches," of Darwaz and Karateghin by Mr. Arendarenko impresses us with the conviction that they have for the first time known real contentment and happiness, and in this truest sense independence, only since the removal of their own tyrannising and extortionate hereditary rulers. They have, it is true, no longer a separate political existence, but they are, it seems, in consequence of that, free from the cruel and terrible vicissitudes of political life. There is amongst them a complete cessation of internecine feuds; the several districts, formerly under separate governments, no longer prey upon each other, and there is harmony and apparently a freer intercourse between the several populations.

With the cessation of all political jealousies the Russian traveller now enjoys perfect immunity from those dangers, engendered by political intrigues, to which Europeans—mostly Englishmen—have elsewhere and on various occasions fallen victims. In no part of the world, perhaps, is there a people more docile or tractable than the inhabitants of Inner Asia, but nowhere has the life of the foreigner so entirely depended on the caprice or cunning calculation of the unscrupulous independent or semi-independent chieftains. The centre of government is now far away outside the confines of the several valleys which compose these hill districts; there is no rivalry for power either between individuals or clans; the hereditary rulers are shelved; there is no false political patriotism, common to the Kirghiz, the Galchas or Tadjiks, and to the Uzbegs, deriving its baneful inspiration from an arbitrary and restless central figure within the region.

The Amir of Bokhara has judiciously disposed of the brotherhood of rival native chiefs; he has not patched up an incohesive State which would be weak and perpetually agitated within, and inviting attack

while subject to intrigue from without; he has not ventured to form out of an agglomeration of distinct valleys a "strong, independent and friendly" State on his borders, knowing doubtless from an example on the other side of the Oxus that such a combination would be fraught with danger, and would lie at the root of much evil.

The flood of light which has been thrown over the regions of the upper Oxus is a result of labours performed in the seventh decade of this century by various travellers. Messrs. Johnson, Hayward, and Shaw, in 1867, gave the first impetus to these explorations, and were followed by the mission of Sir Douglas Forsyth to Kashgar in 1870 and 1873. These enterprises gave a stimulus to Russian exploration from the north. My friend the late and much lamented Fedchenko, accompanied by his wife, broke ground from the side of Ferghana in 1871, rendering most distinguished services to geographical science and to natural history. After him, in the year 1876, the conquest of Kokand enabled the Russians to plunge into the country of the Pamirs with a military expedition led by the late General Skobelev.*

These journeys, missions, and expeditions were all consequent on the formation of an independent Mahomedan State in Eastern Turkistan by Yakub Beg, of Kashgar. One of the incentives in the matter of this laudable rivalry between ourselves and the Russians to unravel the few remaining mysteries of Central Asian geography was doubtless a political anxiety, on both sides, to determine the respective limits of the dominions of the Amirs of Afghanistan and Bokhara.

Elphinstone's mission to Cabul in the early part of the present century is perhaps the proper foundation of all our knowledge of the geography of Central Asia, and Wood's journey to the sources of the Oxus, coupled with the travels of Moorcroft and Trebeck and the explorations of Mir Izzut-Ullah, contributed to the erection of a large geographical superstructure. The labours of Gordon and Trotter, who have so greatly distinguished themselves, and who were really the first explorers of the Pamir after Wood, were supplemented by those of the Havildar and of the Munshi Abdul Subhan. In the year 1879 a native Indian gentleman, known to us only by the initial letters M—S—, executed a survey, to which I shall have occasion to refer further on.

The results of the numerous Russian surveys of the Bam-i-Dunia (Roof of the World), as we have been taught to call the massive elevations in the region of the Upper Oxus, and of the upland provinces of Bokhara in the intricate elevations which unite the Thian-Shan with the Himalayan mountain systems, are to be found in the writings of Messrs. Mayef, Arendarenko, Mushketof, Severtsof, Oshanin, and Regel, some of which have been translated † and published in the Journals and Proceedings of the Royal Geographical Society.

* Journ. R. G. S., 1887.

† 'Proceedings Russian Geographical Society,' Part I., for 1881.

Mr. Oshanin's paper on Darwaz and Karateghin has not yet had full justice done to it. I will therefore refer more particularly to him, since Captain Kostenko, in his recent work on Turkistan, has used his memoir without the slightest acknowledgment,* bearing constantly in mind that I am humbly following in the footsteps of those Nestors of geographical science, Sir Henry Rawlinson and Colonel Yule.

The results of Colonel Matveyef's journey to Faizabad in Badakhshan are still an unknown quantity. Taken in conjunction with the accounts of the various Pamir and Hissar expeditions, and with the information gathered by Colonel Grodekof on his ride from Mazar-i-Sharif to Herat in 1878, the amount of the Russian gleanings is very considerable. We have our own sources of information published to the world; but of a public as well as of a "secret and confidential" nature the Russians, since the years 1878 and 1879 in particular, have without doubt accumulated enough to dispel all but a few lingering doubts.

The late Mr. Fedchenko recorded in his 'Travels in Turkistan' his expectation and his hope that the exploration of the Pamirs would be finally effected by his own countrymen. He believed this would be the case because the Pamirs are much easier of access from the north than from the south. He observed that Englishmen attempting to reach the Oxus basin from India would have to traverse a broad belt of mountains, occupied by barbarous and hostile tribes, whereas a Russian, journeying from the north, would encounter no insurmountable difficulties, and might lay any wager that he could cross from Tashkend to Wood's Lake and return within the space of one month. Even in Mr. Fedchenko's time the Russian influence with the Amirs of Kokand and Bokhara was sufficient to secure a safe-conduct to travellers to the uttermost confines of their dominions. Since the Russian annexation of Ferghana, together with the outlying region of the Alai, the facilities afforded to Russian surveyors have been of the greatest.

Darwaz and Karateghin are situated between $69^{\circ} 30'$ and 72° E. longitude of Greenwich, and between 38° and $39^{\circ} 30'$ N. latitude. Karateghin occupies the middle course of that largest tributary of the Oxus which flows from the northern limits of the Pamir table-lands under the names of the Kizyl-su, the Surkhab, and the Wakhsh. Darwaz occupies the middle course of the Panj, or main head-water of the Oxus, and it embraces, in the direction of Karateghin on the north, the valley of the largest tributary of the Surkhab, called the Wakhia-Bala,† the Khulas, the Wakish, and the Hing-ab.

These two provinces of Bokhara are walled in on all sides, and separated each from the other by chains of snow-capped mountains, averaging in height from 16,000 and 18,000 feet above sea-level on the north-east, east, and south, to about 10,000 or 12,000 feet on the west.

* This has been complained of in the Russian 'Geographical Proceedings'.

† Bala means *Upper*.

From no one single point of the compass are these "Zindans," or strongholds, as the natives call them, to be entered but by clambering over the most "tooth-breaking" passes, as some of them are called in that quarter of the globe, or by trudging over glaciers and frost-crueted snows. The camel has no home within these fastnesses; even the *ishak* or sure-footed mule is as great a rarity there in a live state, as is a dead donkey anywhere else. The goat on the other hand is common, but as that animal never "gives a back," locomotion through Darwaz and Karateghin is mainly pedestrian. The horse is only the luxury of those in Darwaz and Karateghin who can afford to have a wife or two, that is, of the "Galchas" or Tadjik, "poor wretches." For all that, however, travellers have not been deterred from following the more direct routes from Badakhshan to Kokand; thus Abdul Mujid gave us an account of his passage from Kokand through Karateghin and Darwaz in the year 1861. And notwithstanding the barriers at all corners of Karateghin and Darwaz, immense herds of sheep and droves of cattle are driven up over hundreds of miles of difficult country, from the west—from Baisun in Hissar, to graze in the grassy valley of the mountain-locked Hing-ab river.

The section of the Surkhab basin which is occupied exclusively by Karateghin is 100 miles in length from Kchi or Little Karamuk, as distinguished from Katta or Great Karamuk on the eastern side of the passes—where the river emerges from a gorge,—down to the mouth of its affluent the Ab-i-Gharm. On the north this little province is bounded by a range of mountains uniting at its eastern extremity with the Alai Mountains, or, as Fedchenko called them, the South Kokand range. This range forms the water-parting of the Jaxartes and Kizyl-su or Surkhab river systems.

At the eastern extremity of the Zarafshan glacier we find a mountain knot which has been called Kok-su * by the Russian Baron Aminof. Three ranges radiate from this knot—the one just alluded to, another called the Turkistan range, separating the Zarafshan from the Jaxartes, and the third called the Hissar range, which separates the Surkhab valley from the basin of the Zarafshan. Baron Aminof gives a height of from 18,000 to 19,000 feet to this Kok-su mountain knot, but it has not yet been seen by any European, nor has the eastern spur between the knot and Karamuk been crossed by a Russian explorer. Mr. Fedchenko in his endeavour to ascend the Kara-Kazuk Pass was deterred by terrifying stories of robbers told to him by a Kokand Yuzbashi, who professed an anxiety for his safety. And Mr. Oshanin, who visited Karateghin in 1878, was to his great disappointment prevented from ascending the Alaudin Pass from the south, a difficult pass which occurs to the west of the Kara-Kazuk. There is according to Mr. Oshanin an intervening

* Oshanin objects to this as an impossible name for an elevation, the meaning is "earthy water."

secondary range of mountains immediately overhanging the valley of the Surkhab, which extends from a peak called Shumkara between the Kok-su affluent of the Kizyl-su and the head of the Zanku tributary of the Surkhab. This range extends to the western confines of Karateghin, where it is said to break up into ramifications parting the Ab-i-Gharm river from that of Kafirnihan. This range is pierced by the three largest tributaries of the Karateghin river, rushing southwards from the main range; the minor affluents of the Surkhab having their sources in the southern declivities of the secondary range.

On the south Karateghin is bounded by a range called Peter I., in honour of the Russian Tsar who gave Russians the "key to the gateway of Asia." This range, averaging in height some 14,000 or 15,000 feet, extends from a group of gigantic peaks at the sources of the Muk-su river, called Shilbelli,* Sandal, and Muz-jilga, to the western confine of Karateghin.

Karateghin is locked by mountains at both its eastern and western extremities, and the road into this valley from both ends, instead of passing up or down the banks of the river, leads over numerous passes of considerable altitude. Perhaps the two easiest points of ingress from the north are at Gurumdu in the east and Pakshif in the west—the one accessible from Ferghana, the other from the valley of the Zarafshan.

The valley of the Muk tributary of the Surkhab is a deep and gloomy defile; and the same may be said of the Surkhab from Karamuk to the mouth of the Muk. The valley of the Surkhab consists of a series of hollows or expansions, closed in by projecting spurs of mountains on both sides of the river, therefore the single road through Karateghin presents many of the same forms of ingress, and each hollow is as it were a little Karateghin in itself. We have been taught to believe that in order to traverse Karateghin and Darwaz, one has to crawl and scramble up and down the rocky mountains and along the edges of precipices, and that in order to get to the opposite sides of yawning chasms one has to swing from basket to basket, transferring oneself bodily and with the greatest agility to the opposite brink. But this is not the fact, and one need not be an acrobat to travel in those regions. This fable arose from exaggerated and distorted accounts of the very frail and swaying bridges or balconies of a primitive kind which are here and there patched up to facilitate traffic. Although the roads are none of the easiest, it is nevertheless found that men in detachments of thirties, fifties, and even hundreds, can stream through the country without let or hindrance.

These hollows or expansions in the Karateghin valley are very remarkable, appearing at some remote period to have been a series of

* We find Shilbelli in Abdul Mujid's itinerary, but I cannot make out how he passed that locality when travelling southwards through the Karateghin valley to Gharm.

lakes, for on the terraced clayey sides there is ample evidence of a high-water level. There are three bridges over the Surkhab, at Divana and Dombrachi near the mouth of the Muk, and one at Pul-i-Sengi * at the western confine. There is no boat on the water, and if a man has any business to transact on the opposite side he must swim across by the aid of a *gupsar*, or inflated cow's-hide. The only place of note is Gharm, the capital, which contains only about 100 dwellings, and has no bazaar.

Every patch of ground suitable for cultivation is turned to account by the native Tadjiks with the greatest care and assiduity. He ascends with his oxen to a great elevation to till and to sow. From off every available patch of soil he gathers a harvest of wheat and barley, exporting most of the grain to Ferghana and finding nourishment for himself principally in the mulberry, which he dries and converts into a paste. But he also indulges in other fruits, such as the peach, the apricot, the cherry, the apple, the pear, and the quince. Wild berries and fruits are likewise in great abundance in the mountains of Karateghin. The walnut grows there, but the fig and the pomegranate do not favour those high latitudes. The population of Karateghin is roughly computed at about 10,000.

The eastern extremity of Karateghin down to the Zan-ku tributary is occupied by the nomad Kara-Kirghiz, who have been gradually driven up farther and farther into the mountains by the Tadjiks. Who these Tadjiks are is a matter of highly interesting speculation. Some say they are of the original Aryan stock; they themselves boast of being only the descendants of the hosts led into Asia by the great Iskander. If the Garden of Eden was indeed in this corner of the globe, then the nature of the country must have been something very different from what it is now, and the climate must have been tempered by a vast ocean extending to the very base of that stupendous elevation known to us as the Bam-i-Dunia. I will not venture to say more on this point but I would observe, in reference to the common belief among the Tadjiks in their descent from the remnant of Alexander's followers, that while it may be discredited as applying to the bulk of the people, it is not improbable that the headmen or hereditary governors of the people may have been descended from some of the captains of the great conqueror's cohorts. And it may be that in course of time, through the fusion of the multiplying families of the chiefs with the native race, every individual as he ranked himself under his lord's banner adopted the belief that he sprang from a race of heroes. Most men of eminence or note throughout Central Asia pretend to trace their pedigree from the great Macedonian conqueror.

The Tadjik or Burgess is totally distinct from the Uzbeg Tartar. He has straight, fine black hair, and sunken eyes, black and lively, and a straight nose. The beautiful Roxana, who together with her father

* Where Colonel Yule at last found the long-lost bridge.

was taken captive by the Macedonian conqueror, was probably of the Tadjik race.

According to Strabo, Arrian, and other Greek historians, Roxana was a Bactrian maid, a daughter of the Bactrian chief Oxyartes, who defended that impregnable rock which appears to have been Derbend in ancient Sogdiana. The Tadjiks may therefore be descendants of the ancient Bactrians, who were routed and dispersed by Alexander's armies. Bactria, to a large extent depopulated, being subsequently made a place of banishment.

Darwaz is entered on the west in two ways, by a road leading up the Panj from Zikhar below the mouth of the Kofau or Kufau to Kila-Khumb, and by way of the Khulas or Hing-ab and the Saghri-Dasht valley and pass. There is no road along the Panj below Zikhar.

The valleys of Darwaz are those of the river called by Dr. Regel Wakhia-Bala above, the Khulas in its mid course, and the Wakish towards its mouth; * of the Khumbou, Wanj, Yaz-Ghulam, and others. From the south we observe that the Panj within the Darwaz territories is said to receive a very considerable affluent in the Kofau, flowing through Shiva in northern Badakhshan a course of some 100 miles. This is an interesting but not quite a novel feature, although we have not observed it on any map since the year 1826, when that river seems to have been traced on Waddington's map attached to Erskine's and Leyden's *Memoirs of Baber*. This river on Waddington's map is made to fall into the Panj, where we now find Kof; but Waddington confounded it apparently with the Faizabad river—the Kokcha, and the Kokcha again with the Kunduz river. Thus while Waddington left out one river, we have since reconciled the omission with known facts by bringing his Kokcha down south to serve as the real one. It would appear then, from this, that the Kofau is a re-discovery.

General Walker traces a very remarkable Shiva river about 100 miles in length due north and falling into the Panj opposite to Kila-Khumb, the capital or citadel of Darwaz; but M—S— (the Indian native gentleman already alluded to) does not say a word about the matter. Dr. Regel's map in the 'Proceedings' for March 1884, looks very much like a modification of General Walker's in this respect; and one is naturally curious to know whether Dr. Regel consulted Waddington's map in drawing up his "croquis," for, as I have just said, we do not find any trace of this river in any of our maps since the year 1826.

True, it is still found on Burnes' map by Arrowsmith, 1834, as a result of Elphinstone's mission to Cabul. There is a suspicion of it again in Wood's original work on the Oxus, and on Moorcroft's map, where it is called Shiva, but we have ignored it since, although Burnes and Moorcroft appear to have ascertained the existence of the Shiva river for themselves; and even Humboldt in 1843, and Ritter in 1852,

* Mr. Arendarenko says that this river bears the single name of Hing-ab.

relying on English authorities of those later periods, left that river entirely out of their calculations.

The largest valley in Darwaz is that of the river which we have been recently told is called the Hing-ab. The length of this river is said to be about 167 miles; if so, its sources would lie east of the head-waters of the Muk, in the direction of Kara-Kul Lake. This valley has not been explored, but it has been crossed at Childara and at Tavildara, where the river is bridged. The valley lies between Peter the First Mountains and the Darwaz* range. Before reaching the Surkhab this river forces a passage through a gorge, through which the road is not always practicable. In the Khulas or Childara section of the valley there is a smiling prospect, and every appearance of prosperity; vast meadows carpeted with the most succulent grasses; human habitations sprinkled about in the shade of luxuriant orchards yielding luscious fruits. The scene here is one of pleasant animation and of happy contentment. The laborious Tadjik is either garnering his grain or enjoying in his loved orchard the repose he has so well earned after the terrible hardships of a long and severe winter, when he was out for weeks hunting in the mountains to procure a quarry for a high festival. His long-haired goats stray over the hill-sides, and below in the alluvial pastures are the numerous shepherds with their immense flocks. From the pass at Tavildara is a view of the whole length of the lower part of the valley, and all around is a grand panorama of gigantic mountains patched with everlasting snows, with here and there a beetling elevation, and far away in the east, closing the valley in the dim distance, the shadows of leviathan peaks, with a glimpse here and there of the glittering edge of a glacier, whose great bulk is hidden in some gloomy recess of the mountains.

The next well-to-do valley, isolated like all the rest, is that of the Saghri-Dasht, affluent of the Hing-ab. It must be passed through and climbed down into on the way to Kila-Khumb, where we are in the valley of the great Panj, or main head-branch of the mighty Oxus, or Jaihun of the ancients, the Amu-Daria of the Russians and Central Asiatics. Kila-Khumb is the residence of the Bek of Darwaz. The possession of Kila-Khumb was ever an apple of discord between the former native shahs of those regions. The citadel stands on an elevation commanding the river; there is no crossing the Panj here, except by swimming with the *gupsaar*.

The valley of the Panj is hemmed in by rocky mountain sides, and there is said to be but little cultivable land along its banks, though habitations are scattered about, nestling in those orchards which are the Tadjik's only delight.

We now come to the Wanj, a river whose sources are to be sought in the western declivities of the Bam-i-Dunia. This river was ascended by

* So called by the Oshanin expedition in 1878.

some of Dr. Regel's companions in 1882, but communications, though suspected, were not established as a fact between the upper valley of this river and the valley of the Hing-ab, nor has the correctness been ascertained of Captain Trotter's surmise that there are tracks leading up to the Wanj valley from Shughnan, flanking Darwaz on the north-east. This in Mr. Oshanin's opinion, is most likely to be the case; and seeing the curve described here by the Panj river, according to Dr. Regel, and the difficulty of following the road along the river, Captain Trotter was probably justified in his conclusions.

At the mouth of the Yaz-Ghulam and at Varv, we reach the south-eastern limits of Darwaz. Varv, where M—S—, as well as the Havildar before him, was stopped, is placed by both those native agents exactly opposite to the mouth of the Yaz-Ghulam tributary of the Panj. Here is the mouth of that gorge which severs all communication along the Panj between Darwaz and Roshan, or, in other words, through which alone Darwaz communicates with Shughnan—Roshan being an integral part of Shughnan and appertaining to the Amir of Afghanistan.

There are no two opinions as to the position of Varv. M—S— ascended as far as Varv and then came down the Panj to Varv, supplying the "missing link."

On Dr. Regel's map, where we find a most eccentric loop of the Panj, which considerably lengthens the river and the distance between Kila Wamar and the mouth of the Vanj, the Yaz-Ghulam mouth is pushed high up and Varv is elbowed far into the Shughnan and Badakhshan territories of Afghanistan, as a possession of the Amir of Bokhara. I have just heard that another batch of papers has been received at St. Petersburg from Dr. Regel, who is now again exploring the regions of the Upper Oxus, so that we may expect something of great interest in the course of a month or so.

Another point of difference between General Walker's latest map up to 1881 and that of the Russian surveyors is the re-conversion of the Pamir river, the Ak-su, into a head-water of the great Murghab. M—S—, ascending the Murghab to Seres, found there that he had reached the very source of the Murghab, and that beyond Seres towards the east rose an obstructing ridge of mountains with a pass. I quite expect that Captain Trotter's projection in this respect also will be fully confirmed by the Russian surveyors.

Even yet no one attempting a description of this part of Central Asia should omit some reference to the apocryphal geography exposed some twenty years ago by Colonel Yule, the late Lord Strangford, and Sir Henry Rawlinson; but I dare not venture so far beyond my depth as to do more than allude to it, referring all who are interested in this matter to Sir Henry Rawlinson's 'Monograph on the Oxus' and Colonel Yule's paper in the 'Journal of the Royal Geographical Society' for 1872, and to his introduction to the new edition of Wood's 'Oxus.'

In introducing the author of the paper,

The PRESIDENT said that Mr. Michell, although an Englishman by family and nationality, was born in Russia and had lived a great part of his life there. He had travelled a good deal through that country, and had kept himself acquainted with the progress of geographical discovery in Russian Asia. The subject of the paper was a country that up to the last six years had never been explored by Europeans. It was the cradle of the human race, and from there the great Aryan race from which Englishmen were descended issued forth.

After the paper,

Sir HENRY RAWLINSON said the subject for discussion was a very large one, inasmuch as it included the physical as well as the political geography of a tract extending over some 400 or 500 square miles. The districts of Darwaz and Karateghin, which formed the subject of Mr. Michell's paper, had been described as a sort of "Debateable Land" between the Aryan and Turanian nations. There was no sharp line of demarcation separating the two nationalities, for the aborigines, or indigenous peasantry, even to the east of Darwaz and Karateghin, were of the Aryan race, while the dominant tribes throughout were Turkish; but in a general way it might be said that the region between the Surkháb (or Wakhsh) and the Oxus was the barrier which divided the settled Aryan cultivators from the Turanian nomades.

And through this region, which was the "Vallis Comedarum" of Ptolemy, passed the great trade route which extended in antiquity from the Mediterranean to China. Ptolemy, it was well known, following Marinus of Tyre, had traced this route in some detail from Syria, through Western Asia, to Bactra or Balkh, in a general direction of east and west, but at the last-named place he carried the line northward, ascending the western slopes of the Mountains of the Comedæ to the famous "Stone Tower," where the caravans assembled before descending on the other side into the great desert, which extended from that point to the confines of China. Geographers had disagreed as to the exact line by which Ptolemy had carried the route across the mountains from the valley of the Oxus to the Central Asian depression, but if we consulted history and applied the lights which it furnished to the physical geography of the country, we should, he thought, be satisfied that the true trade route was up the valley of the Surkháb, and then along the northern skirts of the Pamir to the Terek Pass, the "Stone Tower" being probably at Uzkend or at some point in the basin of the Jaxartes.* The best proof of this was that the lower part of the valley of the Surkháb retained the name of *Kumid* down to comparatively modern times; it appeared under that name (Chinese *Kiu-mi-tho*) in the travels of the famous Buddhist pilgrim Hwang-tsang in the seventh century, and again some centuries later in the geography of Ibn Dust. During all this period also it formed the high road of transit from the valley of the Jaxartes to that of the Oxus. So exclusively indeed was it used for this purpose, that in order to arrest the immigration of the Turkish nomades, Fadhl Ibn Yahya, the Barmecide vizier of Harún Ar-Rashid, erected in the ninth century of Christ a strong fortress at Rasht, in the vicinity of Garm, the capital of Karateghin, so as to dominate the passage along the valley.† The ambassadors of Shah Rukh, on their return from China to Herat,

* Gen. Cunningham first identified the Comedæ of Ptolemy with the *Kiu-mi-tho* of the Chinese, and Col. Yule has approved of the identification, but supposes the valley to have extended along the Panj through Darwaz as far as Roshan. There is, however, no practicable road, at any rate no high road, in this direction. It is only along the valley of the Jaxartes that a convenient passage is found from the Surkháb valley to the eastward.

† Ibn Khurdád-beh, the Postmaster, is the first authority for this statement, and he was followed by Edrisi and Yacút, and by Ibn Saïd, who states that the fort was named

followed the same route; and it was repeatedly mentioned in the memoirs of Baber as the best road through the mountains from the Jaxartes to the Oxus.* But there were also two other routes from west to east by which the Pamir could be crossed. The one led up the valley of the Ghand river from Shignán by Alichur and Riáng-kul direct to Kashgar, forming the line of retreat by which the Badakhshan forces sought to escape from Shah Rukh's attack in A.D. 808, as related by Hafiz Abrú; and it was along the same line that the Chinese forces from Kashgar pursued the Khojas on their rapid flight to Badakhshan in the middle of the last century.† The third route across the Pamir was the southern line leading to Yarkand by Wakhan and Sarik-kul or Tash-Kurghán, and well known to geographers from the travels of Marco Polo and Benedict Goetz, and more recently from the surveys of Lieutenant Wood and the officers who accompanied Sir Douglas Forsyth's mission to Turkistan.

He would now give a brief explanation of the names of Karateghin and Darwaz. The title of Karateghin, applying to the valley of the Surkháb, was first met with, as far as he was aware, in the account of the wars of the Emir Timúr, and he presumed that it was taken from the name of some local governor; ‡ while Darwaz, which in Persian meant "The Gate," was the specific name given to Fadhl's fort which guarded the entrance to the country from the north. How it happened that the name of a fortress situated to the west of the Wakhsh-ab should have been made to apply to a wide extent of mountainous country stretching at least 100 miles to the east of that river was not very easy of explanation, but the fact was undoubted. The name indeed seemed to have migrated to the eastward as early as the time of Timúr, for the Dereh Darwaz mentioned in the wars of that sovereign as the abode of Shah Jelaledin, who refused an asylum to the rebel Prince Mireké when expelled from

El Báb, "the Gate." See Reinaud's *Abulfeda*, Int. p. 161. Ibn Athir merely states under A.H. 178 that Fadhl built several mosques and *robáts* during his government of Mawerennahr, but does not particularise Rasht.

* See Leyden's *Baber*, pp. 68, 125, 127, &c.

† Major Trotter (*Report*, p. 279) says:—"The desert road to Kashgar (from Badakhshan) up the Ghand valley is said to be a much easier road than that by Tash-kurghán." Hafiz Abrú's account of the retreat from Badakhshan by the Ruby Mines, Shignán, and the Ghand valley to Pamir, was copied into the famous *Matla'a-es-Sa'adin*, and translated by Quatremère. See *Not. et Ext. des Mau.*, tom. xiv. p. 223. It is quite possible that Hwang-tsang may have followed the same route, *Ta-mo-si-l'ie-ti* being Shignán rather than Vakhan and *Ko-pan-t'o* (or *Khavandha*) being the true form of Ghand. This would explain the mention of the "Dragon Lake," or Kara-kul, otherwise entirely off the line. Observe also that *Ta-mo-si-l'ie-ti* has the alternative Chinese name of *Chin-kan* and that *Ko-pan-t'o* is explained in *Dictionary* as *Arachul*, i.e. Alichur (Pamir). What is wanted to confirm this identification is the discovery of Buddhist remains at the upper end of the Ghand valley. Ghand is also the *Ghanda-mis* of Ibn Fakhri, the source of the river Jyhún. See Yacút in voce Jyhún. Major Trotter, (in Forsyth's *Report*, p. 457) gives a detailed account of this road across the Pamir (Route XXVII.), which I have compared with an ancient Chinese Itinerary, preserved by Klaproth, in a recent number of the 'Geographical Journal.' It is, I may add, quite possible that the old trade route by the "Vallis Comedarum" crossed the Pamir plateau by the line of the Ghand river, in which case the "Stone Tower" would be represented by *Tash-bálik*, "Stone town," where there are said to be extensive ruins.

‡ *Hist. de Timur*, tom. p. 174. The Prince Kai Khusru, of Khotlan, is said to have fled to Alai by the way of Cair Tekin. There were many chiefs of this name under the Samanides and early Seljukians. The best known died at Bost in A.H. 317, and was buried in the Robot Kara-tegin at Isfijáb. He was for some time governor of the country between Chaghanian and Ferghanah, and probably bequeathed his name to the province.

Khutlán (Kulab) was almost certainly the modern Kileh Khumb, the country being thus shown to have been ruled by semi-independent chiefs as early as the fourteenth century.* It was curious also to observe in the most recent Russian map, that the name of Mount Darwaz applied to the hills between Ab-i-Garm and the Wakhsh-ab, where "the Gate" of Fadhl the Barmecide was originally built; and seemed to be quite independent of the province of Darwaz to the east.

Another name which had given rise to much confusion in the geography of this region was that of Panj or Panja, the former being probably the correct orthography. The word meant "five," and was popularly supposed to refer to the five streams which formed the Upper Oxus, the main stream being known by that designation as far down as the junction of the Kokcha, or river of Badakhshan. The identification of these five streams however was quite uncertain. The early geographers Istakhri and his copyist Ibn Haukal mentioned, it is true, five streams which united with the Wakhsh-ab to form the Jyhún or Oxus, and which they named the Khari-ab, the Andija-rágh, the Farghán, the Barban, and the Hulbuk or Akhshwa; and it was in deference probably to this tradition that later local writers, like Hafiz Abru, repeated a statement to the effect that "In the neighbourhood of Khotlan and Wakhsh, five large streams unite, on which account the place is called Panj-ab," but Istakhri's authority in this matter was really of the least possible weight. He confounded, in the first place, the Khari-ab or river of Badakhshan (modern Kokcha) with the Panj or Wakháb, the true Oxus, and he further mistook the two arms of the Panj, which bifurcates below Simti, for two distinct and independent streams. It was in fact pretty certain that he had laid down his five rivers from a sketch of the high road leading from Badakhshan to Hulbuk, the capital of Khotl, namely two stages from the ford of the river to Rustak on the Andija-ragh; one stage by Chai-ab to Farghan on the left loop of the Panj; one stage to Barban on the right loop about Sayat; and one stage more to Hulbuk, a place which still preserves its name, a few miles to the south of Kulab.† But it was quite possible that the

* The Shah Jelal-ed-din, who is mentioned in this passage of the 'History of Timur' (tom. ii. p. 12), seems to have been a local and semi-independent chief, who guarded the Tibet frontier, and the title of Shah is retained to the present day by the native family which holds Darwaz under the Bokhara Government. There is not, however, any special defile now recognized as the Dereh Darwaz, though the name is often used by Colonel Gardiner in his apocryphal travels. The name of Kileh Khumb, which applies to the residence of the chief on the river, is said by the Russians to be derived from a certain colossal "jar," or *khumb*, which formerly existed on the spot. The same story is told of the pass of *Khumb-ah*, on the road between Herat and Sarakhs, and is probably of great antiquity, for in the Zoroastrian Cosmogony one of the seven immortal lords of *Khuniras* is named *Khumbya*, because he was brought up in a *khumb*, or "jar." Bundehis, Chap. xxix. s. 5.

† It is quite certain that Istakhri had no acquaintance with the bend of the Oxus between the mouth of the Kokcha and Wakhán, but believed the river which joined the Wakhsh-ab above Termid to be the true trunk-stream which rose in Tibet and came down through the valley of Vakhan. He thus repeatedly says—and he is implicitly followed by Ibn Haukal—that Badakhshan was on the *Khari-ab* (if that is the true form of the name), and he calls the passage of the Khari-ab "the ford of Badakhshan." He further describes Khutl as between the Wakhsh-ab and the Khari-ab, and says that he includes Khotl in Mawer-en-nahr, because it was beyond (i. e. to the north of) the Khari-ab, which was the true Jyhún. With this clue then, we can understand his classification of the five rivers. The Khari-ab or Kokcha was No. 1. The next river, or No. 2, was the Rustak stream, joining the Panj at Yungi-kileh, and this he calls Andija-rágh, from the district of Rágh in which it rose. Mokadassi states that there was a town of Andija-rágh on the Oxus, which should thus be at or near the modern Yangi-kileh. Rustak

name of Panjab was not originally intended to designate any particular number of subsidiary streams, but merely to indicate in a general way the numerous affluents which formed the great river; for the celebrated Biruni had left it on record that the Upper Oxus was known to the Zoroastrians as the region of the "Seven Rivers" (thus recalling to mind the Hapta Hindu of the Vendidad), from the multitude of its tributary streams.* Major Trotter, who tested the local traditions on the spot, was in doubt whether the name of Panj was derived from the five small inclosures constituting the group of villages called Kiléh Panj at the junction of the two upper Wakhán streams, or whether the true form was not rather *Panjeh*, the river taking its name from a rude but conspicuous sculpture in the vicinity representing the hand of Hazrat Ali (*Pasjeh*), and greatly venerated by the Wakhánis.† Sir Henry added that in his own view the name of Panj really referred to the five head-streams of the Oxus, which he recapitulated as (a) the two streams of Wakhán, namely, that issuing from Wood's Lake and the Sirhad river; (b) the two streams which formed the Suchán, namely, the Shakh-dereh river to the south, and the Ghand river to the north; and (c) the Bartang or Murghabi river, which, as far as length and size were concerned, had every claim to be regarded as the trunk stream of the Oxus.‡

There were still some further points to be noticed with regard to Darwaz. Mr. Michell had referred to the traditionary descent of the chiefs of Darwaz from Alexander, and there were really certain arguments in favour of such a connection. Firstly, the stronghold of the chief, or Kileh Khumb, which still retained the local name of the *Zindan Iskender*, or "Alexander's fortress," appeared in the early geographers as Secandereh, the site being identified by the description that it was the only town in Khotl included in the mountains; and it was further not a little curious to observe that the district conterminous with Darwaz on the east was also

probably represents Istakhri's *Rustab-Bang*, so called from the chief who founded it (see De Goeje's Istakhri, p. 277, note c). No. 3 must be the left loop of the Panj. Istakhri calls it Farghan, from a town of that name on its banks lower down. Ibn Dust mentions this town, which he calls Barghan, and assigns to Upper Tokharistan, as it was south of the Panj, his Wakhab and the true Oxus. It was probably the same as the Chinese Po-li-ho (Farigha) which Cunningham compares with the ruined Barbara of Wood near the confluence of the Kokcha. No. 4, the Barban or right loop of the Panj, is a new discovery, and nothing is known of the name, but No. 5 will represent the lesser Surkhab or Hulbuk river of the Arabs, the upper source of which is now called Ak-su, answering to the Akshwa of Istakhri. The name of Hulbuk, or Albak, has now disappeared from the Russian map, but is well known in the country.

* See Elliot's 'Historians of India,' edit. Dowson, vol. i. p. 49.

† See Trotter's Report, p. 275. The open hand of Ali, called *Panjeh* from the five fingers, is one of the holiest emblems of the Shias.

‡ It appears that in the popular belief at Kabul, the name of Panj was supposed to apply to the affluents of the middle Oxus, and especially to the Talikán streams which form the Ak-serai and join the great river from the left below the confluence of the Wakhán, and that the idea of these internal streams forming the territorial limit of Afghanistan caused some consternation. The name of Panj, however, has never applied in history to the Talikán streams. The main river, now called Ak-serai, is known in Arab Geography (see Ibn Dust, Akhbar el Baldan, and Yacút) as the *Dharghám*,

ضرغام Greek *Δαρρυμάνης*, while the head-streams, the Bangi and Talikán, are named respectively the *Jabál-áb* and *Utar-áb*, the orthography however being doubtful. See the extract from Ibn Dust in Geograph. Mag. for 1875, p. 338. The Tokharistan rivers have been since identified and their orthography corrected from a passage in Mokadassi not before noticed.

named Roshán, which was the exact Oriental rendering of the Greek Ῥοδάνη, Alexander's favourite wife, who was here captured; and that this was not a modern name was proved by a passage in Massudi (about A.D. 930), where Roshán was joined with Khotlán as one of the earliest settlements of the Turks in this part of Asia.* Alexander was known to have crossed the Oxus at Termid, and to have taken up position in the first instance at Nautaca ("new town," as opposed to Kumduz, or "old town"), which was probably in Khotl, from whence he may very well have led the attack on Oxyartes, attracted by the proverbial beauty of the inhabitants of the district.

Sir Henry could not undertake on that occasion to discuss the comparative geography of the whole region described by Mr. Michell, but he might assist future enquirers by pointing out a few of the most important identifications. The Greek name of the Oxus was taken, no doubt, from the Wakhsh, which was the best known of the two great arms of the river, and it was worth noticing that this name of Wakhsh appertained in the upper portion of that river, not to the right or Alai branch, which was considered by the Russians to be the trunk stream, but to the left branch, which rose in the Fedchenko Glacier, and which, besides the name of Wakhsh, seemed to bear the other titles of Vakhia, Hing-ab, and Khullias, the right branch being alone known, as far as the junction, by the name of the "Red River," *Kizil-su* in Turkish, *Surkh-áb* in Persian. The Wakhsh-áb was stated by Ibn Dust to rise in the upper country of the Kharlokh Turks, to pass in succession through the regions of Famir, of Rasht, and of Kumid, till it reached the gorge between Washjird to the west and Tamliyat to the east, where it was crossed by the famous "stone bridge," and ultimately joined the Jyhún at Míleh above Termid. Tamliyat, which was four farsakhs to the east of the stone bridge, was named *Termestat* in the earliest authority, Ibn Khordad-beh, and was thus almost certainly the original of the *Ta-mo-si-t'ie-ti* of the Chinese, though the name, like that of Darwaz, seems to have had a wide application, and in the Buddhist pilgrim's account to have denoted the region south of the Panj between Khotl and Shignán.† The Wakhsh-áb below the "stone bridge," which had

* In the 'Prairies d'Or' (French edit. tom. i. p. 207) we find, "Among the descendants of Amúr were the *Khotto*, who colonised Khotlán and Roshán, and the people of Oarushneh and Sughd, between Samarcand and Bokhara, and the people of Ferghánch and Shash, and Isfjáb and the country of Faráb." There is a complete ethnical confusion in this notice, but it bears witness at any rate to the antiquity of the name of Roshán.

† *Ta-mo-si-t'ie-ti* is supposed by Colonel Yule to represent the valley of Wakhán, and if the Buddhist pilgrim crossed the Pamir by the lower road leading to Tash-Kurghan, this identification would seem to be established; but how then can we explain that the Oxus affluent coming out of the Dragon Lake (or Kara-kul) joined the great river on the eastern frontiers of *Ta-mo-si-t'ie-ti*? See 'Vie et Voyages, &c.', p. 272. If the theory be accepted that Ko-pa-to is Ghand, and that Hwang-Tsang crossed the Pamir by the high road up the valley of that river, then we must suppose that *Ta-mo-si-t'ie-ti* included all cis-Oxus Darwaz, together with part of the modern Shignán; and here it may be observed that there is a clear distinction in the Arab geographers between Shikiniyeh and Shignán. The former is always mentioned (by Istakhri and his followers) with Kurán and Wakhán as the extreme frontier district of Badakhshan towards Tibet and may thus very well answer to the Shi-ki-ni of the Chinese; but the Shignán of Ibn Khordad-beh and Biruni is apparently a different place, Iakhshem being the principal town of the district. Hwang-Tsang may have passed from Kurán, the upper valley of the Kokcha across the mountains, north of Fyzabad, to *Ta-mo-si-t'ie-ti* (perhaps the basin of the newly discovered Kof-au), then along the Shewa Pamir to Bar-panj, and passing the Panj, up the line of the Suchán and Ghand to the head of the valley, where Buddhist remains ought to be looked for. Biruni mentions some other places on the Panj below Shignán, namely the ruby mines, *Sad-ján* and *Jeláwa*. *Sad-ján*

been visited and described by the Russians, passed, firstly, by the ruins of Kurghan Teppeh (representing the Halawerd of the Arabs, which was the capital of Wakhsb, and known probably to the Greeks as Ἀλιχόβρα, and in Puranic geography as Ilavritta), and lower down washed the ruins of Lakman which was the Lavkend or Lamkend of Istakhri and his followers.* He might further note that although the name had disappeared from the most recent Russian map, the old Arab capital of Hulbuk (now corrupted to Albak) was clearly marked by the first Russian explorers one short stage to the south of Kulab; and in the immediate vicinity of this place must be sought the tomb of Syud Ali Hamadáni, which for many centuries was the most famous place of pilgrimage in the Oxus region, though unvisited, he believed, since Sidi Ali's journey some hundred years ago.†

Before concluding, Sir Henry wished to say a word on the political question. Politics as an independent subject were, it was well known, excluded from discussion at the meetings of the Royal Geographical Society, but it frequently happened that they could not be dissociated from geography. On many occasions, indeed, and the present was a case in point, the political element was the most important subject of consideration. If it were not, for instance, that the districts which Mr. Michell had described divided the Russian from the British dependencies, and in the course of a few years probably would form a close and connecting link between the two empires, the Upper Oxus and its tributaries would be comparatively of little interest. Under present circumstances they were, however, of considerable importance, as he would proceed briefly to describe. The Fellows of the Society were probably aware that in 1872-3 an understanding was arrived at between the British and the Russian Governments with regard to the northern frontiers of Afghanistan. The district of Badakhshan, to the north of the great range, had at that time been only recently united to Kabul by Dost Mahomed Khan, and Russia hesitated at first to acknowledge it as an Afghan dependency. Ultimately, however, in 1873, the point was conceded, and Badakhshan and Wakhan were admitted by the two Governments to form a portion of Shir Ali's patrimonial territory. The frontiers of these districts were not discussed—in fact, such frontiers were not at the time at all accurately known; but it was assumed in a general way, that the Oxus was the limitary line between the Afghan districts to the south, and the Bokhara or Kirghiz territory to the north. Later exploration had shown, however, that this was altogether a wrong assumption.

is unknown otherwise in geography, but may represent the stronghold of *Sirojan*, in the hills above Wamar, which is still used as a place of refuge by the rulers of Roshán and Shignán, and *Jeláwa* may possibly be the original of Gulab or Kolab, the forms being nearly similar.

* These cities on the Wakhsb-ab were ruined probably before the time of Timur, since their names do not occur in the accounts of his wars in this region. Kolab seems to be the place named by his historian Ghuleo (tom. i. p. 63), and Baljewan, which is still a considerable place, is first mentioned at this period. It answers apparently to the settlement of the Mong (who are the same as the Nogais) which is placed by Istakhri at two days from Hulbuk, and two days from the "Stone Bridge." Kolab is stated in the Haft Aklim to have a very strong fortified castle, but it is unknown by whom the castle was built.

† Sidi Ali gives the name of Dilli to the village where he found the tomb of the famous saint, a pilgrimage to which was the main object of his journey from Constantinople. The Haft Aklim records that Sidi Ali of Hamadan, who died at Kabul in A.H. 776, during the reign of Oljaitú Khan, was buried in Khutlan in the vicinity of Kulab, though why such a remote and inaccessible spot should have been selected as his place of sepulture is nowhere explained. Sidi Ali's travels, which contain much geographical information, were translated and published in the 'Journal Asiatique,' Ire Ser. tom. ix. p. 204 sqq.

The ancestral rights of the Badakhshanis were found to extend far beyond the river along the whole line from Wood's Lake to Yaz Gholam on the Darwaz frontier, while the claims of the Bokharians to an almost equal extent of territory south of the river stretching from Roshan to Kulab, were also shown to have been admitted from time immemorial. It was raising a false issue to suppose, as generally stated in the press, that the present dispute between the British and Russian Governments merely referred to the dependency of the Trans-Oxus portion of Shignan and Roshan. If these districts, which formed an integral part of Badakhshan, were to be evacuated by the Afghan troops in deference to the supposed obligations of the agreement of 1872-3, then the Government of the Amir would require to be compensated by the restoration of the Cis-Oxus districts, hitherto forming part of the Begship of Darwaz; but in real truth no such complication had arisen and no forcible exchange of territory was required. The international understanding above referred to provided that Badakhshan should be recognised as an Afghan possession, and all that remained for present execution was to define by means of a joint commission what the true geographical limits of that possession were. The Bartang or Murghabi, the Ghand and the Shakh-dereh valleys, peopled by Shignanis, were undoubtedly parts of Badakhshan; but the uplands beyond, forming the outskirts of the Pamir Plateau, might very well be left in the occupation of independent Kirghiz, and the frontiers between Uzbek and Afghan jurisdiction would be thus defined, as Dr. Regel, the Russian traveller, had already suggested, by the watershed between the Wenj and Wamar valleys. There was some disagreement, Sir Henry added, between the results of Dr. Regel's exploration of the line of the Oxus from Darwaz to Wamar, and the surveys recently executed by an employé of General Walker's. According to the last named authority the river flowed in a general direction of west and east, as previously stated by the native explorers of the Indian Topographical Department, but in the recently executed Russian map a great bend to the south was here laid down which completely changed the geographical character of the region. He would leave this point to be argued between General Walker and the Russian authorities. All that he desired to say was that he felt sure English geographers were ready to admit they were under extensive obligations to Russian officers for the great progress that had been recently made in delineating the physical features of the Pamir plateau. The country was not yet triangulated with the precision which had been arrived at by the Indian Survey to the south of the great range; but the Russian astronomical observations had been connected with Major Trotter's work at Lake Victoria, and the general map of the country from the Jaxartes valley to the Kashmir frontier might thus be regarded as completed.

The PRESIDENT said the district referred to had been explored under the orders of General Walker, the late Surveyor-General. That gentleman was not present, but he had entrusted Major Holdich with the statement that he would have been prepared to make.

Major T. H. HOLDICH, R.E., read the statement as follows:

Note on Discrepancies between Russian Surveyors and the Indian Explorer
M—S—.

IN the account of the Russian Pamir Expedition of 1883, of which a translation from the *Isvestia* of the Russian Geographical Society is given in the March number of the 'Proceedings' of the Royal Geographical Society, some considerable discrepancies are pointed out between the surveys of M—S—, a native of India, employed as a geographical explorer in connection with the operations of the Indian Survey Department, and the recent surveys of Russian officers.

The principal discrepancy is in the delineation of the upper sources of the

Murghabi-Bartang river which enters the Panjah near Kila Wámar. M— S— makes this river rise in the Sarez Pamir, contrary to the long accepted belief that it is a continuation of the Aksu river, which rises far to the south in the Oikul lake, circles round the southern Pamirs, and then becomes the Murghabi-Bartang river.

It appears that in September 1880, M— S— was residing near Kila Wámar, and being known as a great physician, was requested by a man of the Bartang Valley to accompany him to Sarez and attend a person who was seriously ill. He proceeded up the valley to Sonab Tashkurgan, where the Murghabi receives a stream coming from the north through a valley called the Pasár Dara, which is probably identical with the Russian Kudara; from this point he proceeded along the Murghabi river to Sarez, which he calls the last inhabited place in Bartang. He believed that the sources of the river lay in the hills hard by at the head of the valley, and that he had reached the vicinity of the water-parting, as implied by the words Sar-rez. His map was compiled under the superintendence of Colonel Tanner, by whom, as well as by myself, he was closely questioned regarding the Aksu river; he declared most positively that he had not come across that river, but believed it lay to the south of his route; his field-book, which had been kept in great detail, was carefully scrutinised to ascertain whether it indicated the junction of any stream from the south which he might have forgotten, but it did not do so. His survey placed the Murghabi considerably to the north of the position assigned it on previous maps, and thus left ample space for the Aksu to find its way to the Panja without entering the Murghabi river. At the time, he was the only explorer who was known to have traversed the Bartang-Murghabi valley and reached Sarez; his rendering was therefore accepted for the next edition of the Turkistan map, though not without some misgivings.

Last year a Russian officer, Captain Putiati, accompanied by the topographer Bendersky, followed the course of the Aksu down to Sarez, and found that the river merges into the Murghabi, thus showing that M— S— must have been mistaken.

I would therefore take the present opportunity to state that in scarcely a single instance has it been found possible to employ a trained native surveyor in making explorations beyond the British frontier. The natives in the service of the Indian Survey Department could not venture into these distant regions without great risk of detection, which would probably result in their murder, or at least grievous ill-treatment. All the most successful explorers have been men specially selected for the purpose, who resided on the frontiers, and had the right of travelling into the regions beyond as traders, physicians, pilgrims, or religious teachers. M— S— was a Pir of notable sanctity, who resided in Kashmir; he had visited the regions of the Upper Oxus in previous years, and was about to revisit them, when he heard that he might be accepted as an employé of the Survey Department. He offered his services to me, and I accepted them; he was trained for some weeks in the Survey Office at Dehra Dun, and after he had been taught as much about surveying as he could take in, he started off on a tour of pilgrimage and discipular visitations combined with geographical reconnaissance. He acquired much useful information, very little of which has as yet been permitted to be published; but of course his geography has always to be accepted with some reservation, and is of very little weight as compared with the work of a trained surveyor, whether Russian or of any other nationality. I have, therefore, no hesitation in concluding that the Russian topographers are right and he is wrong as regards the merging of the Aksu into the Murghabi.

But as regards another discrepancy between his map and the recent Russian map of the Pamir, I side with him and believe his work to be the more reliable. Dr. Regel gives a vast bend to the Panja river in its course immediately below Kila

Wámar; M— S— here makes the course almost direct, and it so happens that his work is corroborated by the Havildar's explorations made several years previously. The *Javestia* remarks that Dr. Regel's maps must be accepted with great caution since he is no surveyor. Here, then, I think that the survey of the Indian Pir is to be accepted in preference to that of the Russian physician.

There is one more discrepancy which is of much importance. Dr. Regel represents the Shiva lake as having an area of fully 100 square miles, and thus exceeding in magnitude all the Pamir lakes, with the exception of the Great Karakul. M— S— shows a Shiva lake of very small size—2000 paces long by 250 broad are the dimensions given in his field-book. But Dr. Regel had heard of a great lake, and he made a journey with the express object of visiting it; and though he may have unintentionally exaggerated its magnitude, he must surely have come across a great lake. In Wood's 'Oxus' the Shiva lake is mentioned as of considerable magnitude. On the other hand, M— S— was travelling by the most direct route across Badakhshan, from the Ragh Valley over the Khoja Parwa Pass to Kila Bar Panja, without any thought of exploring the Shiva Pamir and visiting the entire lake region; he came across a little lake which appears to lie considerably to the south-east of the great lake discovered by Dr. Regel; and as there appears to be ample room for both lakes, it is but reasonable to suppose that both Dr. Regel and M— S— are in this instance correct in their respective renderings.

Sir LEPEL H. GRIFFIN said he had been connected with the districts described in the paper in a diplomatic way. The late war in Afghanistan had to a great extent changed the position of England with reference to the Amir of that country, and the determination of the northern boundary of Afghanistan was a matter of pressing importance. When he first met the Amir in the autumn of 1880, on the part of the British Government, and delivered to him a memorandum which was practically a treaty of obligation on both sides, the point to which the Amir attached most importance, and about which he expressed the greatest doubt, was the definition of the northern boundary, so as to prevent any future cause of dispute between him and his great neighbour to the north. The difficulty which the Amir then foresaw had now arisen both on the Herat border and on the border which Mr. Michell had described in his paper. The districts in dispute between the Amir of Afghanistan and Bokhara were districts which the Amir certainly considered to be included in Afghanistan—Shignan, Roshan, and Wakhan. He (Sir Lepel Griffin) agreed with what Sir Henry Rawlinson had said with reference to the question of the boundary of Badakhshan. It was a small matter whether one branch of the Oxus or the other were taken as the northern boundary; the real point was that the Russian Government had agreed to Badakhshan and Wakhan being included in Afghanistan, and this inclusion was not affected by their geographical position with reference to the Oxus. He had no doubt that considering the importance of these districts the English Government would take a similar view. Those wild and isolated regions, with a very sparse population and yielding no revenue, might appear to many Englishmen to be of little political importance, but from a strategical point of view they were of great importance, seeing that they commanded some of the easiest passes leading into India. He hoped that the British Government would uphold his friend, the Amir of Afghanistan, in the possession of all territory which could be proved to have belonged to Afghanistan.

The PRESIDENT, in proposing a vote of thanks to Mr. Michell for his interesting paper, said it was always a matter of surprise to him when a man was able so completely to realise the descriptions of geographers as to write such a paper. Still they had heard Sir Henry Rawlinson talk of these regions as if he had been familiar with them from his youthful days. Colonel Yule also had described coun-

tries which he had never seen, and received the gold medal for travels that he had never made in the body. The discussion had been chiefly interesting as throwing light upon a district of great importance. For the reasons mentioned by Sir Henry Rawlinson and Sir Lepel Griffin, it was desirable to the last degree that Englishmen should exactly understand the merits of the case. Lord Clarendon, followed by Lord Granville, took infinite pains to come to an understanding with Russia in order that a large district in the nature of a buffer might be interposed between England and Russia. At that time Badakhshan was accepted as a portion of Afghanistan, and the only question now was how much of the territory belonged to Badakhshan and how much to Karateghin and Bokhara. Although these countries have been tributaries to Bokhara they were now in a happy state of independence. No doubt the actual ruler of Bokhara would still claim some influence over them, but all lovers of peace would, undoubtedly, wish the barriers between England and Russia as strong as possible, especially when they learnt that the people occupying the region which had been described enjoyed so much prosperity since they had escaped from the rule of Bokhara. He was sure that every one present would in future read their newspapers with greater interest from having enjoyed the benefit of hearing the opinions of such great living authorities as Sir Henry Rawlinson and Sir Lepel Griffin.

Additional Note on Darwaz. By Major-Gen. Sir H. C. RAWLINSON,
K.C.B., &c.

THE exact positioning of Rasht, which being regarded as the extreme limit of early Mahomedan empire, and the barrier post against the invasion of the nomades, was a place of much importance, has always been a subject of great interest to geographers. With regard to the general geography of the district there can be no difficulty, as Istakhri and Ibn Haukal, in defining the eastern frontier of Mawer-en-nahar, name in succession the liminary regions of Famir (Pamir), Rasht, and Khotl (or Kulab), while they place along the southern borders of the province of Osrushneh, Kesh, Saghanian,* Shuman, Washjird, and Rasht, thus clearly identifying the district of Rasht with southern Karateghin; but what we really want to know is where the strong fort was situated, which is said to have been built by the famous Fadhl the Barmecide, in about A.D. 796, to curb the invasion of the Barbarians, and which was called indifferently El Kil'eh, "the fort," and El Báb, "the gate." We may dismiss as fable the idea of a fort actually blocking the way between two hills and thus barring the passage of the tribes. The same story was told of the famous "Iron Gates" of Kahlugah, and of the still more celebrated Bab-el-Abwab, or "Gate of Gates" in the pass of Dariel, or Vladicavcás. All that was probably meant was a strong position dominating the surrounding country, and thus guarding the entrance along the north to the rich valleys along the middle Oxus and its tributaries. Now the early Arab travellers who stereotyped the geography of these regions, have left on record an itinerary of the road from Termid on the Oxus, to the extreme point of El Kil'eh or Rasht, which ought to enable us to fix the position with tolerable certainty.† There were some twelve stages from one point to the

* The Arabs having no palatal in their alphabet wrote Saghanian for the Chaghanian of the Persians. In Timour's History (tom. i. p. 183) the town is named Jagana (for Chaghana) and the river Jagan-rud. Its distinction from Hissar is well marked. See *Hist. de Timour*, tom. i. p. 35.

† There are discrepancies between the itineraries as preserved by Ibn Khurdad-beh, Istakhri, Ibn Haukal, and Edrisi, but they are of no great extent, and ought not to

other, the large stations of Chaghanian and Washjird occurring at nearly equidistant intervals, and thus dividing the line into three sections, of about 100 miles each. Our maps of this region, derived from Russian sources, are not yet sufficiently accurate to enable us to verify these distances in detail, but we can hardly err in placing Chaghanian, the name of which seems to be now lost, on the Kafir-nihan river, perhaps at the ruins marked in the latest map as Tash Kileh. Shuman, which intervened between Chaghanian and Washjird, was probably at Hissar, the name having been varied to Shadmán to suit a pretended etymology, and Washjird itself must have been on the Ilek river, hardly as far east as Fyzabad, which seems to be not more than 10 miles from the famous stone bridge over the Wakhsah-áb,

vitiating our measurements on the map. Practically, however, we find the distance between Termid at the mouth of the Surkhan, and Chaghanian on the Kafir-nihan, to be on the map nearly the same as that between Chaghanian and Garm,—that is, the first section of the itinerary measures on the map as much as the second and third sections united, which seems to show that there must be some important error either in the map or the itinerary, or in the identification of the intermediate sites. The name of Chaghanian, which was four or five stages from Termid, is now entirely lost, but it cannot have been further south on the line of the Kafir-nihan river than the ruins of Tash-kileh since it was passed by Sidi Ali on his route from the Stone Bridge, one stage to the east of Deh-náú. All the authorities are agreed that Chaghanian represents the Chi-go-yen-na of Hwang-Tsang, but in the further explanation of the Buddhist list there is great uncertainty. Yule suggests that Ho-lu-mo is Garm, but this is quite impossible. Holumo is evidently the *Ahrus* of history which, for the two first centuries of Islam, was always associated with Shumán, but the name of which was lost before the time of Istakhri. It was probably near the place marked as Katanvan on the map. Shumán itself was almost certainly Hissar, which name first appears in history in the wars of Timur, the epithet of *Shadmán* (or “the happy”), which then applied to it, being a corruption of the old name. The next Buddhist name is Kio-ho-yen-na = Kuvayan. This is immediately to the east of Shumán, the list evidently following the high road from Termid to Khotl, and it can hardly therefore represent Kobadian, 100 miles to the south, as proposed by Colonel Yule. I should prefer *Kufiyán*, the king of which state, according to Beladheri, came and did homage to Koteibeh on the first Mahomedan invasion, together with the kings of *Ahrun* and *Shumán*. The position was probably about *Washjird* or Fyzabad, but the name is unknown in geography. The next two names, Hu-sha and Kho-tu-lo, represent, of course, Wakhsah and Khotl; and the more celebrated name of Houou on the Oxus to the south, where Hwang-Tsang, on his return from India, visited the great Khan's son in his hunting encampment, is to be traced probably in the *Uvej* or *Ubej* of geography, now corrupted to *Aivej* and applied to the Kobadian ferry, the final *j* in this name being a mere dialectic termination. A few words may be added in explanation of Ibn Dust's geography of this region. In the first place, he appears to confound the upper waters of the Surkhan and Kafir-nihan rivers, uniting all the streams which flow from the mountains south of the Zar-afshan valley, called Botm, Sinam (or Siyam), where Mokanna, the veiled prophet, had his fort, Niham, and Khawer, into one bed, under

the name of *Rámíd* (رامید for رامل of the MS.). This corrected form of Ramid may be compared with the name of Rumid still applying to the upper valley of the Kafir-nihan (Meyendorf applies the exact name of Ramid to the high mountain above Garm). Ibn Dust then names the several arms of the Ramid, as the Kam-rud (the Hissar defile mentioned by Baber), the Niham-rud (present Kafir-nihan), and the Khawer-rud, which must apparently be the Ilek, though the name does not elsewhere occur in the notices of the geographers.

but in the immediate vicinity.* The last section of the route from Termid between Washjird and Rasht, undoubtedly followed the line of the Ilek river up to the watershed between this stream and the Ab-i-Garm, thus traversing the whole extent of the steppe called Dasht-i-Bidan by M. Oshanin, and here accordingly, or in some of the lateral valleys to the east, must be sought the site of Fadhl's famous fortress.† The hills, it must be observed, which divide the high plateau of the Dasht-i-Bidan from the Wakhsh-áb are still called Mount Darwaz, though with no immediate reference to the district of Darwaz, east of the great river; and the name of the Ilek, which is one of the head-streams of the Kafir-nihan, is preserved not only by Istakhri, who connects it with Washjird, but also by Baber (page 127), who mentions his having followed the Ilek in one of his marches through the hills from Ferghanah to Hissar. Apparently in all time the best route from the north-east followed down the Wakhsh-áb as far as the mouth of the Ab-i-Garm, and then crossed to the Kafir-nihan valley by the steppe called the Dasht-i-Bidan, the highest point of which gave rise to the Ilek flowing south, and to the Ab-i-Garm flowing north. Oshanin was five days travelling from Fyzabad by this route to Garm, the capital of Karateghin, which nearly agrees with Istakhri's stages between Washjird and Rasht, but I still hesitate to fix the exact site of Fadhl's fort pending a more careful examination of the country.

Seven Years' Travels in the Region East of Lake Nyassa.

By Rev. W. P. JOHNSON.

(Read at the Evening Meeting, June 23rd, 1884.)

Map, p. 550.

THE country of which I have to speak seems naturally to divide itself into three parts: the country north of the Rovuma; that between the Rovuma, the Lujenda, and Nyassa; and, lastly, the country south-east of Nyassa, down to Quilimane.

It is impossible to reach the people without mastering the main features of the land, and commonly the features of the land are often

* Washjird was one stage or about 20 miles from the "Stone Bridge," and may therefore have been at the town of Kafir-nihan, the next stage to the east according to Istakhri being at Ilek, perhaps the modern Fyzabad. In Sidi Ali's time the next stage to the west after the "Stone Bridge" was Bazarand, and from here the road to Chaghanian was probably deflected to the south, leaving Hissar at some distance to the right.

† The following passage occurs in Mr. Delmar Morgan's paper recently published in the Supplementary Papers of the R.G.S., 1884, p. 229. "The watershed between the two rivers (Ilek and Ab-i-Garm) is imperceptible, the valley of Dasht-i-Bidan, where they rise, being a high steppe, such as are common in the highlands of Central Asia. . . . Ascending one of the head-streams of the Ilek (from Fyzabad) M. Oshanin found that after proceeding along the bank some distance the track left the water's edge, approaching it again after a while. No perceptible difference having been noticed in the level, he thought he was following the same river, and was surprised on observing later the water flowing in an opposite direction, proving that he had crossed the watershed between the basins of the Kafir-nihan and Surkhab, here undivided by the smallest eminence." Across this steppe then was the track pursued by the Kharlook and Taghazghaz nomades whom Fadhl sought to arrest, and somewhere within its limit must his famous fort of "the Gate" have been erected.

dramatically set forth in a correct view of the position of the people. Thus, the first step towards seeing the country is to know the routes, and these bring a fourth element on the scene beside the above three parts, viz. the people who come from the east.

I. The central part may be divided into the eastern coast-line of Lake Nyassa, its wall of hills, its central slopes, and the valleys of the Lujenda and Rovuma.

Its coast-line is cut by small streams flowing into the lake, often not more than 10 miles in length, except one, the Lunyo, and that is probably not very much longer. I first reached the coast at the village of a chief named Makanjila; this man's predecessor, a Masanyinga Yao, came across from the Lujenda, and drove the Wa-nyanja before him. Livingstone describes either this or a similar movement of the Masanyinga Yao when he first crossed the great hills east of Makanjila's, and came down to the lake near Losewa.

I reached Makanjila's by way of the hill Mtonia from Mataka's town at Mwembe; a little lime had been found near his then village, with which he had decorated a mosque, and an open verandah was used for a school. In front of the verandah two coco-nut trees were growing, the only ones of any size I have seen at Nyassa.

There I first made the acquaintance of his Mahommedan teacher, who has gathered round him all the upper class in the place; he is a fine, tall man, with probably some Arab blood, and quotes and reads the Koran fluently. Makanjila is said by all at Nyassa to have a very long hand, and he gave me the idea of much power and energy. The lower class in the town are Wa-nyanja. The chief sent on a coast man to guide me; with this guide and the one Yao boy I had with me, we went through a number of coast villages, generally with a Nyassa headman, though under the Yao; the guide was charged to purvey food, and the dried fish was very acceptable; in some places there was a little beach, and reed-beds outside, but often a dense bed of prickly reeds shut off a view of the lake, and long passages were found or cut through these to launch a canoe; in these hippopotami abounded, and no canoe ventured to pass late at night.

The plantations inland were many of them in the hands of half-coast men, who have a great regard for Makanjila. After three days we reached the ford from Ngombe to Pasekole.

At that time there were a number of these Nyassa villages in the reeds easily accessible from the lake; and sometimes, when my guide had got a canoe, we stopped in front of a long narrow entrance to a village through the reeds, that the people might stare at the white man. My guide left me when safely in the canoe with my boy, and two silver dollars were the only thing I had to give him or his chief. At Sekole's I found men who hailed from Masasi, come across on mysterious trading; here again I borrowed a canoe and coasted very slowly round Nhosi

(a hill) Malabwi into what I think is called Monkey Bay. I then experienced the kind hospitality of Dr. Laws and his coadjutors for the first, but not the last, time.

Long afterwards I came down from the hills east of Ngombe, and found Namkumba and a number of Yao at the foot of the hills, who told me that canoes were still crossing from Ngombe to Sekole continually. While I was there, a party returned who had been over the lake; distant guns announced their coming, and the usual wild dance of greeting followed, to welcome the son of the chief. To have made a long expedition successfully is the thing to do.

Villages are scattered on the hills. I passed one on the way from the south end of Nyassa to Mwembe, some seven miles from the river Shiré. On the hills east of the Shiré, lives a powerful chief, Mkata. Going north from Makanjila's we pass the Loangwa, and by grand hills lives a Yao, Mkalawili, who, as well as Makanjila, has a dhow or two. From there Nyassa villages dot the lake shore, protected by fences of euphorbia and marshes. Losewa, where Roscher is supposed to have been killed, is one of these, a wretched harbourage, where some eight dhows ply across. These dhows can be fastened to a bed of reeds alongside the bank. Some 10 miles north, at Chingomanje's (a Yao), there is good anchorage, and a smaller inner creek, in which lay a dhow as we passed. A few miles further north a small headland runs out south-west from the bold promontory of Mtenguli, and forms a capital harbour. Considerable villages of independent Nyassa extend from near Mtenguli up to Chiteji's and the other side of Chiteji's Bay; at one part the rocky hills, everywhere trying to the feet, as they abound in loose quartz pebbles, come down into the lake, and are rarely traversed near the lake shore.

Though the lake is widest at Chiteji's, yet, owing to the proximity of two islands, Lukoma and Chisamulu, both in dependence on the villages of the Chiteji group, there is a regular crossing there; and it impresses one much to see three or four canoes as it were in mid-ocean, whence the hills are on either side barely visible. A long day-and-night paddle may land the adventurers, if there is no storm; I have only heard of one being lost, yet the passage is very frequent. Such exertion seems the natural outcome of the long nights and days of fishing, and the shorter runs to Chisamulu and back. Boys look forward to be given the bow paddle, and their only reward is to see the other side of the lake. I have heard a boy taunt another, "You paddled across, and then were so afraid that you sat in the canoe while the others went up into the villages." These canoe-men, like those at the Pasekole ferry and those on the dhows at Losewa, are a class nourished by their position.

The prevailing violent south wind hinders the native efforts to carry about salt and food in the native dhows, yet sometimes a vessel ventures to bring salt from the south to Chiteji's; it is obtained near the

south end of the lake in considerable quantities by filtering the earth. Canoe life takes us north too, to Mbampa, the best harbour on the lake, where some people, akin to the Nindi tribe, live. Day and night work, and often a ducking such as ruined my dried plants, do not daunt the canoe-men from passing along much rock-bound coast, and buying the nasty salt made from tree-ash, or manioc, or hoes, in exchange for fowls, or a goat, or what not.

Mbampa is nearly land-locked, a beautiful deep basin, where the people live all about upon the rocks, on which a hut can hardly be made to perch. Here the rocks come down to the shore, and a little to the north are a number of inhabited islands, and some villages built on piles in the water. Here a brisk traffic goes on. Amakita, the chief of a considerable village a day's journey up in the hills, and his dependent villages—one I remember as a mass of bananas round a beautiful stream, Nyassa just visible down the steep gorge—brings Indian corn to exchange for an equal sackful of dried fish. This fish, like a small sprat, is eagerly sought for, and is dried whole by the natives. Many of these hill-people have adopted the Angone shield.

This part of the sea-board is important ground for coast caravans, who must establish a connection with some chief on the east before they can cross the lake. Thus these caravans keep up much life between these villages and the outside world, and often enable villagers to travel by land to the coast, or wherever they wish to pass. Their spirit of adventure often urges them to go alone or in small parties to some other town, as from a village on Nyassa to Mwembe, &c., but too often some of the little party are killed by marauders, by wild beasts, or hunger.

We may now go a step eastwards. At all points in going east from Lake Nyassa we have to ascend very soon, and from far north to the hills beyond Mkata, south, stands a great barrier of hills of considerable variety. To these all the lake people look, whether for the guns that announce a caravan, or for the sweeping raids of an enemy. To begin south. North of the huge pile of Zomba, and other smaller hills in its neighbourhood, there is a break in the elevated land where Pamelomba may, at some former time, have overflowed into Lake Kilwa, but north of this come a group of hills conspicuous for their sharp peaks which, low on the south, rise northwards to the lofty height of Mount Mangoche, now the shelter for the Amachinga Yao. From the middle of these hills rises the Nyinyesi, tributary of the Lujenda, and from its north side the Mandimba. West of the Mandimba the hills that limit the Nyassa basin are not very high, well covered with verdure, and rounded. On the south-west of Mangoche lives Mkata, not on good terms with his relatives. The Yao near Zomba said that they ordinarily went round by the Shiré and Mponda's to get to the east side of Nyassa and Makanjila's rather than pass Mkata's village. When I passed in 1880, he was living well up in the hills. The base of Mangoche is 2000 feet above

sea-level; the peak would be nearly 5000 feet high, while the hills crossed north of it near the south end of Nyassa would be 3000 feet. There were a few villages dependent on Mkata, and marshy land below, near the south of the Mandimba, as there is near the source of so many African rivers—sponges that overflow in the rains, and always send out a stream.

Above Namkumba's, where we crossed the hills by a path from Ngombe's to the lake, and caught sight of a small island, the height is about 4000 feet. These hills are wooded on the sides, and to the north rises a mass of peaks, the outposts of the high land which takes in Mount Mtonia, and stretches up to the river Msinje. These peaks must be over 5000 feet high. Mtonia village is at an altitude of 3500, at the foot of what looks in the distance like a vast wall, some 10 miles long. North of Mount Mtonia come rolling uplands, as we near the source of the Msinje, covered with forests of *masuku*, but otherwise sparsely wooded and with no wood in the upper part; these hills fall away into a well-watered low land near Makanjila's present village at Cape Ngombo, but north of that place come down steeply into the lake. There is a great deal of mica and quartz in these hills, but north of the Msinje river commences a different country, rich in flowers, where my men found lime to chew, and I subsequently sent men who burned and brought back lime. The hills there, as further on, were rich in bracken and flowers, but not in trees; a cave afforded refuge to those who fled from war. The Msinje starts on its course between steep hills, and when we tried to cross it, just after the rains had commenced, we lost a donkey, and very nearly its driver. The stream was some 10 yards across, and only spanned by a tree, under which it rushed some 10 feet below, and the boy did not hesitate to jump down into the stream with the unwilling donkey.

This limestone country is only separated by one long day's journey from the harbour of Mtenguli.

Chisindo stands out conspicuously in the Msinje valley, an outpost of the northern hills; from it starts the Lunyo, a stream that is one of the hundred rills that feed Nyassa on the east, and, like the others, brings down sand, so that before the rains are well over its mouth is silted up, as the lake itself rises a little after the rains just as the river is falling, and so the sand is rapidly deposited at the mouth of the river. North of the Lunyo the low hills near the coast are in some places cultivated, but north again the hills near the lake, as they rise and form the great headland south of Chiteji's, are one mass of loose quartz, &c., and we found no regular path over the headland, and camped in a tiny bay on the shore at a point where the passing canoes always imagine they have seen marauders encamping.

The hills fall away to some few miles from the Kobwe, and I first crossed them to visit the marauding Gwangwara. A good supply of very

moderate sized timber here grows in the valleys, beautiful rills run everywhere, but often no track can be followed over the loose stones, and so we wandered up and down in those hills, as the usual path to Unyango went too far south, when we struck the war-path of the Gwangwara. We soon came out on the east side of the hills and could see Chisindo south of us, and from thence northwards at intervals we could see the hills east beyond the Msinje valley. Here and there a very narrow steep piece of path reminded us of what the captives must go through as they are driven handcuffed up this path. We often passed ravines through which streams issued from marshes shut in between the low ridge we followed and the higher hills nearer Nyassa. Some 50 miles further these hills became higher and bare at the top, but all the lower ridges are well wooded.

Day after day we slept in deserted Zulu encampments, getting accustomed to the apprehension that their owners might find us trespassing at night. However, we met no one till we reached the Rovuma. We noticed at one marshy place that some man had passed alone with a child, probably a refugee; but if they were passing that way they hid from us. On Sunday we got a fine view over towards the Rovuma, apparently a boundless well-clothed plain, with two or three little hills north-east, and Msenga south-east in the distance. Above the Rovuma we were met by a Yao, who had come up to ransom his wives, and he told us that we should find some villages of the dependents of the Gwangwara beyond the river, but they themselves were three days further on.

On leaving the Gwangwara I had to return with three Nyassa over the hills above Mbampa. We followed a well-used path up steeply into the hills, then along a fine valley, over a big brook, and then through large fields of peas, and through valleys where horns were blown to summon the workers to Amakita's town.

The people here hoe with long-handled hoes with blades like a small spade, and raise capital mounds, while irrigation is used to a considerable extent. Yet at the village the people were only able to live up the hill, and always afraid of the Gwangwara; the houses were very low and round, while the verandah was fenced in and its door not corresponding to the inner door, which one could only reach by drawing the body along the tiny verandah on all fours to the inner door. Of course inside was pitch dark save for a smoky fire. This arrangement of doors may be partly for warmth, partly for wild beasts. When we reached the village we slaughtered what remained of a very thin heifer, and as the sun went down there was a fearful yell, as some wild animal had carried off part of our meat and a child. When these things happen often among a poorly-armed people, who are always fearing human enemies as well, the idea that the beast is not an ordinary hyena or leopard, but something uncanny, seems quite

natural. I only just had strength to pull myself inside the hut. Coastmen had penetrated to this village, and one of them stood on a hill the next day as I was being ignominiously carried to the coast, cursing me and all Europeans, who, he said, had meddled with his slaves. The scene was striking as we descended from the hills—how very sweet the sound of the waves on the beach seemed! But there was no rest, as a great dance was going on, and we met the whole population painted a bright red; and at night, just outside my door, drum and rattles and pipes kept the merriment going till the sunlight came over the hills down into the tiny huts perched about amidst the rocks.

There were numbers of villages about here, some on islands, and coming down the lake I afterwards spent two days on one of these islands, where I was much struck by the performance of a herd of cows, who swam to the mainland in the morning and back in the evening, carefully avoiding sunken rocks.

It is very strange, reaching one of these rock-embedded villages at night; torches cast a strange light on the rocks and wild forms, the tossing canoes and the cliffs overhead; and how pleasant is the proffered hospitality—the cleanest mat on the state bedstead of crossed bamboos in a well-built hut! A long canoe or land journey makes you forget the rats; nor do I remember mosquitoes there. All this headland north of Mbampa is inhabited, and islands abound; the people with Amakita seem to be a united body—at least in language.

Going further east, to what ought to be the best of the land, I recall the figure of an old man, a Mchinga Yao, who, with a youth and a Yao Christian from Masasi, accompanied us through the country west of the Upper Lujenda. He was an old man, very loquacious, and of little dignity; but as he accompanied us up the masses of rock between the Luambali and the Luchimwa to point out to us every day the features of the country, whence we could see the Mwembe hills, part of the rich valley of the Loangwa, and the hills beyond the Lujenda, his face would light up as he described the good old days when he was a boy, when each of the many streams we had crossed, and were to cross, was the site of a village, when strangers could pass from one end of the country to another, and Indian corn, rice, and goats abounded; he dwelt on the social life, the free hospitality, the ready transit, the giving food and receiving news in turn that then prevailed; before the Alolo had come upon them from beyond the Lujenda, and driven some north, some south—a people very fierce and barbarous, whose language he tried to imitate.

When I passed at that time, the Mandimba was thickly settled under their chief Nyambi, a vegetarian. The other man then with me had been carried by his mother from the same country from the river Mtapili, and he seemed to be proud of its depth of verdure and pleasant pools, when we reached it on our way to Mwembe from Masasi; and he might be, as he was then conducting me with five of his own men. Probably,

this same raid drove the Yao south, whom Dr. Livingstone and Bishop Mackenzie encountered; no wonder, then, they found it difficult to all at once realise the intention of the strangers they met, as they fled from the Alolo. As I crossed the Mandimba and wound up and down over the Ligama, the Luchimwa, the Luambali, the Ngwena, the Luchulinga and their hundred tributary streams, or in another journey followed the lower plateau further east from Nyambi's to Mwembe, the whole country seemed to invite inhabitants; one route might be 1600 feet above the sea, the other from 2500 to 3500 feet. The Mwembe plateau is very rich in its wide grassy glades studded with bright orange flowers; the forest is of very small trees, too low for the *masuka*. But the successive raids have not been able to drive the inhabitants entirely from the country. For as the marshes of the lake afford shelter, so do the hills; thus Nyambi's people have been driven to the hills near Mangoche, the Mtonia mass is occupied—villages cluster round Lisali, and the hills east of Mataka's town. There are still villages on Namwero's hill near old Mwembe. The whole country is fertile, and water is found on all the hills. I have a favourable recollection of the Mlimas' hospitality, and of the grey-haired chief at Mtonia. But Unyango is perhaps the most striking of these hill-towns.

After eight days' uninhabited track over and through the numerous tributaries of the Luchulinga, with the beautiful heights of Manza on the right, and the Kambango range on the left, Janson and I were pressing on to find the town Unyango, of which we had heard as the great rendezvous. We passed through a half-deserted country, and saw the two peaks of Unyango rising sheer out of a flat plain before us, but no house could be seen: the hill seemed covered with big stones, and it was not till we were near enough to hear the hum of a populous village that we perceived that the big stones were houses, and that people were moving about on the hill like ants, no one venturing to live below. All that side of the hill was full, and when, last year, I came to the other side, that was full also; and I saw more then, as I went up to see the chief. There must be at least 9000 huts on this hill. The chief seemed a man of a great deal of character, but, as with all these men, we have not yet any independent society to offer him: if he wishes to advance he can go in for coast ways, and yet maintain his independence. He told me that two large caravans were at that time away from his hill on the way to the coast.

We found the same thing at Chiwagula, where, as at Unyango, the Amakali Yao live. Here every pinnacle was occupied by the Yao children curious to see the Europeans. Many of these children have lived on these rocks till they are quite accustomed to them, and at Mwembe I felt that to follow truant boys was like hunting wild goats; and often in the delight of climbing and their independence, the children would laugh at the enticement of a meal, though they had had nothing.

Far worse than the Alolo have been the Gwangwara, who have carried their merciless forays through the land. Just before I passed through the country they had swept round Unyango hill. Mtonia had seen them in the distance. They had left many dead of small-pox at Mkata's; but as we look at the Msinje valley we find them settling refugees from Unyango, Chiwagula, and other places as dependents of their own. From these settlements on the Msinje we sometimes at the lake hear grand accounts of Indian corn, &c.; but it is often the old story of the fox who lost his tail. The people who submit to the Gwangwara are not to be envied.

I do not remember very much of the journey from Mwembe across country to the river Kanyenda; it took us fifteen days, but I had nothing to write with, and so kept no journal. We ought to have done it in seven days, but the popular voice was for very slow marches. We crossed the Luatisi, marked by water trickling over flat rock; afterwards the Matipili, and left Mkula not very far on the right. The scenes every day are impressed on my mind, as I had to depend entirely on those with me, having no stores of any kind. The party would be about 300, some carrying ivory, some tobacco, and a few slaves. The Yao do not travel by canoe, but they love journeys, and barter not for the profit, but as a means of communion with other men, and those caravans are just what they want; in this life was Chuma born, the faithful servant of so many English expeditions. To accompany English travellers, slave caravans, or ivory traders equally meets their wants; if they do not find other opportunities, they make caravans of their own, that can hardly get bare subsistence.

The beds of the Rovuma and Lujenda afford refuge in war time in their labyrinth of islands, and unless we realised this we might pass along stretches of the river and imagine them deserted by everything but the storks and kingfishers and hippopotami. I have followed the Lujenda down from its head to some two days from its junction with the Rovuma. The highest town in it was Amaramba, which I had better describe when I come to Lake Kilwa. The next noticeable feature is Jombone hill, which marks the beautiful confluence of the Luambali and the Lujenda; it is a favourite resort of fishermen from Mwembe. A word as to these fishermen. A man is delighted to go off for four days if he gets some 30 or 40 small fish, which are dried over a fire; for these, if he is lucky, he may get a shilling's worth of cloth. He goes 30 miles to the fishing-place and 30 back, but there is all the pleasure of hawking these dried fish about, which they do merrily enough. Unfortunately, the famine time at Mwembe was not the fish season—at least none were brought then. Similarly, men and boys go off to the south end of the lake to get salt. I came back part of the way with a party of eight or nine and camped with them; they had been seven days going to Nyassa, and perhaps five returning, and had nothing with

them but the salt. I watched them narrowly, and the two days they were with us they only smoked bhang, and licked the dropping of the salt-bags, with which they seasoned some toadstools; but these men would have all the joy of a journey and carrying the salt about at Mwembe. They would have to pay toll to the chief probably. Similarly, by the way, hunting is an excuse for sociability. They are poor huntsmen, but the happiness of a man who can return and summon a village to a feed, or give his chief a tusk! So a party is often organised to hunt, who go agog into camp life but often shoot next to nothing.

To return to the Lujenda. After the Loangwa has entered it we come to villages dependent on Mtarika, especially Tola, and here is a maze of islands; at one of them, Matola, the temperance chief near Masasi was spoken of with great respect. Mtarika has settled on the islands in the river and his town is the first place where I saw each head of a household collecting his belongings inside a big fence. This chief occupies an important position, as here the principal road goes off to Ibo. When I first passed his town a band of men were encamped who had lately come from Mwarija's, and another who had come down the Lujenda from some point of Nyassa; the latter would not allow me to enter the encampment. One route from Makanjila's crosses the hills south of Luambali and follows that stream to very near the Lujenda, some branch off, cross the Luambali, and so by Mwembe, and thence to Mtarika's. Near Mtarika is another civil Yao chief, Mpelembe, who ventures in the wet season to come out of his beautiful island, and cultivate the banks of the river. Crossing the Luatisi and a few other small streams, we found villages—the people, however, in the utmost terror of the Gwangwara—and so we crossed by the Mtapili and found a number of Masanyinga villages under Kandulu; and all up the west bank we met small caravans, some with Mahomedan teachers, others purely native. Kandulu and Mangoché were declared afraid of the evil eye, but gave orders that I was to be treated civilly. I returned up the right bank, crossing at Tola's and so to Nakawali, Mataka's outlying village, 15 miles perhaps. It was only at crossing this time that I had proof that Mataka had confiscated all my property as a reprisal for an attack on one of his caravans. I only mention it here because, hearing of this, a man in charge of a caravan going right up the Lujenda and so to Nyassa, insisted on my receiving a present of food, and would not hear of my giving him anything in return. I had never seen him before, and should not know him again: it was simply helping the oppressed. In the next month I found similar help in a slave caravan, and in the cottages along the Rovuma, until I was able to return to the usual European show of wealth.

Life on the Rovuma is much the same as life on the Lujenda. Two of my companions disputed energetically as to whether the Lujenda or the Rovuma reached the sea; they had each followed his own stream to the

sea, not realising that they join long before reaching it, and the two streams are much the same size.

I first saw the Rovuma in the distance from the location of Matola, the Yao chief near Newala, some 30 miles from Masasi. Later on I reached it at Makochiro, a Matumbwi chief's; it was then winding in and out between densely wooded islands, and the group of the Majeje hills were north of us in fantastic peaks just visible from the higher hills at Masasi. Most of the people of Majeje have moved down to be safer in the river, and here two canoes are used, but the rocks would prevent any very extensive journey being made in canoes. Both the Rovuma from this point to the source, and the Lujenda, would be useless for any big boat; a canoe might get *down* stream in the rains. Every now and then we came to beautiful reaches on each. Westward of Makochiro is a Yao, Chitwanga; here caravans are continually passing and the country is eaten up. I was begging of this man, when I was delighted by Janson's arrival with porters and stores, and here we settled to press on to Nyassa. From a point near here only small granite hills were to be seen, and the gorge through which the Rovuma breaks a little further up. The next large set of villages were Mtotela's, a very civil Nyassa chief; he and other Nyassa people were delighted to see my men, most of whom were of the same tribe. I have noticed that ideas of kindred are very strong with all these people. The idea that they do not wish to return to their own country arises from our not realising that they have no knowledge where their kindred are: they know that they were raided, and have very vague ideas of the route they followed; but Livingstone found that some of his boys would willingly give up the comfort they had with him to return to their kindred — and where I have gone, old associations, old ties, when found at all, heal up at once and attract the lost one. All the Nyassa people fraternise somewhat, but if a native does not at once wish to go to Nyassa we must remember the great size of the lake: he may have come from the south-west, and so does not want to go to the far distant north-east of Nyassa.

Beyond Mtotela's we found some friendly Makua's, but could not estimate the population, which was settled to a great extent on the islands. We passed Loundi, another Nyassa chief, and Mpingawandu, and crossed at Kanyenda's ferry. On the islands here is a considerable population, but very loosely united with Kanyenda. Here, as at Mtarika, caravans often cross, and some go down to Chitwanga. Thence the Kilwa road formerly lay by Majeje and the Yao and Donde, then by the Donde villages near Ilulu hill, but now caravans often strike across from Kanyenda's through the forest, only the Lindi parties going by Ilulu or Masasi. A day's journey took us from Kanyenda's to Chipajola, a Masanyinga Yao, who, I believe, has now moved to the Lujenda; the location seemed very fertile and the people were boldly living on the right bank of the Rovuma, not on islands. To this point some caravans

come across from Mwembe. Three days' journey brought us by a number of old clearings to Mpanda's, the edge of the debateable land that caravans only venture to skirt.

II. It would probably be some 80-100 miles further up the Rovuma that I crossed it to go to the Gwangwara country, and this takes us to the northern division of the region treated of in this paper, over a bridge of creeper and bamboos some 100 feet across. Advantage is taken of two tall trees overhanging the torrent; creepers are used as ropes to support a platform of bamboo on either side, and these are joined by other bamboos, cross-pieces being laid on, and then bamboos are bound on to overlap the joints till the whole is one long arch of bamboo only needing the creepers to steady it. I crossed similar bridges over the Luachesi near Mwembe, and over a stream near the Wa-bena country.

Once over this narrow bridge, we were soon passed by three Gwangwara, who regarded us with great suspicion and fear and would not come to parley; some sort of news had preceded our coming, however, as I had told those who raided the village near us on the lake that I was coming.

We soon found that the country was divided into small hills, and places like gravel pits, common there as near Mwembe, and at last found a Nindi village dependent on the Gwangwara. Here the men were mostly away, and we learnt that the Gwangwara had settled all the country round with Donde and Nindi people to cultivate for them; these dared not settle on the main path, or their masters would raid them as they went by. Here and there the path was festooned with handcuffs, probably rather neck-links, which had been taken off gangs of captives. These Nindi, at least the boys, had the Gwangwara scanty dress of skins, and top hat of feathers. The people were afraid to show us the way to their masters, but as we had fraternised with them over a dance that we had seen before at a Donde village near Masasi, a woman hinted that if we set off north we should soon find a path; and so we did, passing some deserted villages—probably the people had moved to a more sheltered place. In the evening we were met by two Gwangwara and a coast man, who said he was from Kilwa, and had come months before with a caravan. This man was very civil and helpful all along, having got into the confidence of the chief. The next day, after traversing low open ground, we again crossed the Rovuma, now a tiny little stream, and not far on found the first Zulu village. Here there was much delay and ambiguous answering, and we had time to observe the wealth of Indian corn, tobacco, and the beans called *baazi*. There were not many oxen at this village. Some men with me had to return to Masasi, and as it appeared that they would have to pass through another chief's village named Songea, they said they could not unless I went with them. Jazi or Mheruli, himself civil, said he could not give us a guide, as they were not on good terms; and we

found it very hard to get on at all. The people were evidently afraid of us, and we could only get information by sending a man out alone to question children. In this way we passed the source of the Rovuma, a large open glade with a tract of spongy ground in the middle. We were shown a hill in the distance from whence the Lufu is said to rise. At last we reached a village of Songea; we saw some elders there, but who they were I do not know; I here left our men from Masasi, and it is to the credit of the Gwangwara that none of them were hurt, though an attack was then in progress on our mission district of Masasi. I returned safely to Nyassa, and feel no doubt that we may venture amongst them and find a welcome, though difficulties may arise afterwards. As with the Donde and Nindi so with the Yao; we found these settled near Songea, and cultivating the land and paying tribute. So they deal with all who do homage to them. To do this is "Kugwira mwendo," that is, seize the chief's leg.

They seem to deal in the same way with Amakita. There are elements of good in the system, but they afflict all too much. I followed their war-path up from Chikala. Some had gone by Mkata and right up by Makanjila's; they had been seen from Mtonia, and had passed Unyango only a few weeks before I was there; they have long desolated the Rovuma, and at length reached our station at Masasi, some 200 miles distant. As I came down the east side of the lake I found a burnt village under the Livingstone Hills, and a little south the booths in which the Gwangwara lived just opposite the Lipingo village on piles.

As regards the language of the Gwangwara, the men with me who acted as interpreters had been with the Angone west of the lake, and the latter, as I am informed by Dr. Laws, of the Scotch mission west of Nyassa, speak the language of the Zulu. How much Zulu blood may be left is very doubtful; one chief assured me very little was left, but I am told that amongst the Zulus in the south great pains are taken to put an adopted boy on the same footing with those of the tribe, and this goes on regularly with those of the Gwangwara. The chief fraternised with me on the ground that we each wanted youths to educate on our own system. The women act as a great incentive to the men; they are said to expect a suitor to be the first to enter a stockade. They laughed at the youth of my porters, and said that with them none were allowed to marry till they had beards; the men wore the clay top-knot moulded round their head.

When asked as to their ancestors' graves they said they had been driven south from them; and when I bid farewell to the man who had acted as our host, and expressed a hope to see him again, he said, "Yes, if the Nyaka-Nyaka do not kill us all;" and, like the men at Songea's, he expressed a hope that Europeans would go and pacify these Nyaka-Nyaka. On leaving them I passed other villages and found how much they fear this northern tribe. Seeing the people thus at home, so

vivacious and full of family life, we could not but perceive that their fierce raids are due not to mere lust of rapine but to the impulses of a conquering people.

Their promise not to attack my station on the lake was kept, but they came very near it, both north and south, and to really master the situation in this region it seemed to me necessary to visit those who raid these raiders. No such tribe as the Nyaka-Nyaka is marked on any map, but one of my men, who had lived at Kilwa, said another name for them at that town was the Wa-bena, and that parties of them there had sometimes petitioned the Governor of Kilwa to let them have it out with parties of the Angone, as the Gwangwara are there called. The Wa-bena are marked on the map as inhabiting to the north-east of Nyassa. My quest of them led to an expedition from Kalonga's, a harbour west of Nyassa formed by sandbanks; thence we crossed the Urufilio, and then through the elephant swamp. South of the Urufilio the country was somewhat marshy, but fertile; semsen, sweet potatoes, tobacco, manioc, baazi, some mapira, and a little cotton were growing, with ground-nuts and pumpkins. Here we first saw boys marching double quick and keeping time by means of anklets that tinkled. Here the prevalence of the wind from the south was very marked by the upward turn of the branches of the cotton trees on that side. Crossing the Urufilio we had to partly swim, though a native managed to carry over two tiny children. These people, I suppose Wa-chungu, soon showed us a comfortable hut under a dark-leaved tree, the berries of which yield much oil.

Next day we passed some indiarubber trees; no elephants were seen, though there were many tracks of the animals. Across the Sangwa, a very considerable stream swollen by the rain, which we crossed in a canoe, we reached very neat villages, where one felt scruples as to cutting up the ground with tent-pins. The next day we passed several villages, all marked by the same neatness, and were followed by hundreds of natives with a great variety of spears, but no other dress save a zone of copper wire. A mere strip of red cloth here procured a fowl, and sour milk was freely offered us; in each hamlet the door of a chief's hut was marked by an unusually tall bamboo.

Large plantations of the arrow-shaped leaf called *jimbe* at Zanzibar, of great luxuriance, set off the sweet-potato patches. As we stood towards evening on the banks of a large river surrounded by hundreds of these fine-looking men, and the canoe carried our party across in two or three trips, I felt the value of their natural disposition that prompts to hospitality rather than to seize unprotected goods. However, the African Lakes Company had already made friends here, and I was welcomed to a house when we had crossed the river; it belonged to a man whose son had gone with some of the Scotch party down south, and returned in safety. The next day we came to the Rombashi, where numbers were crossing.

Here we met a mad person. Such people seem to be kindly treated; elsewhere they are often put in a slave-stick to quiet down, as the expression is. Mr. Stewart says this Rombashi is a mere lagoon, and there seemed no current; four or five miles brought us to Mambungo's village, which has often been described. Mambungo himself was a head taller than his people, and as slenderly clad; he soon gave us a hut and an ox, and again I was thankful that no spirit of covetousness came over him. My ten men were seized with a panic the second night, and declared we were to be killed, but their fear was groundless. I took advantage of our stay to explore their villages along the Lumbaka, and the name Rombashi seemed applied to the most crowded part as well as to the lagoon. Wading and reed-work brought me out on a strip of sand, while the south wind seemed to lash the lake against this northern shore. The Lumbaka came round this north end, but whether it was joined by the Lufila before it entered the lake, I could not tell. A village of Wa-kinga was said to be some short distance farther on.

Due north there was a remarkable rounded hill, and to its right a striking smaller hill. My route went over the former; and its spur to the east was separated from the steep sides of the Livingstone Hills by the Lufila. The sides of these hills were in the lower part marked by the Wa-kinga plantations.

Next day Mambungo entrusted three urchins to my charge, and I set off through his village. The people are herdsmen and gardeners. Flowering trees are plentiful in avenues. They make neat mats, spears, and their houses are well constructed. Their pots are said to come from the foot of the Livingstone Hills by water. Some 30 miles south, under that range, we subsequently met with canoes belonging to this chief. We, as others, were very much struck by the care taken of their fine oxen.

The Lumbaka soon took a turn to the north, and we came on it just where some 50 yards of the path had fallen away into the river; then we turned off more towards the volcanic (?) hill, and passed a stream—the Yangangwisi—and came to the foot of that hill to a small village. All the time we collected words and sought to interpret. The words for water, fish, goat, and the Nyassa itself were all quite different from those used further south.

Next day from the hill we got a magnificent view over to the hills of Kalonga's, a peak to the north, and its spurs out to the Livingstone range, while at my feet, between the hill and the lake, lay the alluvial plain formed by the Lumbaka and Lufila, and one or two miniature lakes in it, one of which we had visited the day before. It was touching to see the kindness of the people in offering an ox as we passed; we got also sweet potatoes at our midday halt, and walked over a down carpeted with crowsfoot and English flowers to Majonga. Here we had a grand palaver, and obtained guides to the next place. No one had heard of

the Wa-bena, or the Nyaka-Nyaka at all definitely, and I could only get on my men by insisting that we must go over the appalling hills to the north-east. It rained almost continually. We passed very large villages, and by the peak a road, probably direct to Merere. Round the summit we found another village, with a somewhat different dialect to that spoken by our temporary guide. Here we killed an ox Majonga had given us. Dense mists shut out the view. The people told us that Merere had often raided here, and cut off people's hands.

Next day I determined to make for the hills, and passed a stream that showed the different strata of the whole of this alluvial surface, about seven feet deep. We came, after about three miles and a half, to a village where the people were wondrously painted in stripes in preparation for a dance. It was near a spur from the Livingstone Hills, which we crossed in the afternoon, and said to be two days from Merere's (first day at Pilungo, second day Maranguli, third day at Merere).

Two miles across ridge and through defile brought us to Mambepo's, at the bottom of a steep hill. Near here a European (Mzungu) was said to have passed, but nearer the lake; otherwise we had heard little of Europeans since we left Mambungo's, where the chief remembered the names of Mr. Moir and Dr. Laws.

The next day, as the path to the north-east was said to be only a path for firewood, we reluctantly toiled up a great ascent nearly north, with a steep ravine on our right, and so at evening got a glorious view of the valley of the Luaha, looking from there just like another Nyassa; and leaving a valley and path that descended northwards, we soon reached a village. There the people were shy of us, and showed signs of insisting on our going to Merere. I went a long trip, passing over a stream that clearly enters the plain, and in coming back lost my way. Fortunately a funeral was going on where we were put up, and at last I heard the dirge come over the valley and managed to get to it. When I reached the spot the dancers went on grimly by the dim firelight in full war-paint, and took no notice of me or my appeal, which they could not understand; and I was glad to see one of my men appear on the scene. We ought to have gone down into the valley, and so to the Wa-bena, but our hosts hoped to keep us in reach, and so we were directed eastwards over the Waluga downs, and found ourselves with a long-taloned chief, Mala-wanda, who remembered Mr. Cotteril and his party, and pointed to the site of Merere's stockade below. Here all was cross-paths and old plantations: clearly the Wa-bena or other raiders had been in the neighbourhood. We now saw what was said to be the home of the Wa-bena, and up hill and over river we went, and down from the Waluga uplands, and across the spurs, and so to the border village of the tribe. We were taken for the party of the French traveller (M. Giraud?) who had recently passed across these

downs, and many thought we had failed and so come back. When at the Wa-bena village we skirted that spur; we were warned against trying to cross it, and were tired of climbing hills, and so we wound round it, continuing eastwards past a number of quadrangles inhabited by people formerly belonging to Merere, and now under the Wa-bena, or, as we now heard the ruling clique called, the Wa-jinga.

Our guide to the first Wa-bena village would not enter with us, although he knew many of the people there who had been under Merere; and at all the quadrangles they received us well, though troubled at our coming; we heard some old hags calling us wizards.

In this long slope of the plain there was high grass, and sand studded with thorn bushes and gay with convolvuli. We passed plenty of plantations, and half of each quadrangle being deserted, we got good lodging; but fowls were rare, and the goats about the place were said to belong to the Wa-bena.

Tobacco and mtama were grown freely. At the end of the afternoon we crossed a large sandy bed with little water, and found a lodging next day by a very large quadrangle. The chief did not seem to know of any other river but the one we should reach that day. About six miles' march by one long shallow pool brought us to a large quadrangle, near which was a river, very shallow but broad. One mile further brought us to a house.

Next day we walked seven miles to another quadrangle, and then over another stream, which we re-crossed twice after seven miles' travelling. Here the country became more undulating and higher, and we reached a place said by the frightened guides to be the real Wa-jinga's abode. The guides left us, and then we found ourselves engaged in trying to find a chief. Grand herds of oxen, wearing bells, made these downs lively; but food was very scarce, and the chief suspicious. He said first that he was the head chief; then that the chief lived two months off, and so on.

Next morning we were given two guides, fine-looking young men, who, by-the-bye, scorned any idea of a present when they landed us at another quadrangle, six miles further on. Here the people were bringing in the mtama harvest, and the men crowded round while I waited for our nine porters to come up. The chief here looked a fine fellow. Here, as before, they asked if my men were not from the Gwangwara, or, as they called them, the Wa-poma. Their having slit ears was indeed a sign that they had been at one time with the Angone west of Nyassa. A few miles further on we obtained a grand view to the north and west, and again after crossing two more brooks. At the latter place a man assured me that the water that was so often seen in the valley was indeed a large marsh, and that they expected raids on that side only in the dry season. We were again lodged that night, and bought a small ox. The absence of fowls was trying in a land where there seemed

plenty. The people are very cleanly, and bathe regularly, and laughed at my men for merely washing face and hands, whereas we had been laughing at the uncleanness of the hill-people. The women wore hides ornamented most elaborately, and even tastefully, with beads. The men carried bigger spears than the Amachiusa. They said that some charred buildings had been burnt by the Wa-poma, but the Gwangwara have evidently met their match on this side.

At last we were met by a messenger, who said the chief should be communicated with, and we were to wait. After three days' delay we determined to push on, as some said the chief was a day's journey off, others two months' journey, and so on, and we soon came to a large village and a number of paths. We were met on the road, and not a little pleased to be invited to a separate house, while only one of my men was allowed to go to the village; and we were so closely watched that I could not climb the hills some little way off. A chief came and gave us audience three days running, and professed to send off messages to another head chief. Our friend was in full dress, wrapped in bands of beads almost all over. They were suspicious, because we came from the wrong side. They knew nothing of Nyassa, but had traded to Bagamoyo. They represented themselves as attacked on all sides, but we had seen their work on Merere, and saw it afterwards east of Nyassa.

We were recommended to lay in provisions, and finally commanded to go back as we came. This was trying, as I was suffering from a large boil, and had to be carried three days. Near this last village we skirted a hill and crossed a brook, and finally a big path that clearly went south-west round the range.

Men were sent after us to see us well back the way we came; and at the last part it was very absurd to see our guides change their tone. At first they were protecting us, and my men turned pale as they saw our old friends at the quadrangles turn out in white and black war-paint; but I soon more and more suspected that our two Wa-jinga guides had as little command over these late followers of Merere as we had, and that we were the favourites. So we got back to the hills. We had hoped to strike across right through the Gwangwara country, but now we had no idea of the way. We marched across the downs by the way the French traveller had taken, and made further acquaintance with the Wa-luga, who seem to flee into the narrow ravines that are full of foliage, tall trees, and brushwood, whenever the Wa-bena raid them.

These upper downs are rich in flowers, but we did not find brushwood sufficient even to light a fire. When we were on the watershed we had a magnificent view of U-jinga and the U-sango hills and the valley of the Luaha. We soon after descended into a long valley, and after seven miles' walk along it past villages with high cone-like huts, and crossing the streams we reached the first village that claimed to be of the

Wa-kinga. Here, just [at dawn, we caught sight of the great plain of the Lumbaka below, lakelets and all, and the stream we passed yesterday cut into the hill like a knife. All the natives seemed to think that we wanted or ought to want to descend to Amambungwa's country; none knew anything of Mbampa, and so day after day we had to leave the westerly paths our guides got into and cross ridges. We had no way to ask for, this side of the lake being unknown; but finding at last that the Gwangwara are here called Wa-yoya, we could ask for the Wa-yoya war-path, although we could not tell if the people were really guiding us. We crossed a large stream that soon turned west, and climbed a very steep hill, thence in the evening following a narrow path hidden in mist, where we could hear the people shouting in the valley below, and here we found that coast caravans had been. Then we reached a very large valley, and a Kinga chief, named Ushalawile, who gave us an ox, and promised a guide to Wa-pelememo. All along here the houses were surrounded by pretty fences of euphorbia and other plants. Directly we reached the hills again we met with rain, but, to make amends for it, tender Indian corn cobs. Thence we passed the Liangali and reached another Kinga chief, who entertained us in the morning with a dance. Then we crossed the Anyawayo, and ascending caught a sight of the lake and saw the chief's village: Mwemushe's (his title seems to be Mhukilo) was to the west of our march and thence a road led down to the plain; to our west the hills rose higher than ever over Nyassa, and we went on and camped by a tall peak called Pkwawa. The next day we came to an end of these villages. All the Wa-kinga valleys are very beautiful and fairly populated; they said they have also lower lands, where their cattle are often sent. To the west the hills rise higher, rounded and peaked to the north-east. On the south they are bounded by the Lamkiu, which flows south-west into Nyassa. Between this and its small tributary the Nyelele we found the remnants of an oppressed people, and then ascending a mile or so we found the Wa-palameno, who gave us a wine distilled from the bamboos of the country. Crossing two more streams we came to many villages, and the next day ascended the eastern face of the Livingstone range again by a mount called Unsuti. Near the top was a village, and goats were there. From the top a lower terrace was visible to the west; on the east the hills rose as far as we could see to the north-east, but fell away to the south. We descended some five miles to a village; Nyassa was still hid by the dense fog. Even here marauders were dreaded, but whether Wa-bena or Angone we could not tell—probably the latter.

We went down by well-trodden paths enveloped in mist, and somewhat suddenly came to a place where you could look down sheer into Lake Nyassa. My ten men were rejoiced; it seemed an old friend, but we were not at home. A descent by rocks, like a ladder in some parts, brought us straight down on a village; the poor people thought we were marauders,

and as many as possible put off in canoes, returning only when they saw how few we were and that we did not burn the village. This and some other villages were clustered along the foot of the precipices. Further south, as Mr. Young has described in his book on Nyassa, they have built their huts on posts driven into the lake, and there they live, the scantily cultivated ledges of ground yielding them hardly any grain, and they do not seem to have much fish. One charred village on the shore told that the Gwangwara will not even so leave them in peace, but the villages on posts show that even a few yards from the bank the Gwangwara will not attack anything on the water. The regular visits of a friendly European would be an incalculable boon to these people, and to those who hide in the marshes, as in the great marsh that bounds the Lufu. All along that side from Sumba to Mbampa there is no path at all; we had to wade and plunge over rocks, now and again getting a lift in a canoe, now following hippopotamus tracks or skirting the reeds in the lake, neck-deep in places. It took us twelve days to reach Mbampa.

III. The southern division of the region now remains, and here Lake Chilwa, or Kilwa, is the principal object of interest. I first approached it from the north, but the notes I then took were unfortunately lost—I mean the levels, which I took carefully every day. We crossed the Mandimba, and ascending into the hills and by one or two small ranges made three days' journey south-east; we could then see Mangoche north-west, and leaving the main path, went due east till we reached a vast swamp of grass, only passable where elephants had been. We mounted a rock that rose up conspicuously, and could then see water and hills beyond, east and south-east, and an island in the water; our guide said this was called Chiuta. That day our guide deserted us, as he had pointed out where Europeans lived to the south, and I had said laughingly we would go to them.

I waded in towards the island, up to my waist and more, and the birds that thronged the place hardly took the trouble to flap out of the way. We followed this reedy edge all the next day, and saw herd upon herd of water-buck in the long reeds, when we struck a caravan route. It was very painful walking over dried-up elephants' tracks. This route took us near to the village of Amaramba, and a path through the reeds; the path had been cut for some hundreds of yards, and was all muddy, ending at water, and the cottages on posts in the river. Some cottages seemed to be on the other bank. Just before we crossed what in the wet season would be a considerable brook. The people of Amaramba are said never to take in a party till they have camped a night, and they would not have anything to say to us, except to tell us that there were crocodiles in the river when we threatened to swim to them. The people there are Yao, from near Mangoche. Evidently parties continually cross there. Some Alolo were said to have lately passed on a peaceful expedition.

The next day, following the Lujenda as near as we could, we reached the Mandimba, a considerable tributary. That in the dry season the Lujenda may not be continuous I can well imagine, as some 20 miles below the Mandimba I found a big pool, and apparently no current, stones above and below and hippopotami playing there; but there are hills on both sides of this marshy piece. In the dry season even the middle of Lake Kilwa would here and there be full of banks, for Mr. Buchanan told me that to reach the large island of Kilwa he was paddled in a canoe along a ditch with mud on each side, whereas in the wet season it would cover miles of country. What I actually saw was the water of the lake, and thence the reedy marsh extending by Amaramba, where also I saw water continuing to where I again saw it in the Lujenda, which I followed from thence down to Jambone hill. As to the extent of Kilwa, at several places I found the land between it and Pamalombe quite flat, 1457 feet above the sea; while my observations make Namkumba's, just above Nyassa, 1530 feet. Allowing for the fall of the Shiré and the height of Namkumba, this would make Shirwa, Pamalombe, and the land between them almost the same level.

No natives can be trusted in their statements with regard to these pools or Nyanjas. As we rounded Chikala and saw Shirwa before us, my porters from Blantyre insisted it was Nyassa, or as they called it, Nyanja of Mponda's; however, further north, when we reached the hills, a native pointed out Mchisi and where Chiuta would be, and said it was all one water with Shirwa which he knew south of Chikala.

Later we passed round the north side of Mlanji and found that the Mtuchila rises on that side, and runs round west and then south into the Ruo, and that the Pamalombe rises further east between Mlanji and Nyezi, and runs into Chilwa; the watershed of these two is very low.

Mounts Zomba and Chiradzula are well known; Mount Mlanji looks so very high owing to its base being lower than the base of Zomba. Mkanda at its north-west corner, and Njete, Manja and Matapwiri on the east side, all belong to the Yao tribe, and by the latter the caravan route passes from the Quilimane coast to Malemyas, &c., while the road to Wibo from the Makalolo passes by Chiradzula, and so to Zomba, and joins the other route there. I travelled to Quilimane by the less-known route. From Zomba, by Mlanji, and all down to the coast my route was a descent; the country seemed good. At the first village after Matapwiri the people talked a good deal in the Nyassa language with their Makua. One of my men could speak Makua as spoken at Masasi. All the way to the coast, they spoke of the Alomwe as living to the north-east, and as occasionally intermarrying with them. I made notes of the Makua language as often as I could. They noticeably retained the *mb* instead of *p*—as, *minemba* for

minipa, spirits. This route is clearly now the popular one for the old hands who used to hail from Zanzibar. I met men whom I had seen north of the lake; a Zanzibari, an old Masasi Makua, also Kilwa and Wibo people—every day band after band was met with, often a teacher with his alphabet-board, and once a large party under one of Tipo-Tipo's men, people from Makanjila's and Jumbé's, who eagerly asked me the news. Some of the streams we passed after leaving Mlanji entered the Lukungu, which was described as entering the Nyanja of Quilimane, or, as Quilimane is here called, Mirambo.

The people, Makua or other, near Matapwiri were mostly under the authority of Manja, whose village was full of coast men. The river Mlosa rises at Mlanji, and doubling round its south-east end enters the Ruo, leaving Mtumbwi on the right. The flowers, especially gladioli, were very bright on the way down; low ridges came all round south-south-east, probably low rocks left by the streams as the land sinks down to the coast. From the Makua village we crossed the Lumanama. Here the natives seemed as fearful and ignorant of distances as anywhere. We could hardly get a porter to carry our beans. We passed several hamlets and a stream named Misesa, and at last a pool in an open place, and then reached the small river Majoka. Here we mounted a rock and got a fair view of Mlanji in the distance, and a high hill, doubtless Mount Chipirone. Another day's journey brought us to Mpasu's villages and their mango, cashew, and orange trees and pine-apples, on the banks of the stream Namasona. All the way rocks cropped up at times. At last, three days from the coast, we found a man, named Mchilembwa, who knew the Portuguese, but not one of them was seen. We reached the place to which caravans are allowed to come and trade. Here coconut palms, cashew-nut trees, and limes were abundant. A man, son of an Indian and a Makua woman, who has become a Christian, presides, and was very attentive to us. Several Indians had goods-stores there, and already had news of a caravan we had passed on the way. A regular marsh and a long road in a river led to a place where there was an office with a Goalese clerk, and Indian helper; and there we got a boat, and so descended the Mikwali, which we had before crossed four times, and we did not see a Portuguese till we were in Quilimane.

This does not seem the place to enlarge on the Portuguese settlements, on the slave trade, or the caravan life that knits all together from East to Central Africa. Almost everywhere I have travelled with natives only, my party being less than ten, and I have tried to enter into their life; thus I have been enabled to lay before you the routes they use, though my map may lack scientific accuracy. Any one now, by asking his way from one place to another, and noting the distance, could traverse the whole country, knowing the direction he had to go, and how many days' provision he would need.

Previous to the reading of the above:—

The PRESIDENT said the region to be described by Mr. Johnson was that lying along the eastern shores of Lake Nyassa, a country made famous by the discoveries of Livingstone. Mr. Johnson was already well known to the Society. He had spent seven years near the lake, acting as one of the Universities' Mission; and it was well to remember what important services had been rendered to geography by the missionaries of the various denominations in Africa. All those who read the newspapers must have observed during the discussions about Madagascar the unfair, ungenerous tone, assumed by the French papers towards English missionaries. They were represented as men who, under the disguise of advancing the cause of religion and civilisation, really went out for the purpose of extending British territory and increasing British commerce, and as filled with hate to other nations, regarding them as wanting in all the virtues which Englishmen possessed. Englishmen, however, remembered the great services rendered not only to the cause for which they primarily laboured, but also to the cause of geography, by such venerable names as those of Moffat and Livingstone, and were grateful for the living labours of men like Chauncy Maples and Mr. Johnson in the south-east of Africa, as well as for those of several members of the Baptist Mission on the Congo, such as Mr. Bentley, who had recently returned to England, Mr. Comber, and others. They also bore in mind the great services performed by Dr. Laws and Mr. Stewart on Lake Nyassa, as well as by Mr. Wakefield among the tribes near Mombasa and the Gallas. In Madagascar the great missionary Ellis had extended our knowledge of that island, and introduced civilisation and Christianity, which had advanced, among the Hovas especially, to a degree which was altogether unlooked for. Those who were present would also remember the most interesting account given of that island by Mr. Deans Cowan, of the Scotch Presbyterian Church. This was the stuff of which our missionaries were made. They were men of whom England might be justly proud, and among their number there was no one more devoted to the cause than the gentleman who was now about to address them.

After the reading of the paper,

The Rev. HORACE WALLER said that the natives in the part of Africa which Mr. Johnson had just described were very quick to sum up a man. If he happened to be tall they likened him perhaps to a giraffe, if he were small perhaps to a toad, and the nickname they gave to Mr. Johnson was "The man who never sits down," and he thought that these wanderings delineated on the map justified their assertion! Every one who had visited the region gave the same account as to the whole of the tribes being in a constant state of ferment. When he (Mr. Waller) lived to the south of Lake Shirwa, the Portuguese were taking the natives out of the district as fast as possible, and away to the west of the Zambesi, to trade them with the Kafirs for ivory. Mr. Johnson had put the best possible face on the question of the slave trade, but if he were closely questioned he would no doubt admit that tens of thousands of slaves were taken down to the vicinity of the island of Ibo, a Portuguese possession, and were sent on to Madagascar and the Comoro Islands. At the same time it was only right to say that a difficulty had arisen which was not formerly anticipated. Owing to the development of the indiarubber and the gum copal trade a vast number of natives who were brought as slaves across Nyassa were absorbed by chiefs who found it worth their while to employ large gangs of labourers in obtaining indiarubber. Mr. Johnson was now trying to get a steamer for Lake Nyassa, so that he might move about more readily. Like a brave man he had attacked the very centre of the evil. The Gwangwara were at present harrying the whole of the country. They were an offshoot of the Zulu tribe who were driven away across the Zambesi during the desolating wars of Chaka about 30 years ago,

and they were now preying upon the lake tribes. One of the principal terrors of that part of the continent was Tipó-Tipó. The whole region to the west of Tanganyika and Bangweolo to an indefinite distance towards the West Coast was being destroyed by organised bands that went about capturing the people and selling them for ivory. He did not think things would improve if the wandering spirit of the natives spoken of by Mr. Johnson led them to join Tipó-Tipó. When Livingstone was at the village of Matakas, he wrote a very sad letter, regretting very much that Bishop Mackenzie was dead, and all those who went out with him were withdrawn from Zanzibar. He thought that for some time at least all hopes of improving the people and going about among them was at an end. If his brave spirit could now go with Mr. Johnson or Dr. Laws he would find how completely needless his forebodings were. It was a matter to be thankful to God for that for every Englishman who died there ten others were ready to spring out of his ashes, and Mr. Johnson would take back with him a great following, not only of interest, but of men. Mr. Johnson had omitted to state that the greatest fellowship and kindness prevailed among the different Lake missionaries of various Churches. A clergyman from Cape Colony, who spoke the Zulu language perfectly, was about to go among the Gwangwara. If the eyes and hearts of the people could be opened to recognise the blessings of peace the whole of the tribes there would be benefited, for at present their lives were hardly worth living.

The Rev. W. P. JOHNSON said that the expense of his travels near Nyassa was a little over 400*l.*, which he believed was but the estimate for two months of an ordinary African expedition. The lowness of the cost was owing to the hospitality of his native friends.

Sir T. FOWELL BUXTON thanked Mr. Johnson for his extremely interesting paper. No one could look at the map without observing what rapid advances had been made in the knowledge of the regions which had just been described. It should be remembered that Mr. Johnson did not go there specially for geographical purposes; still he had brought home a great deal of geographical knowledge. If there were any society before whom his paper should have been read rather than before the Geographical Society it was the Alpine Club, for he had ascended a great number of peaks, and discovered many new passes, and it was to be hoped that when he returned to the region his labours would be crowned with still greater success. If a steamer would really aid him in his investigations, they must all hope that he would get one; but it would be a matter of regret if the possession of the steamer kept him from wandering about among the mountains and plains over which he had travelled with such great success.

The PRESIDENT joined very heartily with Sir T. Fowell Buxton and Mr. Waller in the eulogy that had been passed upon Mr. Johnson's interesting address. He had brought most vividly before the Society the state of things in those wild regions, and had shown them how some inhabitants were peaceful and cowardly, and others warlike, and thinking of nothing but plunder. At the same time he had shown that both among the oppressed and oppressors there existed a considerable amount of genuine kindness of heart. His account of his travels encouraged the hope that a great work would be done by Christian missionaries in that part of the world. Doubts sometimes arose as to whether Christianity could take root among a people so barbarous and ignorant, but it was evident that they had many feelings in common with ourselves, and that there was a great deal of good to work upon. Every one who had heard Mr. Johnson's address must recognise that there was a fair prospect of civilisation being introduced into those countries with the same blessed effects that followed the abolition of the slave trade in the neighbourhood of Zanzibar. While he listened to the address he could not help contrasting the picture which was

drawn with that given by Dryden in the reign of Charles II. The poet said the Protestants left the Roman Catholic Church to do all the missionary work, and did nothing themselves but send the greatest villains in England to plunder and ravage the distant Indian coasts—

“Thieves, pandars, pallards, rogues of every sort.
Those are the manufactures we export.
And these the missionaries our zeal has made,
For, be it with my country's pardon said,
Religion is the least of all our trade.”

GEOGRAPHICAL NOTES.

Mr. H. H. Johnston at Kilimanjaro.—We have just received the following interesting letter from Mr. Johnston, dated June 18th, from “Uvura, in Chagga, altitude 5000 feet.—For nearly a week now I have been settled on Kilimanjaro, camped on one of the loveliest sites in the world. Above me towers into the deep blue heaven the snowy head of Kibó, around me are green hills and forest-clad ravines in whose profound depths great cascades of water leap from rock to rock and splash the fronds of luxuriant ferns; before me lies spread out a vast blue plain—‘all the world’ as my host, the chief Mandara, proudly says, and my view southward is only bounded by the distant horizon. Perched as I am up here on the shoulder of a great buttress of the mountain, I seem to be on a level with the uppermost flight of the vultures, who hardly ever soar higher, and who poise themselves and wheel in circles over the awful depths at my feet. When the first cares of my installation are over I am going to set to work on a picture such as I see before me, and call the view ‘à vol de vautour.’—This is the bright side of my affairs; lovely scenery, a fine climate, trusty servants, and congenial studies. The darker prospects are the being in the power of, and subjected to the capricious interference of an African tyrant, whose favour at present shines on me, but who may in a moment change his mind and shatter all my castles in the air. Many people will be disposed to ask me, Why did you put yourself in his power? Why not go to some part of the mountain where the country is uninhabited and where you would be in complete freedom to pursue your investigations? To this I would reply that there is no habitable part of Kilimanjaro without an owner. It may seem very nice to go and live in a primeval forest 10,000 feet above the sea, and feed on wood-pigeons and guinea-fowl, but it is impracticable. When you have thirty lusty men to feed they object to such slender fare as the forest provides; consequently a settlement must be formed sufficiently near a native village for food to be easily procurable. It is, further, impossible for these natives of the warm coast-lands to endure the severe cold at night which is met with at an altitude of 10,000 feet. Consequently, as a central station, a lower

altitude is preferable. Finally, in going to Mandara I have but one tyrant to deal with; in the Taveta or Masai countries their name is legion; every petty chief must have his present; they are disunited in their friendships and united in their enmities. Mandara, too, holds Sir John Kirk in great awe, and has treated me much better than my predecessors, purely because I came with two formidable letters of recommendation from the Consul, one in Swahili, and one in Arabic. Let us hope, therefore, that he will leave me in peace to roam over the hills, to shoot and skin my birds and mammals, collect my insects, press my plants, and paint my pictures."

New Guinea Expeditions.—A second expedition into the interior of New Guinea, sent out by the enterprising proprietors of the *Melbourne Age*, returned to Thursday Island on the 9th of June. It consisted of Captain Strahan (leader), Mr. Walker, reporter, Mr. Stewart, naturalist, Mr. Scott, gold miner, and Mr. Kenny, a sailor. The expedition entered by the Mai Kassa, or Baxter river (to the west of the mouth of the Fly river), on the 7th of May, and explored the interior for a distance of 120 miles, discovering "splendid country." They report having discovered and partly explored twelve new rivers, many of them very large and deep. On the 24th of May they fell in with hostile natives and had to abandon their boat and retreat to the coast, which they reached on May 29th. Kenny was wounded by an arrow in the foot, and it is feared that Scott lost his life in attempting to proceed from the mainland to the island of Saibai on a bamboo raft. The native missionaries on Saibai rescued the remainder of the party and took them to Mabral where assistance was given them to proceed to Thursday Island.—According to a paragraph in an Australian paper, the Geographical Society of Australasia, at Sydney, have invited General McIver to attend a special meeting of the Society for the purpose of explaining and discussing his proposal to organise an exploring expedition into the interior of New Guinea. It is stated that a deputation from the Society, headed by the President, Sir Edward Strickland, waited upon the General for this purpose.

Lieutenant Greely's Expedition.—Among the further details which have been published in American newspapers regarding this expedition, likely to be memorable for the work it has performed as well as for its tragic ending, we cull the following as of geographical interest. The tide at the northern end of Smith Sound flowed from the north; at Cape Sabine from the south; the northern tide being two degrees warmer than the southern; in Lady Franklin Bay it rose eight feet, at Cape Sabine twelve feet. At the furthest point north which Lieut. Lockwood reached there was no polar current, nor did he discover any open sea. The coast of Greenland trended in a north-easterly direction as far as it could be seen. The experience of both Dr. Pavy, who, with

Sergeant Rice, made a short excursion on the track of Captain Markham, and Lieut. Lockwood, with regard to the pack in the Palæocrystic Sea, seems to Lieut. Greely to prove almost certainly the existence of an open Polar sea.—With regard to the high northern latitude ($83^{\circ} 24' 5''$) claimed to have been reached by Lieut. Lockwood and Sergeant Brainerd, Mr. C. R. Markham, in a communication to the *Pall Mall Gazette* of August 20th, makes the following remarks:—"I believe this to be a mistake, judging solely from the data that have hitherto been published. It is stated in the published accounts that the Cape Britannia of Captain Beaumont (the most distant point he saw) was visible from Lincoln Bay on the coast side of Robeson Channel. But the real Cape Britannia is not visible from Lincoln Bay. The most distant land visible from Lincoln Bay is Cape May, with Mount Hooker, consequently when Lockwood and Brainerd struck across the pack direct from Cape Bryant—the point they reached was not Cape Britannia, as they thought, but Cape May. The next and furthest land they reached was Beaumont Island, with a small island between it and the main land of Cape Britannia, exactly as they describe. These features are shown in Captain Beaumont's careful sketches made on the spot. So that their highest latitude was about $82^{\circ} 55'$. This is the deduction from the accounts already published: it may call for revision when the full journal and observations are accessible to the public and have been carefully scrutinised. It is, however, a matter of slight importance. With regard to the admirable way in which the journey was conducted by the two American officers, to their zeal and devotion, there cannot be two opinions."

The Danish Expedition to Greenland.—A report of considerable interest has been received from the Danish Expedition, under Lieutenants Holm and Garde, which since last year has been exploring the east coast of Greenland. It is dated Namortalik, March 1884, the winter quarters of the expedition, a station situated about 50 miles as the crow flies from Cape Farewell. After an excursion of two months and a half duration, during which part of the east coast was explored, the expedition returned on September 15th to Namortalik, or, as it is also called, Björnorten (the bear haunts), from the many polar bears in the neighbourhood; as, however, the huts for wintering were not then finished, the expedition started for a week's further excursion to the Fredriksdalsfiord, between Namortalik and Cape Farewell.—It was not until the latter half of October that the expedition could commence their regular scientific observations at the station, but after that date they were continued throughout the winter. As, however, the main object of the expedition was to explore the east coast by boats, the scientific observations have not been so rich as for instance those of the Danish International Expedition at Godthaab in 1882–83, but every effort has been made to follow the programme of the International Polar

Commission. The meteorological observations were made every third hour from 8 P.M. to 8 A.M., while the magnetic observations were made every hour except at 3 and 4 A.M. On the 1st and 5th of every month the magnetic instruments were read every fifth minute during eight hours and every twentieth second during one hour. With reference to the climatological conditions of the east coast, we learn that the winter is very raw and severe, although it cannot be said to be of excessive duration. The pleasant, calm, frosty weather which is experienced in North Greenland seldom prevails on the east coast, but in its stead frequent changes, with violent storms, there being one day 20° Centigrade of frost and the next several degrees of heat, while heavy rains and snows alternate. In consequence of these sudden changes it is impossible in East Greenland to employ the mode of locomotion so valuable in other parts, viz. the dog-sleigh; the only means of conveyance here being the boat. If the sea is frozen over the inhabitants have to remain where they are, and wait patiently until a higher temperature removes the obstacle. The ice thus never becomes strong enough to support a man and sleigh. Up to January last the temperature had not sunk lower than - 15°·5 Cent.—about Christmas—the thermometer standing at - 4° to - 6°, and even on some days not lower than zero Cent. = 32° Fahr. This was particularly the case whilst the north-east "Föhn" winds prevailed, to which South-east Greenland is indebted for its comparatively mild climate in the winter; but there are places where the ice lies firmly throughout this season. On December 5th, during a Föhn wind, the thermometer rose to + 10° Cent. After the new year the cold began to be severer and the Föhn winds less frequent. Towards the end of January and in February the thermometer sometimes registered 20° Cent. of frost, and on March 9th it fell to - 21°·5, the lowest temperature of the winter.—Some interesting facts are given regarding the district in which the expedition wintered. The station Namortalik is described as situated on an island, and as having a population of about 250 souls. The island, which bears the same name, is surrounded by several others, which, lying further out in the ocean, are during the spring visited by the natives, who catch seals and eiders there. To the north the Greenland landscape displays itself in all its grandeur and beauty, a scene of wild mountains, with lofty cones rising above the clouds. This is on the beautiful but almost unapproachable island of Sermerok. If the air be clear and the weather calm and sunny the little island lies so peacefully in the ocean that one feels tempted to climb the lofty mountains, but when the storm howls around the peaks, half hidden in drifting clouds, and the Polar ocean is a mass of foam, the giant forms of the mountains deter even the boldest. The mainland is rugged like the island just mentioned; in fact the whole southern part of Greenland is a region of wild mountains, furrowed by tremendous ravines, and rising in peaks to a height of nearly 8000 feet,

from which enormous glaciers descend to the sea. The landscape produces by its wildness and desolation a very striking impression.—There are thirty little turf-covered houses at Namortalik, including a bakery and a brewery. The so-called “Royal Commerce of Greenland,” a company, has also a depôt here. There is, besides, a Lutheran mission, a church, and a school attended to by a half-caste Greenlander.—The expedition has erected two observatories on the rocks, about 1000 feet from their dwelling-house, but connected by a telephone. Close to Namortalik is the Tasermiut fiord, some 50 miles in length, one of the loveliest in South Greenland. On its shores the vegetation is in the summer very luxuriant, and the heat and mosquitoes are so troublesome that one might fancy oneself in the tropics. This fiord is of great importance to the Namortalik people, as its shores provide them with fuel, its streams and water with salmon, seals, and herrings, and its mountain slopes with ptarmigans, Polar hares, foxes, and bears. In April the expedition intended to leave their quarters, and continue the exploration of the east coast. One-half of the members return next winter to Namortalik, while the other are to spend their second winter in a suitable place on the east coast. The expedition will return in the autumn of 1885.

CORRESPONDENCE.

The Identification of the Pinarus with the River Piyas.

DUBLIN, Aug. 11, 1884.

SIR,—Would you allow me to reply, as briefly as I can, to the objections raised by Mr. Ainsworth and Mr. Bunbury, to my identification of the Pinarus with the river Piyas.

I regret that the briefness of my remarks led Mr. Ainsworth to think that my identification was based upon Arrian's remark that Alexander was delighted when he found that Darius had moved from the broader into the narrower part of the plain.

My reasons were those which would naturally occur to a soldier who had studied the question on the ground, or with the aid of a good map. They were chiefly:—

1. The front which would be occupied by Alexander's army drawn up in the Macedonian “order of battle.” That front would be about a mile and a half; a distance which agrees with that between the mountains and the sea at the river Piyas, and also with the statement of Callisthenes that Darius encamped on the Pinarus “at a place where the distance between the mountains and the sea was not more than 14 stadia.” The distance between the mountains and the sea at the Deli Chai is over five miles, and if Alexander had advanced to that stream his army would have been outflanked by the Persians, and he would have lost all the advantages of position which he gained by fighting on the Piyas stream.

2. The head of Alexander's army was at the Marble Gates at dawn on the day of the battle; the army had made a night march from Myriandrus, and when day broke it was, necessarily, a long straggling column, with a very narrow front, stretching back over the rough rocky ground to the south. The Piyas stream is about five miles from the Gates, the Deli Chai over ten miles, and it seems to me impossible to

reconcile the descriptions of the battle with the view that Alexander deployed his long column into line and marched over ten miles before commencing the battle. My reading of the various accounts is that Alexander came into contact with the Persian outposts shortly after leaving the Gates, and that the action became general as soon as he had room to deploy his whole force. This would have been at the river Piyas.

3. The topographical features on the Piyas river are in agreement with the indications contained in the narratives of the battle; those on the Deli Chai are not.

4. The position of Issus, in regard to which I am at variance with Mr. Ainsworth, and the fact that it was some distance to the north of the Pinarus.

I am sorry that I cannot agree with Mr. Bunbury's view of Alexander's position and Arrian's remark. Darius by crossing the Amanus (Baghché) Pass, and by occupying Issus, cut the sole line of communication of the Macedonian army and placed Alexander in one of the most critical positions in which a commander could find himself. Alexander is not likely to have been pleased on this account, but he was naturally delighted when he found that Darius, after gaining a decided strategical success, had committed the grave tactical error of advancing to ground so confined as to neutralise all the advantages which he might otherwise have derived from his superior numbers. Alexander's conspicuous capacity as a commander was shown at Issus by his instantaneous recognition of Darius' blunder; by his immediate decision to attack at once, before the blunder could be repaired; and by the vigour with which he pressed his attack at the point where success would lead to victory.

I confess that I cannot understand the details of the battle if the battle-field be placed ten miles from the Gates, as Mr. Ainsworth and Mr. Bunbury suggest, but the discussion of the question would occupy more space than you could give me in the 'Proceedings.' I hope, however, to offer a paper on the subject next winter to the Royal United Service Institution, and I trust Mr. Ainsworth and Mr. Bunbury will honour me with their presence when it is read, and continue the discussion.

I was not aware that Mr. Ainsworth had travelled through the gorge of the Pyramus; I do not remember any notice of such a journey in his published works; and on Chesney's map the Jaihûn is shown by a dotted line with the remark "supposed course of the Jaihûn." I was under the impression that Mr. Ainsworth followed the well-known road from Marash to Kars which is indicated on Chesney's map; this, however, is much to the north of Captain Bennet's route which followed the course of the river through the gorge.

I am, your obedient servant,

C. W. WILSON.

The Assistant-Secretary R.G.S.

PROCEEDINGS OF FOREIGN SOCIETIES.

Geographical Society of Stockholm.—March 21st, 1884 [Supplement to the Report given in the 'Proceedings R.G.S.,' *ante*, p. 352].—On the conclusion of Dr. N. Ekholm's account of the Swedish Scientific Expedition to Spitzbergen 1882-83, Baron Nordenskiöld addressed the meeting. The speaker began by saying that he congratulated the previous speaker on the success of his undertaking, but he felt bound to state that there was one point in the same to which he must take exception, viz. that he (Dr. Ekholm) had named the spot in which the expedition wintered "Smith's Observatory." Against this he was obliged to lodge an emphatic protest. He did not do so from any personal feeling with reference to this gentleman—Mr. Smith*—as the despatch of the expedition was due to his munificence, but

* A Swedish gentleman.

by the reason of a place having been renamed, which had already a distinct geographical name. The Baron proceeded to say that it was rather a weakness of explorers to rename places which already had a recognised name. This place had a history in the literature of the geography of Spitzbergen eclipsed by few in the Arctic regions. In early days it had been frequently visited by Dutchmen, Englishmen, Russians, and Norwegians, although its history first began in 1861, when it was visited by the Swedish expedition of that year, and was then explored by Prof. Blomstrand, who brought home some remarkable fossils. In 1864 another expedition, under the speaker, sojourned for a long time at the place, when it was fully defined on the chart. It was then named *Cape Thordsen*, from the name of the vessel of the expedition. Further, large and valuable collections of fossils were then brought home from the locality, whereby the spot had obtained a recognised name in the literature of geology. Again, in 1871 another expedition visited Cape Thordsen, and a second time the name figured in scientific literature. By the proposal made to the powers by Sweden for annexing Spitzbergen—which led to a large diplomatic correspondence—the name became, furthermore, inscribed in diplomatic history. Finally, he pointed out that a Swedish company had attempted to found a colony at Cape Thordsen in order to work the phosphate deposits there, erected the buildings, built a tramway, &c., which had, on the company failing, been purchased by Dr. Oscar Dickson and the speaker, to whom they still belonged. He considered it somewhat strange that the recent expedition, who were really only guests, should have attempted to give a new name to the house of their hosts. He further reminded the audience that in this house at Cape Thordsen, one of the saddest and most terrible events in the history of Polar voyages had occurred, viz. the deaths from scurvy in 1873 of seventeen Norwegian hunters, who were shipwrecked here. In conclusion he (the Baron) might add, that in consequence of the stores at Cape Thordsen some years ago being plundered by Norwegian fishermen, its name had been recorded in the journals of the Norwegian Law Courts, which imprisoned the offenders, and in the annals of the Norwegian Storting. The speaker adduced all these facts for the purpose of demonstrating that Cape Thordsen was a name which had obtained a recognised place in the literature of geography, geology, travel, diplomacy, and law, and it was with these facts before him that he protested against renaming the place “Smith’s Observatory,” a protest which he trusted would be recorded by those Societies which had given publicity to the address of Dr. Ekholm.

NEW BOOKS.

(By E. C. RYB, *Librarian R.G.S.*)

ASIA.

Méjow, V. I.—Recueil du Turkestan, comprenant des livres et des articles sur l’Asie Centrale en général et le Province du Turkestan en particulier. Composés sous les Auspices du Général Gouverneur du Turkestan, M. G. Tschernyáow. Tomes 151–300. L’Indicateur systématique et alphabétique. St. Pétersbourg (no publisher’s name given) : 1884, 4to., pp. (6) and 167.

The library is indebted to Mr. Josiah Pierce, F.R.G.S., for a copy of this recently published second part of the work commenced under the auspices of the late General Kaufmann in 1878, and of which an edition with French title and preface (it also exists wholly in Russian, and Mr. Pierce has presented it in that

language) was included in the second supplement of the R. G. S. Library Catalogue, p. 219.

M. Méjof, in the preface to this first part, states that he had for the then past ten years been engaged on the formation of a collection of books and articles bearing upon Turkistan, and contained in 200 large volumes, uniformly bound,—an amount of literature which, as he says, sufficiently proves the interest taken in “our new conquests in Central Asia.” This first part contains bibliographical references to the first 150 volumes of the collection, containing 2007 entries, in the language of the original publication of each, and with three indices, the first and second in Russian, of authors, localities, &c., fully given, and the third a condensed one in other languages. Three-fourths of this literature is in Russian, a fact to which the compiler refers with pride, adding that the chief aim of his country is not increase of territory, but the development and establishment of its commerce with the Khanates, “and perhaps even with India.”

The second part, now published, treats in like manner of vols. 151 to 300 of the collection (now amounting to 338 vols.), giving 1397 entries; and it is stated that the number of books and articles now reaches 4000, including many rarities. Among these are included “all the numbers of the famous Blue Book of the English Parliament concerning the Asiatic Question;” and M. Méjof concludes by saying that “Even our neighbours, the English, have understood the utility and necessity of a similar collection,” which he understands has recently been commenced at Calcutta.

Saint-Pol Lias, X. Bran de.—De France à Sumatra, par Java, Singapour, et Pinang. Les Anthropophages. Paris (Oudin): 1884, 12mo., pp. 394, map and illustrations [no index].

A general account of the author's journeys from 1880, especially as regards his stay in Java, his experiences in Perak and (in part) Atchin having been separately published and noticed in our ‘Proceedings.’ A further volume on Atché-Bécar (Great Atchin) is announced. Various illustrations of scenery, buildings, &c., are given, chiefly from photographs; and the work concludes with a chapter on the Orang-Battak, “Anthropophages,” of the interior of Sumatra.

AFRICA.

Walker, [Rev.] F. A.—Nine hundred miles up the Nile. November 3rd—February 9th, 1884. London (West, Newman & Co.): 1884, 8vo., pp. vii. and 234.

Incidents of a tour, chiefly with archaeological objects, in which the author reached as far south as Abou-Simbel, above Korosko. Temperatures, and plants and insects observed, are noted among other things in the appendix.

AMERICA.

[Argentine Republic.]—Catalogue de l'Exposition Argentine, arrangée par la Société de Géographie de Brème dans la Salle du Tivoli, Mai-Juin 1884. Brème (Von Halem): 1884, 8vo., pp. 79, map.

This Exhibition Catalogue (after a sketch of the geography of the Argentine States) contains among other things lists of the woods with their scientific and popular names, and of plants of economic importance treated in the like way. A list is also given of the collection of maps exhibited: the one accompanying the Catalogue is on the scale of 1 : 9,000,000.

Carrasco, Gabriel.—Descripción geográfica y estadística de la Provincia de Santa-Fé. Tercera Edición. Rosario (Imprenta de Carrasco): 1884, 8vo., pp. xv. and 297, map, plan, and pls.

After a description (in more or less general terms) of the boundaries, hydrography, soil, climatology, temperature, natural products, stock-raising capability, and zoology of the Province of Santa-Fé, its topography, departments and divisions, means of communication, population, administration, industries, &c.

are more fully entered into. A general map is given, with plan of Rosario; the plates represent buildings and national works. The so-called index is a mere summary of contents.

Fleming, Sandford.—England and Canada. A summer tour between Old and New Westminster. With historical notes. London (Sampson Low & Co.): 1884, post 8vo., pp. xi. and 449, map. Price 6s.

An opportune publication, having regard to the visit of the British Association to Canada, by an author whose former practical acquaintance with the country during his work on the Canadian Pacific Railway Surveys, has rendered him an authority. In 1883 he returned to England, but very soon recrossed the Atlantic, and reached the Rocky Mountains by the Canadian Pacific. From Calgary, he ascended the summit of the Rockies, and then followed the Kicking-Horse Valley to the valley of the Columbia, ascending the Selkirk range and arriving at Kamloops by the Ille-Celle-Waet and the Eagle Pass. All this portion, after leaving the terminus of the railway, is practically new ground; and the description of the nature of the country and incidents of travel carries the reader back to the days of early exploration in the North American continent. After a stay in British Columbia, the author returned by the Northern Pacific. Historical and political notes of interest accompany the narrative.

OCEANIA.

Anrep-Elmpt, [Graf] Reinhold.—Die Sandwich-Inseln, oder das Inselreich von Hawaii. Leipzig (Friedrich): 1885 [1884], 8vo., pp. xxii. and 367. (*Dulau*: price 8s.)

The first 87 pages contain the author's personal experiences during a tour of some three months in Honolulu, Kauai, and Hawaii. The bulky remainder of the volume consists of dissertations on European influences, native habits and customs, and general observations, followed by an historical account which occupies more than half the book, and chiefly concerns the stages of development of the Kameháméha dynasty. A segmented table of contents, in single line, is substituted for the more useful index.

ARCTIC.

Mackintosh, A. W.—A whaling cruise in the Arctic Regions. London (Hamilton, Adams, & Co.): 1884, post 8vo., pp. vi. and 118.

The diary of the deceased author (surgeon on a whaling vessel), published by his brother, and containing the usual incidents of sea-life on the Western Greenland coast, with slight references to the settlements.

Tollens, Hendrik.—The Hollanders in Nova Zembla [1596–1597]. An Arctic Poem, translated from the Dutch of Hendrik Tollens by Daniel Van Pelt, A.M. With a Preface and an Historical Introduction by Samuel Richard Van Campen, F.R.G.S., &c., including Notes. New York and London (G. P. Putnam's Sons): 1884, cr. 8vo., pp. xviii. and 120, frontispiece.

This new version of "De Overwintering der Hollanders op Nova Zembla" is to be noticed here for the historical introduction by Mr. Van Campen, which contains a well-written epitome of the 1596 expedition under Heemskerck and Van der Ryp, with Barents and Gerrit de Veer, during which Barents died.

GENERAL.

Bordier, [Dr.] A.—La Colonisation Scientifique et les Colonies Françaises. Paris (Reinwald): 1884, 8vo., pp. x. and 506. (*Dulau*: price 6s.)

Dr. Bordier, Professor of Medical Geography at the School of Anthropology, has already published a valuable work on that subject which has been noticed in the R. G. S. 'Proceedings'; he now essays to formulate the principles

scientific colonisation, and to apply them to French colonies in detail. After a general view of human migrations in gross, the questions of minor emigration, the conditions of the individual as emigrant and immigrant, choice of colonists and colonies, and colonial hygiene, are separately discussed in detail, special importance being attributed to geographical points, the results of acclimatisation of animals and vegetables, and the influence of man's work upon nature. This portion of the work is of general interest and value; the remainder refers to Algeria, Senegal, the Guinea Coast, Gaboon, Obock, Reunion, Mayotte, Nossi Bé, Ste. Marie de Madagascar, the French Hindostan stations (Mahé, Karikal, Pondicherry, Yanaon, Chandernagor, and minor places), Cochin China, Tahiti, the Marquesas, Gambier and Paumotu Islands, New Caledonia, French Guiana, the Antilles, and St. Pierre and Miquelon; and gives in a condensed form information to be found in the current French official Colonial publications.

Tiele, P. A.—*Niederlandsche Bibliographie van Land- en Volkenkunde.* Amsterdam (Frederik Muller & Co.): 1884, large 8vo., pp. vii. and 288. (*Grevel*: price 8s. 6d.)

This is the first part of the proposed "Bijdragen tot eene Nederlandsche Bibliographie" to be published under the supervision of a committee (consisting of Dr. Campbell, A. C. Kruseman, S. Muller the younger, Martinus Nijhoff, F. Adama van Scheltema, and the present compiler) for administration of a special fund, designed by Frederik Muller, the well-known Amsterdam bibliophile, to be employed in the furtherance of a knowledge of the scientific and literary labours of the Dutch, especially in connection with the Netherlands and Dutch Colonies, and by aid of which various important papers, &c., have already been issued. The present volume contains alphabetically arranged accounts of the works of Dutch geographers, ethnologists, and travellers, with a geographical index for facility of reference; and is marked by the accuracy and completeness for which Mr. Tiele's work has always been conspicuous.

NEW MAPS.

(By J. COLES, *Map Curator* R.G.S.)

EUROPE.

Haddington and Berwick.—Counties of— Reduced from the Ordnance Survey, by J. Bartholomew, F.R.G.S. Scale 1:127,020 or 1·74 geographical miles to an inch. A. & C. Black, Edinburgh. Price 2s. 6d. coloured; 3s. 6d. mounted on cloth.

Italia.—Carta d' —. Scales 1:50,000 or 1·4 inches to a geographical mile, and 1:25,000 or 2·9 inches to a geographical mile. Istituto Topografico Militare, Firenze, 1884. Sheets: 42—I. N.E., S.E., S.O., N.O. 44—I. N.E., S.E., S.O., N.O.; II. N.E., S.E., S.O., N.O.; IV. N.E., S.E., S.O., N.O. 58—I. N.E., S.E., S.O., N.O.; IV. S.E., S.O. 106—III. N.E., S.E., S.O., N.O.; IV. S.E. 111—II. 112—II., III. 113—I., II., III., IV. 119—I., II., III., IV. 120—I., II., III., IV. 126—IV. N.O. 127—I., II., IV. 128—I., II., III., IV. 129—I., II., III., IV. 135—I., II., III., IV. 136—I., II., III., IV. 142—III. Price 7d. each sheet. (*Dulau*.)

ORDNANCE SURVEY MAPS.

Publications issued from 1st to 31st March, 1884.

1-inch—General Map:—

SCOTLAND: Sheet 107 (hill-shaded); 1s. 6d.

6-inch—County Maps:—

ENGLAND AND WALES: **Bedfordshire** (part of): Quarter sheets, 11 S.E.; 21 N.E.; 22 S.W.; 1s. each. **Cornwall** (part of): Quarter sheets, 10 N.W., 10 N.E., 10 S.W., 10 S.E.; 11 N.E., 11 S.E.; 16 S.W.; 1s. each. **Derbyshire** (part of): Quarter sheets. With Contours: 27 N.E. with 5 N.E. (Staffordshire), 27 S.E. with 5 S.E. (Staffordshire); 28 N.W., 28 N.E., 28 S.W., 28 S.E.; 29 N.W., 29 N.E., 29 S.E.; 30 N.W., 30 S.W., 30 S.E.; 38 N.E., 38 S.W. with 15 S.W. (Staffordshire), 38 S.E.; 43 N.E.; 57 S.W. with 41 S.W. (Staffordshire). Without Contours: 27 N.W. with 5 N.W. (Staffordshire); 31 S.W. with 22 S.W. (Nottinghamshire); 33 N.W., 33 S.W., 33 S.E.; 34 N.W., 34 S.W., 34 S.E.; 35 N.W., 35 N.E., 35 S.W., 35 S.E.; 39 N.W., 39 N.E.; 40 N.E. with 32A N.E. (Nottinghamshire), 40 S.E.; 51 S.W. with 41 S.W. (Nottinghamshire); 57A S.E. with 40 S.E. (Staffordshire); 59 S.W. with 47 S.W. (Staffordshire); 1s. each. **Devonshire** (part of): Quarter sheets, 61 N.E.; 74 N.E.; 85 N.E.; 105 N.E., 105 S.E.; 106 N.E.; 1s. each. **Glamorganshire** (part of): Sheets 14, 23; 2s. 6d. each. 21, 21A, 22A, 32; 2s. each. **Gloucestershire** (part of): Quarter sheets, 11 S.W. with 54 S.W. (Worcestershire) 11 S.E. with 54 S.E. (Worcestershire); 33 S.W., 33 S.E.; 1s. each. **Hertfordshire** (part of): Sheets 22, 39; 2s. 6d. each. Sheet 15 with parts of shts. 13, 14, 22, 23 (co. Essex); 2s. 6d. 33 with parts of shts. 35, 39 (Buckinghamshire); 2s. 6d. 38 with parts of 39, 43 (Buckinghamshire); 2s. 6d. **Leicestershire** (part of): Quarter sheets, 1 S.E. with 40 S.E. (Nottinghamshire); 2 N.E. with 44 N.E. (Nottinghamshire), 2 S.W., 2 S.E. with 44 S.E. (Nottinghamshire); 3 N.W., 3 S.W.; 5 S.E. with 45 S.E. (Nottinghamshire) and 56 S.E. (Derbyshire); 6 N.E. with 47 N.E. (Nottinghamshire); 10 N.W. with 49 N.W. (Nottinghamshire), 10 N.E. with 49 N.E. (Nottinghamshire), 10 S.W., 10 S.E. with 49 S.E. (Nottinghamshire); 11 S.E. with 50 S.E. (Nottinghamshire); 18 N.E.; 24 N.E., 24 S.E.; 1s. each. **Norfolk** (part of): Quarter sheets, 58 N.W., 58 S.W.; 82 N.E.; 91 N.E.; 92 N.W., 92 N.E.; 96 N.E.; 97 N.W., 97 N.E., 97 S.E.; 99 S.W. with 9 S.W. (Suffolk), 99 S.E. with 9 S.E. (Suffolk); 104 N.W., 104 N.E., 104 S.E.; 105 N.W., 105 S.W.; 1s. each. **Northamptonshire** (part of): Quarter sheets, 49 N.W. with 47 S.W. (Warwickshire), 49 N.E. with 47 N.E. (Warwickshire), 49 S.W., 49 S.E.; 50 N.W., 50 N.E., 50 S.E.; 54 N.W., 54 N.E., 54 S.W., 54 S.E.; 55 N.W., 55 N.E., 55 S.E.; 58 N.W.; 59 S.E.; 62 S.E.; 1s. each. **Oxfordshire** (part of): Sheet 37 with sh. 4 (Berkshire); 2s. 6d. 50 with 45 (Buckinghamshire); 2s. 6d. **Shropshire** (part of): Quarter sheets, 1 S.E.; 5 N.E.; 43 S.W.; 72 S.E.; 1s. each. **Suffolk** (part of): Quarter sheets, 9 S.E. with 99 S.E. (co. Norfolk); 17 N.E.; 23 N.W., 23 S.E.; 27 N.W.; 43 N.E.; 58 S.E.; 1s. each. **Worcestershire** (part of): Quarter sheets, 20 S.W., 20 S.E.; 21 S.W., 21 S.E.; 22 S.E.; 23 S.W.; 29 N.E.; 50 N.W. with 7 N.W. (Gloucestershire), 50 N.E. with 7 N.E. (Gloucestershire), 50 S.W. with 7 S.W. (Gloucestershire), 50 S.E. with 7 S.E. (Gloucestershire); 54 N.E. with 11 N.E. (Gloucestershire); 1s. each.

IRELAND: **Meath** (revised), Sheets 12, 15, 34.

25-inch—Parish Maps:—

ENGLAND: **Gloucester**: Aldworth, 10 sheets. Bulley, 5. Moreton, Valence, and Do. (Det., No. 1), Standish (Det., Nos. 1 to 7), and Common Lands, 4 and Ar. Bk.; Nympsfield, 5 and Ar. Bk.; Upleadon, 6 sh.; Wheatenhurst and Do. (Det.), 7 and Ar. Bk. **Leicester**: Cole Orton, 7 and Ar. Bk.; Heather, 6. **Norfolk**: Drayton, 7; Griston, 7; Hockham, 9; Larling, 7; Westfield, 3 and Ar. Bk. **Stafford**: Lapley, 8. **Suffolk**: Blaxhall, 8; Cransford, 5. **Worcester**: Clent, 10; Cradley, 4; Lutley, 4.

Town Plans:—

ENGLAND: Bristol (1:500), 79 sheets.

IRELAND: Belfast (5-ft. scale), 4 sheets (revised).

Publications issued from 1st to 30th April, 1884.

1-inch—General Map:—

IRELAND: Sheet 174 (with hills); 1s.

6-inch—County Maps:—

ENGLAND AND WALES: **Glamorgan** (part of): Sheets 9, 17, 24, 31 2s. 6d. each. **Bedfordshire** (part of): Quarter sheets, 7 N.W., 7 S.W., 7 S.E.; 8 S.W.; 17 S.W.; 1s. each. **Cornwall** (part of): 5 S.W., 5 S.E.; 6 N.W., 6 S.W.; 7 S.E.; 8 S.W., 8 S.E.; 12 S.E.; 14 S.W.; 22 S.E.; 1s. each. **Derbyshire** (part of). With Contours: 30 N.E.; 37 N.E. with 14 N.E. (Staffordshire); 57 N.W. with 41 N.W. (Staffordshire); 1s. each. **Devonshire** (part of): 49 S.E.; 61 N.W.; 62 S.E.; 75 N.W., 75 S.W.; 88 N.W.; 112 S.W.; 1s. each. **Gloucestershire** (part of): 7 N.W. with 50 N.W. (Worcestershire), 7 N.E. with 50 N.E. (Worcestershire), 7 S.W. with 50 S.W. (Worcestershire), 7 S.E. with 50 S.E. (Worcestershire); 8 N.W. with 53 N.W. (Warwickshire); 12 N.W. with 55 N.W. (Worcestershire), 12 S.E. with 55 S.E. (Worcestershire); 13 N.W. with 56 N.W. (Worcestershire), 13 N.E. with 56 N.E. (Worcestershire), 13 S.W.; 16 N.E., 16 S.E.; 18 N.W. with 60 N.W. (Worcestershire); 19 N.W., 19 N.E., 19 S.E.; 20 S.W.; 21 N.W. with 61 N.W. (Worcestershire), 21 S.E.; 30 S.E.; 31 N.E.; 32 N.W.; 36 N.E., 36 S.E.; 38 N.E., 38 S.E.; 39 N.E., 39 S.E.; 1s. each. **Leicestershire** (part of): 6 S.E. with 47 S.E. (Nottinghamshire); 12 N.E. with 51 N.E. (Nottinghamshire), 12 S.W. with 51 S.W. (Nottinghamshire), 12 S.E. with 51 S.E. (Nottinghamshire); 17 N.W.; 18 S.E.; 1s. each. **Norfolk** (part of): 47 N.E., 47 S.E.; 59 S.E.; 72 N.W.; 84 N.E.; 100 N.W. with 10 N.W. (Suffolk); 103 S.E. with 14 S.E. (Suffolk); 106 N.W., 106 N.E.; 1s. each. **Northamptonshire** (part of): 50 S.W.; 51 S.W., 51 S.E.; 58 N.E.; 62 S.W.; 1s. each. **Shropshire** (part of): 5 S.W.; 6 S.W.; 7 S.E.; 11 N.E.; 61 S.E. with 44 S.E. (Montgomeryshire); 73 N.W.; 75 N.E.; 76 N.E., 76 S.W., 76 S.E.; 79 N.E.; 1s. each. **Staffordshire** (part of): 5 N.W. with 27 N.W. (Derbyshire); 5 S.E. with 27 S.E. (Derbyshire); 14 S.E. with 37 S.E. (Derbyshire); 40 N.W., 40 N.E. with 57 N.E. (Derbyshire), 40 S.E. with 57 N.E. (Derbyshire); 43 S.W.; 50 S.E.; 56 N.E.; 61 S.W., 61 S.E., 64 N.W. with 4 N.W. (Warwickshire); 65 N.E. with 5 N.E. (Warwickshire), 66 N.W., 66 N.E.; 73 S.E. with 7 S.E. (Worcestershire); 1s. each. **Suffolk** (part of): 4 S.W. with 90 S.W. (Norfolk); 9 S.W. with 99 S.W. (Norfolk); 10 S.W. with 100 S.W. (Norfolk); 38 N.W.; 45 N.W., 45 N.E., 45 S.E.; 49 N.W.; 50 N.W.; 57 S.E.; 58 N.W., 58 N.E., 58 S.W.; 1s. each. **Worcestershire** (part of): 8 S.E.; 13 N.W., 13 S.W., 13 S.E.; 16 S.W.; 20 N.W., 20 N.E.; 27 N.W.; 43 N.W. with 49 N.W. (Warwickshire) and 3 N.W. (Gloucestershire); 1s. each.

IRELAND: Meath (revised), Sheets 11, 18, 22.

25-inch—Parish Maps:—

ENGLAND: **Bedford:** Cople 9 sheets; Sandy 10. **Cornwall:** Advent 11; Altarnun 27; Lanteglos 13; Linkinhorne 18; St. Clether 8; St. Dominick 10; South Hill 10; St. Ive, Ar. Bk. **Gloucester:** Bibury 15; Coaley and Do. (Det. No. 2) 9; Colesborne 8; Coln St. Dennis 10; Driffeld 4; Dymock 15; Eastington and Do. (Det. Nos. 6 and 7) 7; Frocester 6; Harnhill 4 and Ar. Bk.; Newent 19. **Nottingham:** Basford, Ar. Bk. **Shropshire:** Astley Abbots, Ar. Bk.; Easthope, Ar. Bk.; Upton Cressett 7. **Stafford:** Bobbington 8; Rolleston 14; Tatenhill 20; Tutbury 12; Yoxall and Do. (Det.) 14 and Ar. Bk. **Suffolk:** Knoddishall 5.

Town Plan—5-feet scale:—

IRELAND: Belfast (revised). Sheets 35, 48, 49, 60.

ASIA.

Jerusalem.—Plans, Elevations, Sections, &c., showing the results of the Excavations at Jerusalem, 1867-70. Executed for the Committee of the

Palestine Exploration Fund, by Captn. Charles Warren, R.E., assisted by Serjeant H. Birtles, Corporals R. Turner, C. Ellis, J. Duncan, D. Mackenzie, J. A. Hanson, and J. Cock. 50 Plates in portfolio. Palestine Exploration Fund, London, 1884.

The following is a list of the plans and maps:—Plate No. 1, Title and Table of Contents; 2 & 3, Plan of Jerusalem showing Rock contours 1:2500; 4 & 5, Masjed al Aksa, or Haram Ash Sharif, showing the results of the Excavations 1:1000; 6 & 7, Haram Ash Sharif (The Noble Sanctuary), showing Rock contours 1:1000; 8 & 9, Sections on Plates II. and III. 1:2500; 10, 11 & 12, Sections on Plates IV. and V. 1:1000; 13, Elevation of North-East Angle 1:120; 14, Elevation of North-East Angle 1:60; 15, Sections at North-East Angle 1:60; 16, Birket Israil 1:120 and 1:500; 17, Details near North-East Angle; 18, Elevation, South-East Angle, East Angle 1:60; 19, Elevation, South-East Angle, East side, 1:120; 20, Elevation, South-East Angle, South side 1:120; 21, 22, 23, Painted Marks on East Wall, full size; 24, Single Gate and Ophel Wall; 25, The Triple Gate and Double Tunnel; 26, Elevation of South Front 1:500; 27, South-West Angle, South side, 1:120; 28, South-West Angle, West side 1:120; 29, Section through Robinson's Arch 1:60; 30, Plan of Aqueduct, Robinson's Arch 1:120; 31, Passage at Barclay's Gate 1:120; 32, Elevation of Barclay's Gate, 1:120; 33, Section through Causeway Vaults and Wilson's Arch 1:120; 34, Elevation of West Wall at Causeway 1:120; 35, Plan of Secret Passage and Causeway 1:240; 36, Plan of Great Causeway 1:240; 37, The Twin Tunnel near North-West Angle 1:500; 38, Sections, South and West Fronts 1:60; 39, Substructures, Noble Sanctuary 1:240; 40, The Wall of Ophel 1:120 and 1:500; 41, Details about the City 1:120; 42, Aqueduct, Virgin's Fountain 1:1000; 43, Passage, Virgin's Fountain 1:240; 44, 45, 46, 47, Pottery found in the Excavations; 48, Reconnaissance of Philistia; 49, Reconnaissance of Jordan Valley; 50, Plan and Sections of the Muristan (by Captn. Conder, R.E.).

AFRICA.

Central Africa.—Route der Pogge-Wissmann'schen Expedition von Malanshe bis zum Tanganika-See. Juni-August 1882. Aufgenommen von Lieut. Wissmann. Construiert und herausgegeben von Richard Kiepert. Scale 1:750,000 or 10³ geographical miles to an inch. Blatt III. Von Mutschimang bis Bene Tanganika. Blatt IV. Von Bene Tanganika bis zum Tanganika-See. 'Mittheil. der Afrikanischen Gesellschaft in Deutschland,' Bd. IV. Taf. 7 & 8. D. Reimer, Berlin, 1884. (*Dulau.*)

Sheets I. and II. of this map have been noticed in the R. G. S. 'Proceedings' for April of this year, and the present issue is quite in keeping with those previously published. The amount of topographical work done during this journey is astonishing; all principal features of the country for about eight geographical miles on either side of the route have been sketched in, the positions in latitude and longitude fixed, the heights of nearly all the halting places and some of the hills determined, and the error of the compass observed. The remark made on a previous occasion with reference to the two sheets of this map then issued, applies to those now published, that there are few route surveys made under similar circumstances in which anything like the same amount of topographical detail is given. Sheet III. extends from Mutschimang in lat. 6° 30' S., and long. 21° 35' E. to lat. 5° 45' S. and long. 25° 38' E., and Sheet IV. from the latter position to the shores of Lake Tanganyika.

Guinée.—Carte des Possessions Anglaises et Françaises sur le Golfe de—. Gravé par R. Hausermann sous la direction du Vte. Ch. de Bouthillier. Paris, 1884. Scale 1:4,600,000 or 63 geographical miles to an inch. *Dulau.*

Ogôoué et du Congo.—Carte de l'—, pour suivre les voyages de Mr. de Brazza. Dressé par J. Hansen, Dessinateur de la Société de Géographie. Paris, 1883. Scale 1:2,000,000 or 27 geographical miles to an inch. *Dulau.*

Zaire.—Carta do Curso do Rio— de Stanley-Pool ao Oceano. Coordenada por Capello e Ivens, 1883. Commissao de Cartographia junto do Ministerio da Marinha e Ultramar. Scale 1:410,000 or 5·6 geographical miles to an inch. Gravée et imprimée par Erhard, Paris. Two sheets. (*Dulau.*)

This is a very neatly executed map and contains a large amount of detail with regard to the country of the Lower Congo. On comparing it, however, with the map lately published by the *Société Anonyme*, under the direction of Dr. Joseph Chavanne, very serious discrepancies present themselves; for instance, the river from its mouth to Boma does not at all agree as laid down in these two maps, the small creeks in the Portuguese map being represented as broad channels in Chavanne's. Nearly every important position on the present map differs both in longitude and latitude from that assigned to it by Dr. Chavanne, and the river is made to pass the 5th parallel of S. latitude in longitude 14° 38' E. on the Portuguese map, and in longitude 14° 50' E. by Dr. Chavanne. The configuration of the hills and even of Stanley Pool itself differs much more widely in these two maps than would be expected, when it is remembered that one is the work of Portuguese Government Surveyors, and that the other has been compiled by a well-known geographer, who is reported to have visited the Congo Region for the special purpose of gathering reliable information.

CHARTS.

Admiralty.—Charts and Plans published by the Hydrographic Department, Admiralty, in May and June 1884.

No.	Inches.		
52	m = 6·6	Ireland, east coast:—Wicklow roadstead and harbour.	Price 6d.
2001	m = 5·0	South America, east coast:—Montevideo bay.	Price 1s. 6d.
1331	m = 0·9	South America, east coast:—Port Belgrano.	Price 2s.
626	m = 2·0	Japan:—Naka Koshiki and Tatsu Maru. Aburatsu harbour.	Price 1s.
1185	m = 2·7	England, River Thames:—Sea reach.	Price 2s. 6d.
863	d = 2·0	North America, east coast:—Hudson bay and strait.	Price 3s.
292 Plan added, Femme harbour.			
(J. D. Potter, agent.)			

CHARTS CANCELLED.

No.	Cancelled by	No.
52 Wicklow roadstead	{ New plan, Wicklow roadstead and harbour	52
2001 Montevideo bay	{ New plan, Montevideo bay	2001
1331 Port Belgrano	{ New plan, Port Belgrano	1331
1118 Shetland Isles	{ New charts, Shetland Isles, 2 sheets	1118a,b
1185 Sea Reach	{ New plan, Sea Reach	1185

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No. 2252. Baltic sea:—Gulf of Bothnia. 2299. Baltic sea:—Hornsland to Stierno point. 2241. Baltic sea:—Entrance to gulf of Finland. 780. Pacific ocean:—S.W. sheet. 2230. Black sea:—Bosporus to Cape Kaliakara. 159. South America, west coast:—Puerto del Morro. Cockle cove and approaches. 196. Baltic sea:—Nidingen to Hönö. 2346. Baltic sea:—Winga sound. 2229. Baltic sea:—Entrance to Great and Little Belts. 2246. Baltic sea:—Baltic port to Hogland.

2224. Baltic sea:—Helsingfors, Sveaborg, and parts adjacent. 2296. Baltic sea:—South Quarken to Hornsland. 2297. Baltic sea:—Hango head to South Quarken. 2360. Baltic sea:—Cape Falsterbö to Kalmar sound. 2329. Norway, east coast:—Sando to Svenöer. 23. South America, west coast:—Channels between Magellan strait and gulf of Trinidad. 24. South America, west coast:—Channels between the gulf of Trinidad and gulf of Penas. 650. Africa, east coast:—Kilimani or Quillimane river. 2114. Baltic sea:—The Kattegat. 2325. Baltic sea:—Limfjord. 850. North sea:—Nordzee or Ymuiden harbour. 545. Magellan strait, Royal road and Elizabeth island. 1749. Brazil:—Monte Video to Buenos Ayres. 2865. Africa, east coast:—Mouths of the Zambesi. 124. North sea:—T'axel. 2322. North sea:—Scheveningen to Ameland. 893. Newfoundland:—Burni harbour to Devil bay. 1380. South Pacific ocean:—New Caledonia, New Hebrides, and Loyalty islands. 631. South America, west coast:—Smyth Channel. 1019. China:—Yulin-Kan bay, &c. 2362. Baltic sea:—Landsört to Bothnia gulf. (*J. D. Potter, agent.*)

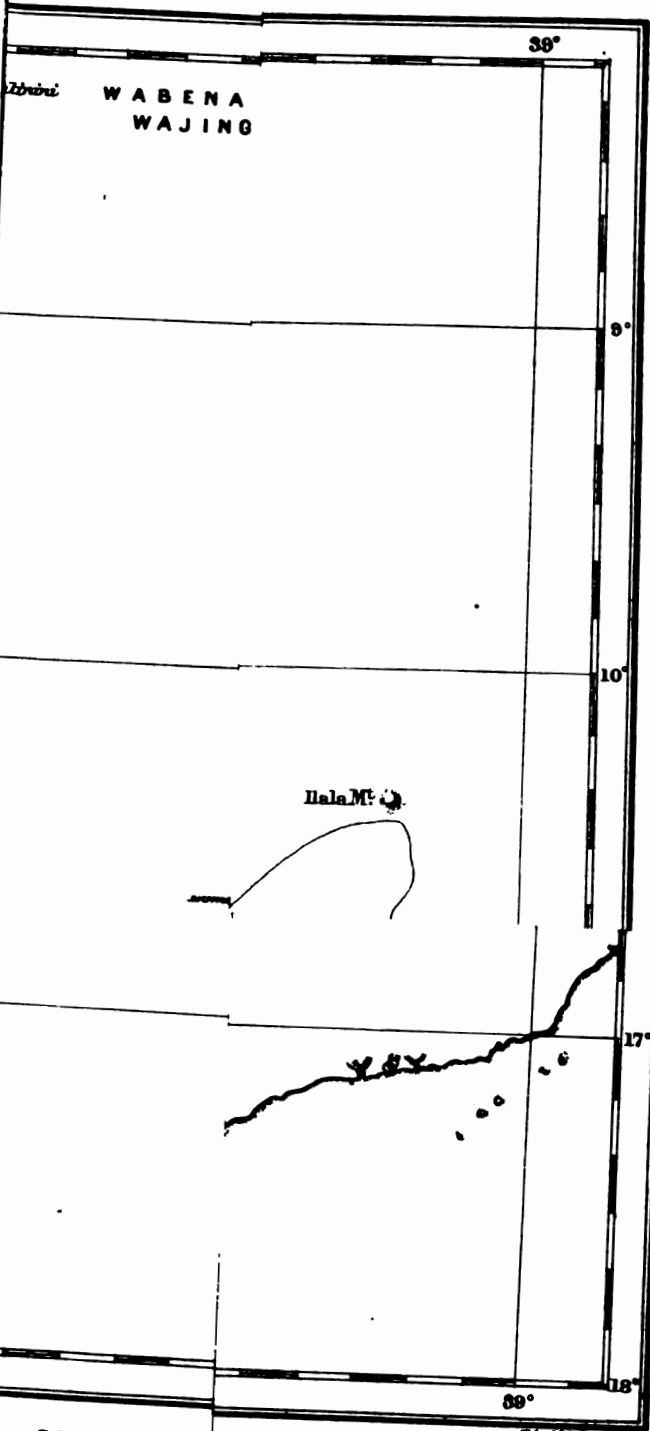
North Atlantic Ocean.—Meteorological Charts of the——, for the months of March, April, May, June, July, August, and September. Giving true direction and mean force of the Wind, Calms, Variables, Rain, Fog, moderate and heavy Squalls and Gales, Mean of Barometer, Temperature of the Air, Wet-Bulb and Water, and their mean daily ranges. Compiled from data collected by U.S. Hydrographic Office, embracing Maury's pilot charts, and from British meteorological charts. Published at the Hydrographic Office, Washington D.C., 1884. J. R. Bartlett, Commander U.S.N., Hydrographer to the Bureau of Navigation. Price 2s. 1d. each sheet.

—— Pilot Chart of the——. No. 8, July 1884. Equatorial scale 3·7 degrees to an inch. Prepared by order of the Bureau of Navigation. Commander J. R. Bartlett, U.S.N., Hydrographer. U.S. Hydrographic Office, Washington D.C.

EDUCATIONAL.

United States and Mexico.—Map of ——, constructed and engraved by W. and A. K. Johnston. Edinburgh and London. Scale 1:2,914,560 or 40 geographical miles to an inch. 1884. Price, on cloth and roller, varnished, 1l. 1s.

This is one of a series of maps published by W. and A. K. Johnston, to meet the requirements of large class-rooms, which necessitate the maps being drawn on a larger scale in order that the detail may be seen at a considerable distance. Messrs. Johnston have named them the "Imperial Series." The map is clearly drawn, and the physical features are well shown.





PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

A Journey from Mombasa to Mounts Ndara and Kasigao.
By Commander C. E. GISSING, R.N., Vice-Consul, Mombasa.*

Map, p. 614.

ON the 27th of May I left Mombasa, and sailed in my boat to the Banderini, or landing-place, on the Rabai Creek; having previously made arrangements I was able to leave on the following day, accompanied by my staff and twenty-three porters; it was necessary to have a large number of porters, as all the food for the party had to be carried, there being none obtainable on the way. When leaving the landing-place rain was falling heavily, and continued to do so till we were over the Rabai Hills, which here rise to a height of 1200 feet, stretching along parallel to the coast, and about 12 miles from it; we stopped at a small market village called Kisimani to adjust burdens, and here the men cooked their first meal. I call it a market village because no one lives in it, but the Wa-nika bring their produce here to sell, and make a market of the spot; the place itself consists of a few grass huts; after remaining a couple of hours, we started for Mwache. I found the land beyond the Rabai Hills dips a little; the country is at this time of the year exceedingly pretty, the hills being covered with beautiful grass; here and there small clumps of trees aid in giving it a park-like appearance; it is altogether an excellent place for game, of which I saw a good deal, shooting a fine buck.

We camped the first night a short distance from a place called Mwache; the country here is 348 feet only above sea-level. Mwache was a year ago a village inhabited by the Wa-duruma tribe; it forms the boundary between that tribe and the Wa-nika tribe, who live mostly about the Rabai Hills. The Wa-duruma have been driven out of Mwache by the Masai, a pastoral tribe in the interior, who come to the coast after the cattle, killing every one they meet on the way. They have

* The paper is a Report (with slight abridgment) addressed to Sir John Kirk, and communicated to us by the Foreign Office. The map is a reduction from the original sent to us direct (with his astronomical and other observations) by Commander Gissing.

simply deprived this part of Africa of all cattle; the natives here are afraid to keep any, as, if they do, it is sure to bring these savages upon them; the Masai never spare any man, woman, or child that they meet with on the road, or in any place they attack. All along the route were deserted villages and *shambas*, or cultivated patches, the inhabitants having been killed off by these marauders. Mwache is quite deserted, nothing marks the spot but a few coco-nut trees and two or three mango trees that have escaped the general destruction. What makes the place important is that a mountain stream runs through it, called the Mwache river; it is the meeting-place of several small streams from the neighbouring hills, that here join into one main stream, emptying itself eventually into the sea at the north-west corner of Port Reitz, or, as it is known here, Duruma Creek; the bed of the river is quite dry a few days after rain has fallen, but at one place the rocks (sandstone) have become worn to a depth of seven or eight feet, and the water remaining in these holes being well sheltered from the sun by overhanging trees, is drinkable for months after the stream has ceased running; the water is, from a European point of view, very bad indeed; when I was first there it had been lying in the rocks about three weeks, and the second time I visited the spot it had been there about six weeks; it was of a dark brown colour, and full of animal and vegetable life; it is only with an African thirst that one could tackle such stuff; my porters drank freely of it; I took the precaution to boil mine, and suffered no ill effects.

After leaving Mwache the road winds through woods and valleys in a pretty undulating country, with plenty of game, and occasionally a pool of muddy water, rain having recently fallen in some places. The road, as I have called it, is merely a footpath, where two people could not walk abreast; it is also much obstructed with thorny trees, which, meeting overhead, give great trouble to the porters carrying their burdens. I was constantly feeling a tug at my head, and finding some thorny branch swinging in the wind had hooked off my hat. I never in all my life saw anything like the thorns here; every tree and bush has them; some of the bushes had spikes nearly four inches long all over them. My porters, knowing the road, had each brought a piece of hide, which, with the help of a knife, they soon turned into a very excellent sandal to protect their feet from the spikes. After passing through the thorny part of the road we came on many ruined *shambas*, and occasionally met a M-duruma, who had always the same tale to tell—he was very hungry, had nothing to eat, the Masai had destroyed everything, &c. We saw several Masai paths; they are always at right angles to the main road; they never travel except by their own paths for obvious reasons. They had been camping at one place for three days before we arrived.

About six miles before arriving at Gorah the country opens out into

most beautiful glades, where I obtained excellent sport. The next day we went on, arriving at Gorah about noon, where we expected to find plenty of water, as we had been assured we should, but there was not a drop. At this place there are wells, the only wells I have seen except those near and in Mombasa, which were made by the Portuguese hundreds of years ago. The wells at Gorah, or rather ponds, are four in number; they are dug out of the clayey soil at the foot of the hills to a depth of about 15 feet; when rain falls the water from the hills fills them and remains in them for about six weeks; when I arrived there they were quite dry. Here the immense difference between the climate of the coast and the interior first becomes apparent. The land between Gorah and the coast is undulating, wooded, grassy, and fertile, but when you leave the hills and descend to the plain you leave the fertility behind you; here everything was dried up, evidently no rain had fallen for a long time, for the grass was withered, the trees leafless. There was no use sitting by the empty wells, so we went forward to find water; on our left was a stretch of forest for about two miles, hidden away in which are the villages of the Wa-duruma, several of whom were standing at the entrance to their village, which was well stockaded. They were all armed with the bow and poisoned arrows that all natives of this part of Africa except the Masai carry, the latter being always armed with spear, shield, and sword. The Wa-duruma are very like the Wa-nika in appearance; both men and women wear large quantities of brass wire wound round their arms and legs, also blue and pink beads round the neck; the only clothing is a cloth round the waist, which in the case of the women is ornamented with beads; the body is covered with a mixture of castor-oil and red clay; they generally shave all the hair off their heads, and pluck all other hair out of the body. Their houses are exactly like small hay-ricks; the door is simply a hole about three feet high, with a piece of hide hung before it; the inside smells like a wild beast's den. It was here that I met Mr. Thomson, the African traveller, returning to the coast after his visit to the Masai country.

After leaving the forest the road passes through many miles of plantations of the people of Gorah: they were quite dry when I saw them; a few people in the hollows were growing a little mahindi, or Indian corn, and millet seed; also some beans were struggling to come up, but on the whole they looked very poor, and the people we met looked thin, and complained much of hunger. I obtained a guide, who promised to take us to a place where there was water, which he did; the place is called Mfufuni; we arrived here about seven P.M., after a long and hot march, and though the water was certainly unfit to drink, we all drank largely of it. The place was formed by the rocks (sandstone) cropping up above the soil some six feet, for about two acres, and inclining downwards to a central place where the soft sandstone had become worn into a deep hole about 16 feet deep, with a width of about eight feet and a length of 20 feet. These places

are most important on this route, as there are no rivers, no wells, and no other places whatever for water. It is very curious to see the beds of sandstone worn into quite a number of perfectly circular holes, about two to six feet diameter, and varying in depth from two to 12 feet; these holes fill during rain, and the water remains for three or four months. They are the natural wells of the country, and without them it would be quite impassable.

Next morning we started for a place called Taru, where water was to be obtained, and where the first hills of Teita are met with; it is the boundary between the Wa-duruma and the Wa-teita tribes. We could occasionally see the hills of Taru through the trees; the trees are mostly thorny acacias, there is very little cultivation, and very few people were met with. About two P.M. we arrived at Taru. Taru watering-place is some four miles from the two hills; it is merely a place where the rocks hold the rain-water; there is no stream or river anywhere about. A few years ago there were some villages at Taru, of a people called the Wa-langulo, a harmless hunting tribe, from the Galla country, but the Wa-kamba people from U-kambani came here, attacked them, and carried a great many away as slaves; the remainder now live in the forest entirely by hunting. They do not cultivate at all, build no houses, and live like wild animals; they are seldom seen, but they trade a little with the Daruma villages, exchanging the meat of wild animals for other food and the few wants they have.

After a short rest we left Taru, and marched some hours towards Maungu, where we camped for the night. After leaving Taru you come upon a vast plain, 925 feet above sea-level; it stretches away for 70 or 80 miles to the north and to the south; it is thinly covered with trees of the acacia family, euphorbia, and a little grass; the acacias are full of gum, but no one collects it. The travelling is very monotonous; occasionally the path leads through a wood, where the thorny trees almost meet; it is here that the porters have the worst time in travelling, as they have constantly to bend almost double to avoid the branches overhead, and their skins get terribly torn by the thorns; they suffer also from the white milk of the euphorbia stems being spurted into their eyes through the trees being broken by those marching in front; oil is the best remedy, rubbed in gently it affords quick relief.

The next morning we started again, arriving at Maungu about four P.M. The vegetation all the way is the same; the path is perfectly level, but winds excessively; like all African paths, it goes round every obstacle it meets with, and having done so time after time, it has now become literally like a corkscrew; the reason is, people who use the path are almost always carrying burdens, and when a man is carrying 60 lbs. on his head on a hot day he is not likely to put it down for half an hour to clear a thorny tree out of his path when he can walk round it and leave it behind him; the rest follow after, till at last the

windings become perfectly wonderful, and you sometimes find yourself actually going away from the place you wish to reach. There is water sometimes between Taru and Maungu at a place called Ziwani, but only a week or two after rain has fallen; when I passed it on both occasions it was perfectly dry.

We camped for the night about 500 feet up the mountain, and the next morning started for Mount Ndara. The plain between the two mountains is partly limestone and partly a red earth, I should think containing iron; the mountain itself is granite, with some sandstone; there are veins of quartz running through the granite, containing a good deal of mica. Towards midday we approached the mountain, which attains a height of 4800 feet above sea-level; it is a magnificent granite mass, about 10 miles long, rising steeply out of the plain; the top is the home of the Wa-teita, who cultivate the plain at the foot, the soil of which is very red and, in places, contains a large percentage of salt. The natives eat it just as it is, putting the earth into their food; they are far too lazy to try and extract the salt. We climbed the face of the mountain by a steep valley on the south side; it was stiff work after a long walk; the sun was very hot, but we went up till, when near the summit, we came to a clear cold spring of pure water, issuing out from under a huge cliff; it was a tiny little spring, and did not go many hundred feet down the mountain before it was entirely lost in the universal dryness, but we had the full benefit of it, and I confess I never enjoyed anything more in my life than that long drink of cool fresh water. It was no use trying to go on; the porters threw down their burdens and drank till I really thought they would burst.

After refreshing ourselves we went on to the ridge and walked round to the house of Mr. Wray, of the Church Mission Society, who welcomed the party most kindly. Dotted all over the summit of the hill were the villages of the Wa-teita; their houses are round, with a circular roof, just a circle of sticks stuck in the ground and plastered with mud; the roof is of grass, and the door about three feet high, closed with a piece of hide.

These people come from the Mangea Mountain in Giriama; the men are rather under the average of tribes in this neighbourhood as to build and strength. They are laziness personified; the women do all the work that is done; the only piece of useful work the men do is to mind the cattle and goats. They attack all caravans passing below on the plain. They are a band of hill robbers, sitting on their mountain like so many hawks, or barons of old, watching for any weak party coming near their mountain. Mr. Wray on one occasion saw them go down and attack a large caravan of Wa-kamba people who were camped below; the Wa-teita killed some twenty of the Wa-kamba, the rest of whom ran away, leaving the cattle in the hands

of the Wa-teita. Mr. Wray counted the cattle when brought up the hill; 226 head of cattle fell into their hands on that occasion. They are armed with bows and poisoned arrows; a few have Masai spears; they live in constant dread of attacks from the Masai, who come to the mountain, take all the cattle, and kill every one they can lay their hands on; a great part of the cultivatable land is left wild, so that they may have a place to run to when the Masai come. They have fought them on more than one occasion, but were totally defeated, and now, like all other tribes of these parts, the very name of the Masai is enough to frighten them. They are an exceedingly dirty people in their persons. They shave all the head, but leave a tuft on the back of it. They ornament their bodies by brass wire wound round the arms of both men and women. The men wear beads round their necks, and in their ears large loops of beads; the women are naked, except a loin-cloth, which is ornamented with beads. They wear a heavy collar of blue beads round the neck, weighing three or four lbs. They are very plain, but much more intelligent and active than the men. On them falls all the work; they descend the mountain every day to the shamba at the foot, where they cultivate Indian corn, millet, beans, tobacco, gourds, &c. They have to go into the forest to collect firewood; all this has to be carried up to the village at the top, some 4000 feet up. It is wonderful what loads these women will carry; the men cannot do it. They seem happy enough with it all. It is a common sight about here to see a man going along with his bow and arrow, followed by his wife carrying a heavy bag of food, cooking-pot, water, and all sorts of things. A friend of mine once expostulated with some natives about this custom, but the ladies took up the cudgels for their husbands, and said it was their place to carry the things, and that they would not allow their husbands to carry anything; so you see there are women's rights here as well as at home.

The Wa-teita have no chiefs, no laws; they have a few customs; they are exceedingly superstitious; the rain-maker is a great personage amongst them. While I was there it was a time of great drought; no rain had fallen, as it should have done, early in June, and consequently the shambas were bare; the rain-maker had said that the presence of Mr. Wray was the reason why there was no rain, and many were the hints that gentleman got that if he moved off the rain would come. A few hours after my arrival, whilst sitting outside the little iron house in which he lives, a great council was going on; natives from all the villages on the mountain were taking part in it. At last a deputation approached, when a solemn palaver took place, and the following was the request they had to make: the cause why the rain did not come was because when he, Mr. Wray, had come to the mountain, some two years before, he had given some cloth to one of the elders, which cloth was afterwards stolen from that elder by his son-in-law, and unless Mr. Wray gave that elder some more cloth the rain would not come; this

was the result of some hours' deliberation ; it is unnecessary to say the request was politely declined.

A short time ago an M-hindi, named Ali, from Jomvu, came to the mountain for water, having some slaves with him ; he did not wish Mr. Wray to know about his having the slaves, so he applied to the medicine man for a medicine to prevent Mr. Wray finding it out. After a good deal of deliberation it was decided what the medicine should be, but the thing was how to get Mr. Wray to eat it, that was, to bell the cat. However a plan was at last decided upon ; the medicine was to be given to a cow, the cow was to be killed, and some of the meat offered to Mr. Wray ; this was done, and Mr. Wray, somewhat surprised at the unusual generosity of the people, accepted it and ate it, but also afterwards he found the slaves, reported the case, Ali was tried, and the *mganga*, or medicine man, has lost his reputation he wanders about the mountain now a sadder and wiser man, fully convinced that cow somehow sold him, as he knows the medicine was all right.

A Wa-teita may have as many wives as he likes, several have two, some three, and they all live in harmony together, carrying each other's babies, working and sleeping together in the most amicable way. When a man wants a wife, he selects a young girl, not for her looks so much as for her capacity to carry food and firewood up 4000 feet a day ; he then goes to her father and mother, to whom he pays the price for the girl, generally a cow and two or three goats, or, if a particularly fine girl, two head of cattle and some goats ; the girl knows nothing of all this, there is no courtship, her opinion is not asked ; after the man has bought her he sends his friends down the hill into the shambas, where they waylay the girls and women at work, and seize the one chosen ; she and her companions generally make a fight before they will allow her to be carried off, but as a rule the resistance is feeble, and the bride is hoisted on the shoulders of the young men, who carry her up the hill, and put her in the bridegroom's house, he puts on her beads, she then returns to her father and mother ; the next day she returns to her husband's house and remains as his wife ; it sometimes happens that the girl refuses to remain, in which case the price is returned, and the girl is sold to the Swahili, or to the people of some other mountain. A man here always treats his wife well, because his food and all his comforts come from her, and if he does not, she simply leaves him and goes to live with some one who will treat her well.

The people on these mountains have very few slaves, and those they have they treat very well ; any stranger they can catch is made a slave of, he is generally sold to the Swahili traders or to the people who live on a large mountain to the north-west of Ndara called Kilima-kibomu, or Big Mountain ; it is from the south side of that mountain that the river Voi takes its rise ; it flows right across the level plain to Giriama, and eventually reaches the sea in Kilifi Bay.

The high mountain called by the people here Tata is inhabited by Wa-teita, who come from a different stock from those of Ndara; they speak the same language, but with a different dialect; they bear a bad name even here in this land of thieves; the people from Ndara, who are friends with them, can only go to buy food on Kilima-kibomu by stealing up their mountain after dark or in large parties; they are often robbed and sometimes even killed by the Kibomu people. The people of Kibomu are very much opposed to the presence of a European on Ndara Mountain, and often threatened to come and drive him out; they make raids all round the neighbouring mountains, going to Pare and U-sambara, where they are feared the same as the Masai are on the coast.

They have a good many cattle and goats. Whilst I was at Ndara they brought some women for sale whom they had captured on Kasigao Mountain; curiously enough the relations of the women they brought were living themselves on Ndara; the relations subscribed and ransomed the women, they had to give two cows, six goats, and some beads to free them; women who are sold in this way remain with the man who buys them, not as his slave, but as his wife, but really there is not much difference. The people on these mountains never kill their cattle or goats for food, they only eat them if they die, unless, on some special occasion, the mganga, or medicine-man, orders one to be killed. When any one dies, they bury him at once, lamenting with loud cries, but after the body has been in the grave for some months, it is disinterred and the head cut off and put in some place where the skulls of the tribe are kept, to be consulted on special occasions by the medicine-men: the body is then finally buried.

Sugar-cane grows abundantly, both on the mountain and at the foot; bananas grow luxuriantly all over the mountain, the natives eat them before they are ripe; though there were thousands of banana trees, I never saw a ripe one while I was there, and Mr. Wray tells me he never sees them; the other products are the same as everywhere on this coast—Indian corn, millet, beans, cassava, sweet potatoes, tobacco, castor-oil plants, are the principal ones; there are some fine trees near the summit, plenty of euphorbia of different kinds; some of the trees yield a sap like indiarubber, but they are not in sufficient quantity to form an article of trade. I found the indiarubber vine growing, known here on the coast as *mbungu*; fruits there are none; I planted both mango and orange trees in a very favourable position, and Mr. Wray has undertaken to watch their growth. I also planted orange trees at the spring of water coming up the hill, and mango stones at all the watering-places on the way. They have none whatever at present, and I consider the introduction of the mango very important, as here on the coast it yields enormously twice a year, and requires no care; it enables the people to tide over times of scarcity that without it would be times of actual famine.

After spending a few days on the mountain, I went down to see Mr. H. H. Johnston, who was camped at the foot; this was on the 6th of June. Mr. Johnston had a difference with his porters as to their food, &c., which led to nineteen of them refusing to go on; the remainder went on, and he himself left in good spirits for Kilima-njaro; the burdens of the porters who refused to go forward were left in charge of Mr. Wray, who kindly consented to take care of them; Mr. Johnston intends to send a party of men to bring them on as soon as he himself arrives at Chagga.

After parting with Mr. Johnston I took the route to Kasigao, as the highest mountain in Teita is called by the natives; crossing the plain everything was dried up, animals were scarce on account of want of water, grass withered, trees leafless, nothing but thorns.

On the morning of the 7th of June we arrived at the foot of the mountain; it is a huge mass, rising almost perpendicularly out of the plain to a height of 5185 feet above sea-level; it is much steeper than Ndara; in the centre on the north side there is a valley, down which runs a small stream of very good water; at the foot of the mountain are shambas, or cultivated patches, but utterly neglected; though rain had fallen they were not even sown; I afterwards found the reason was because the people had not reaped a crop at the foot of the mountain for nine years; rain falls, the crop comes up, but no more rain falls afterwards, and the whole thing dries up; this has happened year after year, till they have now given it up. On ascending the valley to about 1000 feet above the plain I found some coco-nut trees, in apparently very good condition, one of them certainly had fruit on it; I was surprised to see them, as the mountain is about 70 miles inland as the crow flies, but there they were.

On mounting to the village, which is about 1500 feet up, I had some difficulty in finding sufficient level space to pitch my tent, the mountain is so steep; at last a place was found; also a house for my men; there was no difficulty, as most of the houses are empty, the people having gone elsewhere in search of food; the people living there are the same as those of Ndara Mountain; they demand a small hongo; I gave them about 6s. worth of cloth, and they were quite satisfied.

There is very little attempt at cultivation; I saw a few goats, and no cattle; the castor-oil plant seems to thrive everywhere, the people here use it to rub over their bodies and their loin-cloth, which latter unfolded covers their bodies at night, and the cloth being to a certain extent waterproof, keeps the dew off their skin. I certainly do admire the simplicity of the African's sleeping arrangements; on arriving at a camping-place, his first thing is to go and collect firewood, which about here is abundant; he obtains a light by rubbing the point of a piece of hard wood into another piece of hard wood by rubbing it rapidly between the palms of his hands, till fire is produced; he then cooks his

food in a little iron pot, eats it, lays a piece of hide on the ground, unrolls his loin-cloth, pulls it over his body, lies down with his back to the fire and sleeps like a log. The dew here comes down like fine rain; everything is covered in the morning, but the natives do not seem to mind it. There is one habit of theirs that seems universal amongst them, that is snuff-taking; they carry it in a small gourd hung round their necks, and whenever a halt is made out comes the stopper and about enough to fill an ordinary salt-spoon is shaken out into the palm of the hand, the head is bent down and a nostril opened—well, “right across her face it grows”—and with one tremendous sniff up it all goes; then the head is raised with a satisfied look, and my African sits perfectly still for some two or three minutes enjoying the sensation. They seldom smoke tobacco; some few do, and vile is the smoke it makes; the smell of it is very strong and rancid; I doubt very much whether the tobacco plant here produces a fine enough leaf for European use; it might do so with proper cultivation, but people here do not cultivate, they just let things grow, assisting nature does not concern them; they might have any amount of water for their shambas if they would only dam up one or two of their valleys; it could easily be done, but when the thing is pointed out to them, they only shake their heads. The sugar-cane is not grown on Kasigao; the people could give me no reason, and I verily believe it is only because they are too lazy to plant it.

The wind blows very strongly on all these mountains; after the sun goes down it blows hard, almost a gale of wind, for about two hours; the wind is from the westward by day, and from the eastward by night; it comes roaring down the gullies of the mountains as though it would tear the very rocks away; I thought my tent would have been blown off the mountain, and it would have been but for a large rock that protected it behind.

The next day I procured a guide to lead me to the summit. We started, and had some very stiff climbing till about 1000 feet from the top we came to a magnificent forest of trees; some of them were quite 60 feet high; under their shade the sun's rays do not penetrate; the air is like being in a cave, it made my porters shiver so, they begged not to go on.

Mosses and ferns are abundant. Here I found a tree whose sap resembles the guttapercha which was sent to Mombasa some months ago, and the place where it came from not found yet. I am not certain, as the specimen I obtained was afterwards lost before it had hardened and I had had an opportunity to test it; however, I have brought some young trees yielding this sap to the coast with me, and should they thrive as I hope they will, I shall be able to test it later on.

In this forest were a few monkeys, marks of wild pigs and hyenas; on these mountains the hyenas are very large and fierce, it is not safe

for any native to be out by himself at night; they are often caught and eaten. The beasts went into a house on Ndara while I was there and took out a child. A man who had been making merry with the native beer, which they make from sugar-cane, came to the mission-house in a state of intoxication; he was, of course, sent away, and told to go home, as it was getting dark and the hyenas would soon be about. He started, but, overcome with drink, lay down to sleep not far from the mission-house. Next morning there was absolutely nothing left of him but his bow and arrows, the brass wire that had been wound round his arm, and his beads.

After passing through the forest we came out on a ridge about half a mile from the summit, and about 500 feet below it. It required considerable pressure and large promises of cloth and beads to induce my party to attempt the very top. They simply could not understand what on earth I wanted to go there for. At last we started. I can assure any one that wants a bit of hard work that they will find it in climbing to the summit of Kasigao. There is no path, it is one constant climb over slippery boulders, under bushes, over fallen trees, getting hung up with thorns and covered with *siafu*, a biting ant. Twice I had to strip off everything and pick them off my body in dozens. They bit so hard that when pulled off the bodies came away, leaving the heads sticking in the skin. The slope was nearly perpendicular, but at last we came to the top, and I stood on the summit of the highest mountain in Teita. The thermometer was boiled for height, and a round of angles taken. The view from the summit is exceedingly fine; the vast plain stretches in all directions, the mountains of Teita rising out of it here and there; in the distance the mountains of Pare and U-sambara, to the north Kilima-kibomu, and behind it a splendid view of Kilima-njaro, his summit covered with snow; towards the coast the Rabai Hills, and north the hills of Giriama. It was altogether a grand panorama, but wanting in the charm given by fertility. The line of the river Voi could be seen by its green belt of trees, starting from the centre of Kilima-kibomu, and running nearly east, till it is lost in the distance towards Giriama. I could not stay long on the top, my men were too cold, and the wind was blowing as though it would like to blow us off; it had taken us nearly the whole day to ascend, but we were not more than three hours going down.

The next day I moved down to the plain at the foot for observations, as the clouds by day and the wind by night made it quite impossible anywhere up the mountain. There was game in plenty; buffalo, zebra, and different species of antelope. Rain having lately fallen close round the mountain, the grass was luxuriant. Buffalo were in great numbers, there were also plenty of guinea-fowl and partridge.

Next day we started for Ndara. A few hours after leaving the fort of Kasigao, I met and, in fact, found myself surrounded by, a large party,

some 150 people, from Kilima-kibomu, in war costume, armed with bows and arrows and Masai spears; they seemed to swarm from behind every bush. My guides that I had taken from Ndara knew them at once, and sung out to them, which prevented hostilities; after a palaver the chief of the expedition appeared; he was a handsome savage, dressed in a great quantity of brass wire, and carried an enormous spear highly polished; he was a friend of my guide; in fact, it turned out afterwards they had been on several expeditions together; they had heard I was there and intended to catch me at night; this they confided to me in the most cheerful way, but as I was under the care of a friend of their chief, and was going to Ndara, where they intended to bring their plunder for sale, they and I were to be at peace; this I agreed to. They were going to harry the people living on Kasigao Mountain. We passed on. The poison these people use is obtained from a tree in Giriama; it is very deadly when mixed with the blood, but may be eaten with impunity; it loses its power if exposed to the air, but retains it for a long time if kept in a covered place.

While I was at Ndara some of the party from Kilima-kibomu came there, bringing among other things several women that they had captured; they were bought by the people of Ndara for cattle, goats, &c.; the women so bought became the wives of the men who bought them, with all the privileges, rights, &c. They stay quite willingly with their new husbands; such violent changes of residence do not seem to disturb them very much; whether they work for a husband on Kasigao or Ndara is not much difference to them; not that they are without natural affection, but from a capacity they have to make the best of circumstances. They are extremely fond of their children, and, I believe, sometimes of their husbands. It does seem a cruel thing for people living on one hill to do this sort of thing to their neighbours. The poor folks on Kasigao were literally robbed of everything, and their houses burnt; those who resisted were killed; the few goats they had were taken away, and their wives were sold to other people.

After staying a couple of days at the foot of Kasigao, I started back on the 13th of June and crossed the plain to Maungu Mountain. On the following day I went to the summit, which I found to be 3383 feet above sea-level. Maungu is not so steep as Ndara; it is a granite mass like all the others, veined with quartz. There are some beds of limestone between it and Ndara and also a little sandstone; at the summit the rocks form a basin that holds the rain-water for some weeks; consequently the place is much resorted to by caravans; it is a stiff climb, and not a pleasant thing after a long day's march to have to climb some 2000 feet for your water; there are no springs; when I saw it the water had shrunk to a muddy pool, about three feet deep and about 20 feet round; it was so dirty and full of life that my porters could hardly drink it; I did not attempt it myself; even this small quantity will be

dried up in a few days unless rain falls, when there will be none obtainable between Taru and Ndara or Kasigao, some 50 or 60 miles.

The next morning we left Maungu at 4.30 A.M. and arrived at Taru at 7 P.M., stopping for one hour in the middle of the day. The distance by the road is about 40 miles; it was a very heavy march, and could not have been done if the porters' loads had been heavy; as it was, many of them had such swollen ankles and sore feet from it that I was compelled to give them a day's rest at Taru before moving again. The natives of Rabai, where my porters came from, are not strong; they have mostly been slaves at one time or another; their food is usually poor, and their blood is weak; small cuts or wounds turn into very nasty ulcers; they are willing enough, but really not able to stand continuous hard work; the experience of several who have tried them warrants the conclusion that they are not equal to Zanzibar porters in strength and stamina; in fact, a man who has once been a slave seems to fall physically as well as morally. The road I passed over was the same as when going, a very monotonous one, and aggravating to the last degree in its everlasting windings.

The next day I visited Taru Hills, which are some four miles from the water. There is some game in the neighbourhood, but the woods are very thick and thorny; from inquiries I made, and from own observation, I do not think this place could be trusted for water in the north-east or dry monsoon; during the south-west monsoon, which is the rainy season, water will always be found there, but in the dry season I should say most likely there will be none; the pond is not more than 12 feet deep, and not of great extent.

On the 17th of June we left Taru and came by the main road to Gorah; the road passes through some very pretty stretches of forest and glade, also many miles of shamba or cultivated lands of the Wa-duruma; they were all quite bare, nothing growing; it was pitiable to see where the Indian corn and other things had come up above the ground and then withered up; but there was absolutely no food growing for the people. We passed some Duruma villages, but saw no one, and from what I heard the people have gone to the coast to look for food.

We passed a place called Samburu, where there is water in holes in the sandstone rocks, but so full of vegetable and animal matter as to be quite unfit to drink; the wells at Gorah were quite dry, no rain having fallen since I passed there some weeks before.

After passing Gorah the hills become green, grass is seen, and everything becomes changed, as though by enchantment; the flowers were out, beautiful orchids in full blossom, grass luxuriant, trees covered with foliage—it was like a new country, and all this because a shower of rain had fallen; we camped for the night by a small stream, in whose bed were pools of water, a little brackish, but just drinkable; the stream joins the Mwache river, and together they run into Port Reitz.

The next morning we started for Mwache, passing through a very pretty undulating piece of country; we stopped at a place called Vougah, where there was formerly a village, destroyed by Masai, but finding no water there went on to Mwache, where we camped. At night the lions roared in regular chorus round us, showing that game was plentiful about. I do not think lions in this part of Africa are at all dangerous; they are heard at night, but very rarely seen by day; the natives catch them in pits occasionally, or shoot them with poisoned arrows. Leopards are very numerous, their peculiar grunt being heard at all times in the night.

The next morning we returned to Jomvu. It seems a pity that these Rabai Hills should be left to the wild animals; there are millions of acres of beautiful grass growing waste; the people are afraid to keep cattle on them, or to cultivate any distance from the large villages, called *kayas*, on account of the Masai. Some few years ago there were tens of thousands of cattle here, now there are none; a few little patches were cultivated, and wherever there was any the crop was coming up splendidly.

At Jomvu I was hospitably received by the Rev. Thomas Wakefield, resident missionary for the United Free Church Methodist Society. The same night we weighed with the land breeze at 1 A.M., and returned to Mombasa.

With regard to the slave trade, in that part of my district inhabited by the Wa-teita there is but little; strangers are compelled to work for those that capture them, and are sold from one owner to another, but, as a practical fact, they never remain long, the facilities for escape being so great. Caravans bringing slaves from Chagga to the coast do occasionally pass through, but at long intervals, and not many slaves at a time; those that are brought come from Mandara, the chief of Chagga, and are either Wa-chagga or Wa-rusa, a neighbouring tribe, with whom the Wa-chagga have constant fights, resulting in the capture and sale of each other's people.

Caravans coming from Chagga or the Masai country are compelled to pass through Teita, as there is positively no water by other routes from this part of the coast. Mr. Wray, who has lived on Ndara Mountain now for two years, assures me that he always hears of any caravan passing, and that very few have slaves; those that have are generally going to Vanga, where they are shipped to Pemba and other places; the road to Vanga branches off from the main road to Mombasa, near Taru, passing through the Duruma country; this information was confirmed by conversation I had with the people on Kasigao Mountain; they mentioned three caravans with slaves from Chagga during the last twelve months; the slaves are not in irons, or in the slave-fork, as a rule they are carrying nothing but their food and a water-bottle; there is none of that brutality practised here by those conducting a slave-caravan that

has been so often reported of those further south ; there is little or no ivory for them to bring down, and the slave himself is now so valuable on arrival at the coast that the owners find it worth their while to be almost kind to them.

It is gratifying to see that these natives, though barbarous in their dealings with each other, still have a distinct notion that the slave trade is wrong, and a thing to be spoken of with bated breath ; they remark and remember each caravan that passes with slaves, but of other caravans they take no particular notice.

The cultivation here is much the same as at the coast as to produce, but the cultivated parts are only immediately round the foot of the mountain, no one attempts to do anything on the plain. Sugar-cane appears to be indigenous ; it grows everywhere on the Ndara, but strange to say, there is none on Kasigao. Whatever is grown in Teita is only for the use of the Wa-teita, they have no idea of producing anything simply to sell ; there is no doubt if they were to collect the valuable gums which exude everywhere from the trees, they might carry on a considerable and remunerative traffic. There is also india-rubber, but not in large quantities. On the road through the Duruma country I saw a great deal of orchilla-weed, which only requires gathering, and sells in Mombasa for a good price ; it is only the laziness of the inhabitants that prevents their turning it to account. This year is an exceptionally bad one, from the failure of the usual rains, which should commence at the latter end of May, and continue in occasional showers through June ; very rarely much water falls in Duruma and Teita, but generally sufficient to give the people some sort of harvest, but this year the shambas are perfectly bare. During these times of famine the people sell their children and daughters to the coast people as slaves, but always redeem them as soon as a favourable season gives them the means. There is one fruitful source of distress in this district, which is the constant raids of the Masai ; the destruction caused by these savages is very great ; they simply leave a track of desolation behind them. I was glad to hear from Mr. Joseph Thomson, who had just returned from their country, that their immense herds of cattle were dying off in large numbers ; if so, they may have to give up their practice of living entirely on meat, and turn their hands to agriculture, which will tend to keep them at home ; should they do so, people about here would again keep large herds of cattle, sheep, and goats, which would lead to a trade in hides, tallow, ghee, &c. .

The route from Mombasa to the interior is always a trying one, but more so this year on account of the scarcity of water and food, but it has one advantage, that it is a healthy one ; there are no marshes or excessive vegetation to cause malaria ; the clouds at this time of year so temper the heat of the sun that walking all day in it has no ill effect ; the temperature inland is not high, the thermometer by day was seldom

over 80°, and by night fell usually to 65° and sometimes lower. A great part of the way the route is very interesting; from the summit of Ndara, and from the foot of Kasigao, a splendid view of Kilima-njaro is obtained, the snow on its summit glistening in the sun. The vast plain of Teita in ordinary years abounds with game; also when the rain falls there is plenty of food procurable. Cloth of various kinds and beads are the money of the country; the one thing is, that caravans should be well armed, as in this part of Africa hongo is demanded in larger proportion from a weak than a strong party. The Masai may be met with on the way, and should they be, they never attack Europeans armed with guns. Food and water are always procurable in abundance as soon as Teita is passed.

Accompanying this report is a map showing the route travelled, the position of the mountains, and the kind of country passed through. The positions are laid down by observation, and the heights are by boiling-point thermometer.

MOMBASA, June 26, 1884.

*Mr. C. Winnecke's last Explorations in the Northern Territory,
South Australia.*

Map, p. 614.

THE details of Mr. Charles Winnecke's most recent explorations (July 30 to December 2, 1883) in the Northern Territory of South Australia, accompanied by an excellent map, on the scale of 8 miles to an inch (of which a reduction accompanies these notes), have been received from Mr. G. W. Goyder, Surveyor-General of the Colony, through the courtesy of the London Agent-General. It will be remembered that Mr. Winnecke in 1878 continued the work commenced by Mr. Barclay in exploring the unknown region east of the telegraph line from Alice Springs, towards the western Queensland boundary, and of which mention is made in the R.G.S. 'Proceedings,' 1879, p. 334. Mr. Winnecke's first results were briefly notified in Petermann's 'Mittheilungen,' vol. xxv. (1879) p. 234; but he appears from the Report now under notice to have again made important explorations in 1881, of which there seems to be no accessible record.

Roughly speaking, his last journey is through entirely unknown country near the western Queensland boundary line, from about 27° 30' S. lat., when he crossed the Kallakoopah creek (an affluent of the Macumba, which feeds Lake Eyre on the north side), to about 22° 43' S. lat., his furthest point north of the Marshall river, his furthest western point being 136° 46' E. long.; and in this space, hitherto a great blank on the most recent maps, he has not only shown with precision the

existing physical conditions (especially with a view to the existence of water and other economic points), but has discovered and named various minor lakes and mountains, and one river, the Hay, an important feeder of the Marshall. As might be expected, the prevalent features of the country are high red sand ridges, offering very great obstacles to travel, mostly running from north-west to south-east, sometimes covered with spinifex and low scrub, and separated by sandy valleys more or less overgrown with the like plants, wattle, acacia, &c. Two so-called rivers or creeks, the Field, a tributary of the Mulligan or Eyre's river, running across the boundary line, and the Hay almost parallel with it, but more to the west, follow the general direction of these valleys, the first trending south-east, the latter north-west. Like many other Australian rivers, they widen out into flats, flooded or dry according to season, often densely timbered with large gum and box trees, and covered with good grass and herbage. The salt lakes discovered by the Expedition also to a great extent follow the north-west and south-east direction of the sandy valleys.

The party under Mr. Winnecke's leadership left Farina (also called "the Gums" or "Government Gums," the most northern station on the South Australian railroad) with loaded camels on July 30, 1883, reaching Cowarie Station, south of the Warburton, on August 11. Crossing that river and the Kallakoopah creek, they worked northwards to Minna Hill, an old trigonometrical station, near which a fair supply of slightly bitter water was discovered (named Warman's Well); from this point, a north-westerly course was followed to the corner post of the Queensland and South Australian boundaries, 138° E. long., 26° S. lat., through interminable sand ridges, and past various intensely white salt lakes, mostly long and narrow, the largest one being named Lake Dobbie, and a smaller one Lake Florence. Some of these were firm enough to allow the camels to walk across, though in places the surface was broken through; and it was noticed that all of them had an extremely high and very steep sand ridge invariably abutting on their western side, while the country near their eastern shore always consisted of low sand hills or flats. (It may be noted that the elevated mounds on one edge of the "fuljes" or deep horse-shoe shaped depressions in the similar sand-ridge district of the Arabian Nefūd, observed by Lady Anne Blunt, seemed to change position with the wind.) From the boundary post, a more or less north-westerly route was followed on the Northern Territory side through a perfectly desert country to about 25° S. lat., when an abrupt turn eastwards was made over the line into Queensland. This region will never be of much use to squatters, according to Mr. Winnecke, who is almost certain that it has never been visited even by natives. Some idea of the difficulty of travel in it may be gathered from the note that the camels had no water for sixteen days hereabouts, during which time they covered 278 miles; and that at every ridge they would lie down

and require much persuasion to cross, occasionally pitching their loads (over 700 lbs. each) and saddles over their heads on the descent. Some three weeks after passing this especially arid region, Mr. Winnecke's diary contains an entry of digging out an immense quantity of sand, &c., at a native well, into which the water drained very slowly, the camels drinking about forty gallons each. Continuing eastwards from the boundary line, the Mulligan river was struck, its water-holes teeming with fish, while flamingoes, emus, dingoes, pigeons, &c., were very abundant; and from this point the party worked north-west, parallel with the Field creek (which apparently joins the Mulligan), and then north-east to Sandringham Station on the latter river, which is shown to be nine miles out of position on the Government plans. After a rest here, Mr. Winnecke started again westwards, recrossing the Mulligan and Field and following up the latter to a water-hole called Alanajeer, near its origin in hills named the Adam Ranges, situated a little south of the 23rd parallel. The flood marks of the Mulligan were observed for a space of seven miles; it had no defined channel, but was a succession of wide flats subject to heavy inundations. Continuing westwards by the Adam Ranges, two high points of which were respectively named Mounts Tietkens and Smith, a wide sandy creek, named the Hay river, was reached, and found to be an affluent of the Marshall. Here the explorer struck northwards with the object of connecting with his former work, which he succeeded in doing, reaching the Tarlton Range containing Goyder's Pillars (both before named by him), in sight of his Central Mount Hawker. This mountain is near the westward and northward termination of the Jervois Range, and "is exactly in the centre of all Australia, a spot which many explorers have vainly tried to discover," where in 1881 Mr. Winnecke appears to have undergone great suffering, walking 300 miles through desert and spinifex, bootless, and ill from scurvy and rheumatic fever. "Goyder's Pillars" are two very peculiar white hills or peaks, situated on the top of a spur in the range; when viewed from a distance they have the appearance of white pillars, being crowned by perpendicular kaolin rocks. Having named another elevation, north of the Marshall, Mount Cornish, the party travelled along the Hay river in a south-easterly direction, naming Mount Winnecke on its eastern bank, and making excursions into the country on both sides, until arriving at a native well called Yarracurracoo, from which point further excursions were made to about 24° 34' S. lat., on one occasion coming very near the Queensland border, not far from Eyre's furthest point in 1845. A short journey to the west was also made, and a new lake, named Caroline, discovered, near Yarracurracoo well. This well receives most of the drainage of the clay pan flats west of the Hay river; no impression could be made on its water, which then (October) averaged 1000 gallons a day; and it would probably hold water for fully twelve

months after rain. Leaving the well on October 5, the return journey was commenced in a north-easterly direction to the Field river, two elevations on its western side being respectively named Mounts Knuckey and Dobbie, and some further explorations were made in the Adam Ranges among the creeks at its head, where Mr. Winnecke "disturbed a wild cat of an extraordinary size, nearly as large as a leopard" (presumably a *Dasyurus*). Sandringham station was once more reached by a south-easterly cut across the boundary line, and after crossing the Herbert and Mueller or Diamantina rivers (the latter a clay watercourse six miles wide, overgrown with *Polygonum*), the party arrived at Farina Station on December 1, and travelled from Beltana to Adelaide by rail.

Mr. Winnecke appears to have paid considerable attention to the botany of the region traversed, the productions of which, as being the central point of the Australian continent, are of exceptional interest. Baron F. von Mueller adds a list of 85 plants collected, several of which are entirely new either as species or varieties, or afford structural peculiarities.

Hydrographical Observations of the Nordenskiöld Expedition to Greenland, 1883.

By AXEL HAMBERG.

[Communicated by Baron NORDENSKIÖLD.]

I.

In order to carry out the observations of which I give an account in this paper, the expedition was provided with an excellent selection of apparatus and instruments. Observations of the temperature of the sea at great depths were made both with Miller-Casella and Negretti-Zambra thermometers, and for the latter we had at our disposal an apparatus which possessed several novel advantages. Samples of water were taken from greater depths by means of the water-bottle constructed by F. L. Ekman, while the specific weight of the sea-water was determined with carefully adjusted areometers, on the scale of which was marked the fourth decimal of the figure indicating the specific gravity. It was possible, at all events, to discern with certainty two fractions of the fifth decimal. As the areometer, however, always gives unsatisfactory results, as compared with the volumetric analysis with nitrate of silver (titration), the chlorine was also tested. With regard to the accuracy of these determinations 0.05 per cent. of the quantity obtained may be taken as the average difference between two carefully effected analyses.

In consequence of the peculiar differences in temperature found in some places, it became of great interest to ascertain the specific gravity of the various horizontal layers of water at their own temperature: as, however, the areometer in most instances does not give exact indications on this point, I have in various waters, whose saltness lies between 2.576 and 3.526 per cent., determined accurately the

proportion between the specific gravity and the amount of chlorine, by the aid of Sprengel's pycnometer, and from this calculated the following simple formula :—

Sp. gr. $\frac{0^\circ}{4^\circ} = 1 + \text{Cl.} (0\cdot00147 - 0\cdot000003 \text{ Cl.})$. Sp. gr. $\frac{0^\circ}{4^\circ}$ is, according to Ekman's method of designation,* equal the specific gravity at 0° , in proportion to pure water of $+ 4^\circ$ as standard. Cl. = gramme chlorine per litre at 0° .

The densities quoted in the following are, by the aid of this formula, calculated from the amount of chlorine, and then reduced to t° , i. e. the temperature *in situ*.

II.

Denmark Sound, between Iceland and Greenland, is from a hydrographical point of view very interesting. Currents of distinctly different nature are here represented within an unusually limited area. The warm current, the so-called Irminger current, which washes the western and northern shores of Iceland, has been fairly well studied as regards its temperature by the Danish Admiralty expedition in the *Fylla*, 1877-78.† The cold polar current of East Greenland has, however, previous to the Nordenskiöld expedition of last year, on account of the difficulty of approach, been comparatively little studied by scientists. The observations made have thus been confined to the edge of the current, on the borders of the warm current. Captain Mourier,‡ who, in 1879, continued the Danish researches in Denmark Sound in the *Ingolf*, observed during his journey along the polar current always a comparatively high temperature of the bottom, from which discovery he drew the conclusion that this current flows on a layer of comparatively warm water, when it has passed the bottom threshold between Iceland and Greenland. This statement cannot certainly be reconciled with Hoffmeyer's discussions of the *Fylla* expedition's observations in 1877 by the edge of the ice; but that Mourier was right in his assumption the Nordenskiöld expedition of last year has fully demonstrated by the series of important observations made in the very heart of the polar current.

On the basis of the researches of the above-mentioned expedition the following peculiarities of the polar current of East Greenland and adjacent warm seas have been demonstrated.

1. The cold polar current of East Greenland flows, throughout its whole course between 66° lat. N. and Cape Farewell, on warm water. If the faint, sometimes casual warming of the upper layers be not taken into account, a temperature, which increases with the depth, reigns in the polar current and underlying water layers, which the following table will show :—

Lat. N.		Long. W.		Depth in metres	0	50	100	150	200	400	700
59	43	43	16		} Temperature in Celsius {	+ 0·1	0·0	0·0	+ 1	+ 3	0	0
63	10	40	35	- 0·8		..	- 0·7	..	..	+ 0·2	+ 4
66	18	34	50	- 0·7		- 1·5	- 0·7	+ 1·5	+ 3·1		

* 'Kongl. Sv. Vetensk-Akad. Handl.,' ix., No. 4, p. 6.

† 'Ann. d. Hydr.,' 1880, pp. 173-192.

‡ 'Geografisk Tidsskrift' (R. Danish Geo. Society), iv., 1880, p. 47.

2. The depth of the polar current seems to depend on the depth of the sea. If 0° be taken as the limit of the polar water, we obtain the following values of the depths:—

Depth to the Bottom in Metres.	Depth of the Polar Current in Metres.	Lat. N.	Long. W.
90	82	65 33	37 32
215	100	59 43	43 16
255	120	66 18	34 50
750	(approx.) 350	63 10	40 35

Among these observations none has been used which would give a too small depth, by belonging to the eastern border of the polar current, where the depth of the cold water may be very small.

3. In the warm Atlantic Ocean, outside the polar current, a temperature which decreases with the depth naturally prevails. This circumstance corresponds with the division of the temperature in the polar current thus, that on the borders between the warm and the cold water a temperature prevails which in the upper layers increases and in the lower ones decreases with the depth, as the following table shows:—

Lat. N.	Long. W.	Depth in metres	0	25	50	100	150	200	250	450
62 35	40 41	Temperature in Celsius	+ 2.2	+ 3.9	+ 5.1	+ 5.7	..	+ 5.7	..	+ 5.1
65 25	37 15		+ 4.7	..	+ 5.5	..	+ 5.4	..	+ 5.2	

4. Hoffmeyer has already indicated that the surface water of the cold current is less salt than that of the warm Irminger current. This relation between coldness and saltness is very nearly proportional—at all events within certain limits—so that a higher temperature always bespeaks greater saltness.

During the return journey of the expedition, in August and September, alongside the polar current, the following observations of average saltness under the temperature indicated were obtained:—

Average Saltness Per Cent.	Mean Temperature in Celsius.	Number of Observations.
3.0545	- 0 18	8
3.3045	+ 3.00	2
3.4255	+ 4.55	2
3.4910	+ 7.83	3

5. The saltness of the polar current (between 67° and 59° lat. N.) seems during the summer to be lowest in the northern and highest in the southern parts. The average figures obtained were:—

Lat. N.	Per Cent. Salt.	Temperature.
59 and 60	3.164	+ 0.4
62 and 63	3.066	- 0.2
65 and 66	2.937	- 0.5

6. The saltness of the polar current varies probably greatly according to the seasons, and seems to be higher in the spring than autumn.

7. In the East Greenland polar current a saltness prevails which increases rapidly with the depth, as the following series will show:—

Lat. N.		Long. W.					
°	'	°	'	{ Depth in metres Temperature in Celsius Per cent. of salt	0	100	200
59	43	43	16		+ 0°·1	0°·0	+ 3°
					3·223	3·345	3·414

8. In the Irminger current, on the contrary, the conditions seem almost to agree with those found by Buchanan in the southern parts of the North Atlantic.*

In 65° 17' lat. N. and 30° 30' long. W., I have, from the average of two series of researches with chlorine, fairly corresponding with each other, found a saltness which increases very gradually in the upper layers, but which slowly decreases in the lower ones.

Depth in metres ..	0	100	500	1000	2025
Temp. in Celsius ..	+ 8°·6	+ 7°·2	+ 5°·6	+ 4°·4	+ 1°·2
Per cent. of salt ..	3·5225	3·5260	3·5225	3·5215	3·5100

9. In spite of the circumstance that the temperature of the polar current increases with the depth, and the saltness of the Irminger current decreases with the depth, the increase of temperature in the one case and the decrease of saltness in the other are sufficient to create in both currents a specific gravity which gradually increases with the depth (at the temperature *in situ*), which is shown by the following tables:—

THE POLAR CURRENT.

Lat. N.		Long. W.					
°	'	°	'	{ Depth in metres Temp. in Celsius Per cent. of salt Sp. gr. $\frac{t^{\circ}}{4^{\circ}}$	0	100	200
59	43	43	16		+ 0°·1	0°·0	+ 3°
					3·223	3·345	3·414
					1·02585	1·02683	1·02715

THE IRMINGER CURRENT.

Lat. N.		Long. W.							
°	'	°	'	{ Depth in metres Temp. in Celsius Per cent. of salt Sp. gr. $\frac{t^{\circ}}{4^{\circ}}$	0	100	500	1000	2025
°	'	°	'		+ 8°·6	+ 7°·2	+ 5°·6	+ 4°·4	+ 1°·2
65	17	30	30		3·5225	3·5260	3·5225	3·5215	3·5100
					1·02734	1·02756	1·02774	1·02786	1·02805

* 'Proc. R. G. S.,' 1877, p. 72.

10. The specific gravity at the temperature *in situ* is at the same depth less in the polar current than *outside* it. The cold East Greenland current, therefore, flows over a compact current of warm water from the Atlantic Ocean.

In consequence of the considerably lower specific gravity of the cold current, the warm and heavy one supports and lifts the polar water. The rising may in the southern part during the autumn (according to observations in 59° 43' lat. N. and 43° 16' long. W.) be estimated at 0·15 metre. But as the water in the polar current seems (*vide ante*, II. 5) to be less saline in its northern than southern parts, the former must lie higher still, and the East Greenland current, therefore, be flowing down an incline, tending southwards, due allowance being, of course, made for slight divergences and the attraction of *terra firma*. The lesser the saltness, the greater the incline should be, as well as the speed of the current, and, consequently, the variations of the speed of the current should correspond with the variations of the saltness (*ante*, II. 6).

The ice-masses which cause the polar current do not seem at any period of the year to spread so that the coast becomes free from ice, but their width is most probably affected by certain more or less regular variations, dependent on the seasons, a circumstance which it would be of great interest to ascertain, as it is closely connected with the question—At what season is the ice-belt on the south-east coast of Greenland easiest to penetrate?

The following particulars may contribute to solve this question:—

1. Several reports indicate that the ice-masses on the east coast diminish during the spring and summer. This is particularly demonstrated by a chart published by Dorst,* on which the retrogression of the ice-belt during the period March–August is apparent at a glance.

2. The observations of the ice made by the Nordenskiöld expedition last year prove that the quantity of ice in the polar current (between 60° and 66° lat. N.) was far greater in the middle of June than in the beginning of September.

3. Th. Thoroddsen's exhaustive exposition of the conditions of the ice around Iceland † shows that the drift-ice appears here often as early as January, and lasts until the autumn. During September, October, November, and December, however, there is, generally, very little ice.

4. According to the numerous observations by the Danish settlers and navigators on the south coast of Greenland, the polar ice always appears there in May, June, and July, whereas in November, December, January, and February there is no ice.

To all these variations with the seasons there are, of course, exceptions, while the quantity of ice is not the same in any two years. Nevertheless we may assume, supported by the above, that the polar current already in January and February begins to swell in its northernmost parts, attaining its maximum during the spring months, and to diminish in force during the summer, being during the autumn and winter comparatively insignificant. But, of course, all these changes occur later in the southern than the northern parts of the current.

The expeditions which have attempted to reach the east coast of Greenland generally have, as far as I am aware, entered upon the undertaking in the very height of the summer—in June, July, and the first half of August—and have all failed. Nordenskiöld, however, chose September, a far more suitable season—and succeeded. Maybe an attempt during October or November would be more successful still?

* 'Peterm. Mitth.', xxiii., 1877, p. 174, Tab. 10.

† 'Ymer' (R. Swedish Geo. Society), 1884, p. 145.

III.

Petermann assumed * that a warm current ran along the west coast of Greenland, extending far north, even to Melville Bay, Smith Sound, Jones Sound, and Lancaster Sound, making these waters navigable at certain periods of the season. Bessels, of the *Polaris* expedition, maintains † that Petermann's assumption is formed without knowledge of facts. He asserts that no trace of a warm current is felt beyond 75° lat. N., and seems almost inclined to disbelieve altogether the existence of this arm of the Gulf Stream.

The temperatures found in the sea on the west coast of Greenland by the Nordenskiöld expedition were generally low, even below 0°. At greater depths, very low temperatures were always found, while the saltness was comparatively small. The following series of observations may serve as an example:—

Lat. N.	Long. W.	Depth in Metres.	Temperature in Celsius.	Per Cent. Salt.
61 15	49 11	0	+ 0.8	3.136
"	"	100	+ 0.5	3.366
"	"	125	0.0	
65 " 15	53 " 30	0	+ 1.5	3.352
"	"	75	+ 1.1	3.361
"	"	125	+ 0.2	3.368
70 " 29	55 " 40	0	+ 4.4	3.309
"	"	40	+ 1	
"	"	90	- 0.2	3.374

These figures do not seem to confirm Petermann's theory as to a warm current along the west coast of Greenland, and, still, he may be in some measure right.

Carpenter has demonstrated ‡ the presence of extensive layers of comparatively warm water in those parts of Davis Sound which are far from the Greenland coast, even in 63° lat. N., and what is more natural than that the American polar current—the existence of which is a fact—should create a counter current in the eastern parts of the sharply defined bay, the bottom of which is called Baffin Bay?

It is now thirty years since Irminger demonstrated § that the East Greenland polar current, on having reached Cape Farewell, continues to flow along the coast westwards and northwards. That the polar current, or, perhaps, more correctly, the polar ice thus changes its original course seems to me to indicate that an arm of the Gulf Stream really flows into Davis Sound. But, during the greater part of the year, this arm has nothing but the direction in common with the Petermann current. Its temperature may be very different.

If therefore, as Petermann believed, an arm of the Gulf Stream flows towards Davis Sound, it strikes the polar current of East Greenland at Cape Farewell, and carries a great deal of drift-ice from the same westwards and northwards, which reduces the temperature and the saltness to such an extent that the current assumes the character of a cold stream. These effects of the polar current are most apparent on the south-west coast, while further north the conditions become equalised with

* 'Peterm. Mitth.,' 1867, p. 184, and 1870, p. 220.

† 'Scientific Results,' &c., vol. i., Phys. observ., p. 13, by E. Bessels. Washington, 1876.

‡ 'Proc. of the Royal Society,' vol. xxv. p. 230.

§ 'Nyt Archiv for Sövesenet' (Copenhagen), ix., No. 4.

those at a greater distance from the shore. This is fully proved by our observations of the saltness of the sea along the west coast in August last.

	Lat. N.	Per Cent. Salt.	Number of Observations.
	From 60 to 63	3.1328	4
	" 63 " 65	3.2027	3
	" 65 " 67	3.2920	2
	" 67 " 68	3.3250	2
	" 68 " 71	3.2970	2
	" 71 " 73	3.2320	3

It seems, therefore, that the sea-water was, at all events on this occasion, poor in salt in the vicinity of the polar current, and richer the further away we got from it. The saltness seemed to have attained its maximum at about 67°-68° lat. N., whence it again decreases northward and in the recesses of Baffin Bay.

If we may assume that the East Greenland polar current affects the temperature and saltness in the manner I have indicated, the changes which the polar current suffers at the various seasons should cause corresponding ones on the west coast. Thus, when the polar current during the spring and summer carries to South Greenland large quantities of ice, the latter would make the warm and concentrated water of Davis Sound thinner and colder. But if, on the other hand, the polar current shrinks during autumn and winter, and no drift-ice appears on the south coast of Greenland, the arm of the Gulf Stream assumed by Petermann ought to have full sway. During the late autumn and winter, therefore, warmer and salter water should be found along the west coast of Greenland.

IV.

In several fjords, as, for instance, those of Julianehaab, Arsuk, and Waigat, the expedition found a remarkable division of temperature, which has previously been observed in Arctic and Antarctic regions. It consists in the presence of a layer of cold water between two comparatively warm ones, of which one lies at the surface and the other at the bottom. As an example of the variation in the temperature, the following table may serve:—

60° 42' l. N. 46° 0' 20" l. W., at Julianehaab	Depth in metres	0	5	15	30	75	125	225	
	Temp. in Celsius	+9°·2	+3°·3	0°·0	-0°·2	-0°·5	-0°·3	+0°·6	
In the middle of Arsukfjord off Ivigtut	Depth in metres	0	10	25	50	75	150	300	560
	Temp. in Celsius	+7°·3	+2°·0	+1°·0	+0°·1	0°·0	-0°·4	+1°·4	+1°·8
69° 51' l. N. 51° 37' l. W. (Waigat)	Depth in metres	0	75	165	360	550	640 (?)		
	Temp. in Celsius	+5°·0	-0°·3	-0°·8	+0°·9	+1°·3	+1°·5		

Thus, from a maximum at the surface the temperature falls rapidly at first, then slowly, to a minimum in an intermediary depth, again to rise, first quickly, then slowly, towards the bottom to a secondary maximum. The increasing saltness

towards the bottom is more than sufficient, in spite of the changes in the temperature, to cause a specific gravity which constantly increases with the depth (with the temperature *in situ*), as the following table shows:—

In the middle of Arsukfjord off Ivigut ..	Depth in metres ..	0	75	150	300	550
	Temp. in Celsius ..	+7°·3	0°·0	-0°·4	+1°·4	+1°·7
	Per cent. salt ..	1·910	3·284	3·322	3·401	3·411
	Sp. gr. $\frac{t^{\circ}}{4^{\circ}}$..	1·01500	1·02635	1·02663	1·02718	1·02723

One of these fjords, Arsukfjord, was the object of a somewhat exhaustive study, but I do not think that a great many details about these small, although interesting, basins will be of general interest enough to be treated here.

With regard to the cause of this remarkable division of temperature, Mohn has advanced a satisfactory explanation,* as far as the Norway fjords are concerned—where similar conditions prevail—viz. that the surface maximum is caused by the heat of the summer, the minimum by the cold of the winter, and the lowest maximum by the remaining effects of the previous summer. But the Greenland fjords are in many respects different from those of Norway, and one great factor must also not be forgotten—the inland ice.

In many fjords the inland ice acts directly by their glaciers, in all of them through icebergs, and these actions are continued all the year round. It is evident that these enormous ice-masses, which are frequent and some hundred metres in depth, must greatly affect narrow and confined basins, and it is impossible that any such high temperature as that registered in the Arsukfjord and the Waigat could penetrate to the bottom. (Comp. the series below by M. Hammer.)

That the warm temperature on the surface is due to the sun, as Mohn maintains, is of course only natural.

The low temperature of the middle, cold layers is probably caused by the inland ice and the winter cold, and the lowest warm one can only retain its heat by the connection of the fjord with the sea. The fjords are certainly to some extent barred by elevated thresholds at the bottom, but these cannot possibly prevent the outflowing fjord currents from creating reactive currents from the sea, or that the latter at every tide flow into the fjord, where the greater weight of the sea-water causes it to form the lowest layers. According to what has been previously stated relating to the conditions of the sea along the west coast of Greenland, it seems that it is in the winter chiefly that the lowest warm layers of the fjords receive their heat and saltness.

Taken in conjunction with the conditions found by me in the summer, Hammer's serial temperatures registered early in the winter on the Jakobshavn ice fjord may be explained.† I append some of them.

No.	Depth in fathoms }	0	5	10	20	30	40	60	70	80	100	110	140	159	163	209
1	Tempera- ture in Celsius	0°·0	..	+1°·3	+1°·9	..	+2°·0	..	..	+0°·7	..	+1°·0	..	..	+2°·0	..
2		-2°·2	-1°·2	-0°·9	-0°·4	-0°·3	..	0°·0	..	..	+0°·7	..	+0°·7	..	..	..
3		-2°·4	-1°·0	-0°·7	-0°·7	-0°·3	+1°·0	..	+0°·3	..	..	+0°·4	..	+0°·5	..	+0°·9

* 'Peterm. Mitth.,' Ergänz., H. 63, p. 14.

† 'Meddelelser om Grönland,' Part 4. Copenhagen, 1883, p. 28.

If these figures be compared with my own, it will be found that the difference is found chiefly nearest the surface, a difference which is not difficult of explanation. The winter cold has cooled the layers warm since the summer, but (*ante*, II. 1 and 3) not to such a depth that the whole has been penetrated. There still remains, at a depth of 40 fathoms, some of the summer heat, which may, during the winter and under the influence of icebergs, entirely disappear.

That the first maximum cannot be sufficient to maintain the high temperature at the bottom is self-evident.

V.

In Baffin Bay the expedition found conditions of temperature more complicated still. This bay is, as is generally known, connected with the Atlantic Ocean through Davis Sound and with the Polar Ocean through Jones, Lancaster, and Smith Sounds. This peculiar situation between two oceans of different nature may account for the hydrographical conditions; and the presence of alternating layers of cold and warm water, which were often found in the immediate vicinity of water of a polar character, seems to be characteristic even of Baffin Bay.

Whilst the water of the Atlantic varies but little in specific gravity, that of the Polar Sea varies considerably. During the summer the surface of the sea, generally covered by drifting ice-masses, possesses a very low density, at all events lower than that of the ice-free oceans, while the undiluted lower layers, on account of the low temperature, possess a high specific gravity. A surface of polar water, of low temperature and small saltness, under this a comparatively warm layer, and lowest again a cold one, should, in consequence of these causes, be the simplest condition prevailing at the lower depths of Baffin Bay, and that this is really the case the following serial temperatures will show:—

74° 0' lat. N.	Depth in metres	0	. 45	90	300	500	700	1000	1450
64° 30' long. W.		Temp. in Celsius	+1°·5	-1°·0	-1°·7	-1°·5	-0°·9	+0°·4	-0°·1	-0°·3

Of the two minima here the lowest is naturally wanting in shallower places.

But besides this simple and regular division of temperature, some very complicated conditions may also be found. The following series shows three maxima and two minima:—

Melville Bay.	Depth in metres	0	200	300	400	500	700	820
75° 20' lat. N. long. (?)		Temp. in Celsius	+1°·9	-0°·3	+0°·4	-0°·5	-0°·9	+0°·7	+1°·2

The saltness seems to increase rapidly with the depth. At the surface thus it has been found to be between 2·8 and 3·3 per cent., while at a depth of 625 metres 3·446 per cent. have been found.

A comparison of the observations which the Nordenskiöld expedition made in Baffin Bay in 1883, seems to indicate that, at all events on that occasion, there was, between the polar waters of various specific gravity, a comparatively warm layer of water (above 0°) originated by the Atlantic Ocean, which rested against the shores of West Greenland and followed the same up to Smith Sound.

In the deeper parts of these waters and their northern continuations, Nares* and Moss† believe they found a faint current from the Atlantic Ocean. Moss says with reference thereto: "The channels between the Polar Sea and Smith Sound contain two strata of sea-water, not owing their temperatures to local causes—an upper stratum of polar water overlies a warmer northward-flowing extension of the Atlantic."

GEOGRAPHICAL NOTES.

The New Session of the Society will commence on Monday the 3rd of November, with a paper by Mr. Joseph Thomson on his recent journey through the Masai country to Victoria Nyanza. The second meeting will be held on the 24th of November.

General M'Iver's proposed Expedition to New Guinea.—With regard to General M'Iver's proposal to the Geographical Society of Australasia, recorded in the September number of the 'Proceedings' (p. 537), we have received subsequent information to the effect that the High Commissioner for the Western Pacific having notified to the Society in Sydney that any such expedition in New Guinea at the present time would do harm out of all proportion to the good likely to result, the Society has replied that they had no intention of giving their sanction to the expedition.

Recent News from the River Shire.—Mr. Consul O'Neill, who went from Mozambique to the Zambesi and Shiré in April last, to aid Captain Foot, R.N., in his attempts to restore peace on the Shiré—disturbed by the hostile attitude of the Makololo consequent on the death of the chief Chipatula by the hand of an English elephant hunter—reached the mission settlement of Blantyre by an entirely new land-route from the lower Shiré. He left the river at Chironji, in S. lat. 16° 57', passing well to the east of the Makololo district via Mlolo (or Mongwe Hill), Manasomba or Mangasanji, and the south-west extremity of Milanji. At all these places and a number of others on the route he was able to take astronomical observations, and he promises to send us a narrative of the journey and a map as soon as he is able. At Blantyre he has decided on attempting a series of observations to fix the longitude of the place by way of establishing a meridian in East Central Africa, a desideratum of the highest importance to the accurate mapping of the region. He had already (July 3rd) obtained 136 sets of lunar distances and about 55 sets of moon's altitudes for absolute longitude, besides a large number of independent chronometer observations taken for rating, and he hoped before he left to be able to get 300 more sets of lunars.—Captain Foot, writing from Blantyre on the 8th of July, says

* 'Voyage to the Polar Sea,' vol. ii., London, 1878, p. 158.

† 'Proc. of the Royal Soc.,' xxvii., 1878, p. 545.

his negotiations with the Makololo for the re-opening of the river were in a fair way of success; but these local disturbances had prevented him from carrying out his plan of a trip to Lake Tanganyika. In March he made an excursion to the west and north of Lake Shirwa, during which he ascended to the summit of Mount Chaoni (about 4000 feet above sea-level), whence he saw the lake Chiuta, discovered a short time before by Mr. O'Neill. Captain Foot was accompanied on this excursion by Mr. J. Buchanan, of the M'lungasi estate, south-east of Zomba, who had previously heard of a lake as lying to the north of Shirwa. The view from Mount Chaoni is described by Captain Foot as of wide extent and indescribable beauty, embracing in its range the Shiré, Lakes Pamelombe and Nyassa, and the Mangoche Peak to the northward, Mount M'langi more than 60 miles to the south, and Zomba to the south-west, and the sharply defined blue hills on the further shore of Lake Shirwa, whose waters lie spread out almost beneath the spectator. The climate of these African highlands is well spoken of by Captain Foot, who finds it well suited to European constitutions. Coffee, wheat, oats, and English vegetables alike thrive in the district.

Mr. W. O. M'Ewan.—This gentleman, who was appointed to superintend the construction of the road between Lakes Nyassa and Tanganyika, in the place of the late Mr. James Stewart, c.z., has written to inform us of his arrival at Chironji, on the river Shiré. At the date of writing (July 6th, 1884), he was on board the steamer *Lady Nyassa*, and he hoped to arrive at Blantyre on July 26th. Owing to the disturbed state of the country, he had been detained near the coast for more than two months, but matters having become more settled he was enabled to proceed by the Kwakwa river to the Zambesi. Before leaving England Mr. M'Ewan went through a course of instruction in practical astronomy under the Society's Instructor, and it will be remembered that he was awarded the Peek Grant at our last Anniversary for the efficiency he attained in that subject. He has already forwarded to the Society some observations which have been most carefully taken and computed, and which give us good reason to expect that Mr. M'Ewan will make use of the knowledge he has acquired in fixing the positions, by astronomical observation, of the more important places that he may visit.

The Nile Route, Halfa to Debba.—The following notes on the route from Wady-Halfa to Debba have been received under date of September 2nd, Camp Mekanisa, from our Associate, Mr. Ernest A. Floyer, Inspector-General of Railways and Telegraphs in the Sūdān:—"The road from Dongola to Debba is perfectly straight, through flat, sandy desert. The distance is, I think, much exaggerated, judging by the only map I have with me (Stanford, 1883). I rode it in 20½ hours, and make it 85 miles. The route from Halfa to Dongola is also inaccurate; e. g., Sakiet-el-Abd

is placed south of Say Island, which is given as ten miles long, whereas it is really only one mile long, and is actually south of Sakiet-el-Abd.* Debba has no cultivation in its immediate neighbourhood, though there are plantations at short distances both up and down the river on the sandy waste. On the north bank, where large boats can lie alongside, is built a roughly rectangular fort, partly of mud and partly of burnt brick. My route from Halfa to Debba (west bank) is as follows:—

Halfa.	Miles.
Surraas; good travelling; village	21
Semna; heavy sand, hilly, village	14
Mekanisa; water, little shade.. .. .	15
Tangūr; dates	7
Okme; village, 25 Sākias	8
Dal; village	10
Nakhl Mahmud; Akaba (or desert road, cutting off a bend in the river), village	22
Sakiet-el-Abd; village, dates.. .. .	4
Suleb; very heavy travelling, village, dates	23
Tajab; Akaba, dates, village	38
Haft; dates, village	26
Dongola	20
Handak; large village	35
Bumi; village	16
Kinkelab; village	9
Debba	25
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Liberia.—In a recent report, the United States Consul in Liberia, West Coast of Africa, estimates the population of that Republic at 767,500, distributed as follows:—Aborigines not yet enjoying full rights of citizenship, 750,000; issue of immigrants and aborigines, civilised aborigines, 5000; immigrants, 12,000; descendants of immigrants, 500. The Cavalla river, which he deems to be perhaps the most important water-course in Liberia, and which has been navigated for 200 miles, is represented as of great trading and commercial importance; gold washings, in addition to agricultural resources, having already been found on its banks. The United States Government have authorised the opening of two more ports in Liberia, one at Niffou in the county of Sinou, the other in the county of Montserrado. The United States Legislature have further authorised the establishment of a settlement at the south-eastern limit of the Republic, San Pedro.

Siam.—The United States Consul at Bangkok in his report of this year gives some particulars regarding Chantabun, the Siamese port on the eastern shore of the gulf. Its mixed population of Chinese, Annamese and Siamese is estimated at 30,000. It exports pepper to the amount of 25,000 piculs annually (1 picul = 133½ lbs.), precious stones, cardamoms and ivory in small quantities. Coffee is produced on the

* The position is correctly given in the War Office map.—Ed.

sides of the bordering hills. In the alluvial plains 20 miles inland and stretching as many more in a north-west direction towards Batambong, sapphires are found not inferior to those of Ceylon. The French are endeavouring with every promise of success to establish a line of steamships from Bangkok via Chantabun to Saigon, the capital of French Cochinchina.

Trade of Yunnan.—The following extracts from a report on the trade of Yunnan by the Red River (Songkoi), prepared in 1880 by the French Consul, Count de Kergrader, and which the United States Consul understands to be still applicable, may be of interest. Exports from Hanoi to Yunnan during 1879:—Salt, 120,000 francs; tobacco, 680,000 francs; raw cotton, 200,000 francs; cotton goods, 50,000 francs (English manufacture); cotton yarn, 24,000 francs (English manufacture); light woollen cloths, 16,000 francs (German); pedlers' ware, 15,000 francs (chiefly gilt buttons from England), &c.; total, 1,170,000 francs. Exports from Yunnan to Hanoi during 1879:—Tin, 1,700,000 francs; lead, 5000 francs; tea, 60,000 francs; false gambier, 30,000 francs; total, 2,055,000 francs. The excess of exports from Yunnan over its imports, 885,000 francs, represents—seeing the traffic is one exclusively of barter—(1) Cost of transport to and from; (2) duties paid on the route to the Annamese interior Customs; (3) duties levied by the Black Flags; (4) traders' profits.

The "Victoria Falls" of the Curitiba.—In Don Ramon Lista's account of his recent journey on the Upper Paraná, to which reference is made in "New Books," *infra*, there is a description of a magnificent cataract on the Curitiba or I-guazú, an eastern affluent of that river, rising in the Sierras of San Paulo in Brazil, and which does not seem to have been noticed in any accessible publication, though meriting a prominent place in any list of the waterfalls of the world. This cataract, which Don Ramon actually visited, is situated about six leagues from the point of junction of the Curitiba with the Paraná, and is locally called "Salto Victoria." Its sheer fall is over 170 feet, and it is no less than 1365 yards wide (over three-quarters of a mile), being composed of three different sections, apparently continuous when seen at any distance. There is always a very full supply of water, which, as it dashes over the cataract with a noise that can be heard on quiet days for a radius of eight or nine miles, gives off constantly ascending clouds of spray between 200 and 300 feet high, showing the usual prismatic colours and falling again in a condensed form like small rain.

Results of the International Polar Commission.—The reports to the Finland Society of Sciences on the work and chief results of the Finland Polar Expedition to Sodankylä in Finnish Lapland during 1883-84, of which an extract is given by S. Lemström in the sixth part of the 'Mittheilungen der Internationalen Polar-Commission,' just received,

contain the following deductions. The North Pole is surrounded by a zone in which terrestrial electric currents are stronger and more variable than on its northern or southern sides, and the position of which probably depends on a polar auroral zone. The polar aurora is produced by an atmospheric electric current, which is capable of being measured and generally of being studied by the practical methods employed by the Finland expedition, whose instruments have very often produced a diffused light giving the known spectroscopic reaction of the polar aurora.

New Commercial Geographical Society at Havre.—The first number of the Bulletin of the Société de Géographie Commerciale du Havre has recently been published, from which it appears that 251 active members have already been enrolled (with 25 honorary and corresponding members), under the Presidentship of M. Géés, Director of the Upper Commercial School at Havre, the General Secretary being M. P. Loiseau. The objects of the Society are essentially practical, and the publication is to be quarterly; the present issue contains a long analysis of a recent Report on Paraguay by M. Mancini, the French Consular Agent at Asuncion; also a notice of Céara or Fortaleza in North Brazil, by Dr. Gouy.

Obituary.

Sir Frederick Palgrave Barlee, K.C.M.G.—The very sudden death of this gentleman, on August 7th last, at St. Ann's, Trinidad, where he had gone to administer the Government of the island during the illness of Sir Sanford Freeling, has deprived the Royal Geographical Society of a Fellow of many years' standing (he was elected so long ago as 1862), who in his different official capacities had not only the best interests of geographical enterprise at heart, but never neglected to communicate early information and forward Colonial works of a nature likely to interest our members. He was born on February 6, 1827, being the third son of the Rev. Edward Barlee, M.A., Rector of Worlingworth-cum-Southolt in the county of Suffolk. After serving from 1844 to 1855 in the Ordnance Department, during nearly four years of which period he was Barrack-master and Storekeeper at Sierra Leone, he was appointed Colonial Secretary of Western Australia, and a Member of the Executive and Legislative Councils, remaining in the Colony for 21 years, having resigned his seat in Council in November 1875. During this time he took an active part in the encouragement of Australian exploration, especially in Mr. John Forrest's expeditions; and his name has obtained a permanent place in geography, from that traveller having given it to the great lake Barlee, situated about 29° S. lat. and 119°–120° E. long., which he discovered on his first journey in 1869, when endeavouring to find the remains of Leichhardt's party (Proc. R.G.S., xiv. 1870, p. 192). In 1877, he was appointed Lieutenant-Governor of British Honduras (being then made C.M.G.), where he again at once had an opportunity of extending official support in aid of Mr. H. Fowler's interesting journey across the unexplored portion of that Colony, and in publishing its results (see Proc. R.G.S. 1880, p. 129). His attention here was mainly devoted to opening up a fruit trade between British

Honduras and the West India Islands, and in other ways developing a somewhat neglected Colony, which was at the time of his appointment subject to danger from the Ycaiche and Santa Cruz Indians, whom his firmness subdued and conciliated; but he nevertheless found time to encourage and assist the explorations of Dr. Le Plongeon in Yucatan, which are adding so materially to our knowledge of the architectural remains and habits of its ancient inhabitants. In 1883 (when he received the dignity of K.C.M.G.) he resigned his appointment and returned to England, suffering considerably from asthma; but was soon prepared for further work, leaving on June 2nd last for Trinidad, where he died. Short as his stay was in the island, he had already won the good opinion of its inhabitants, as testified by the regretful notices in the local press after his death. He was married in 1855 to Jane, daughter of Edward John Oseland, Esq., of Coleraine, who survives him, but he leaves no family.

PROCEEDINGS OF THE GEOGRAPHICAL SECTION OF THE BRITISH ASSOCIATION.

MONTREAL MEETING, 1884.

THE Meeting of the British Association, held this year in Canada, at Montreal, commenced on the 27th of August. The Geographical Section was organised as follows:—

PRESIDENT:—General Sir J. H. Lefroy, R.A., C.B., K.C.M.G., F.R.S., Vice-President Royal Geographical Society.

VICE-PRESIDENTS:—Colonel Rhodes (Quebec); P. L. Sclater, M.A., PH.D., F.R.S., F.R.G.S.

SECRETARIES:—Rev. Abbé Laflamme (Quebec); J. S. O'Halloran; J. Fraser Torrance, B.A. (Montreal); E. G. Ravenstein (*Recorder*).

COMMITTEE:—John Ball, M.A., F.R.S.; W. T. Blanford, F.R.S.; Robert Capper, Assoc. I.C.E.; Prof. Charles Carpmael (Toronto); Rev. Canon Carver, D.D.; W. B. Cheadle, M.A., M.D.; Sir James N. Douglass; Charles Gibb (Quebec); James Glaisher, F.R.S.; F. J. Horniman; J. Beaufort Hurlbert, LL.D. (Ottawa); Capt. Bedford Pim, R.N.; Trelawney W. Saunders; Henry Seeböhm; Sir Richard Temple, G.C.S.I., C.I.E., D.C.L., LL.D., &c.; William Westgarth; John W. Woodall.

The Section met at the gymnasium of the Montreal Athletic Association, a spacious building, affording accommodation for about 600 auditors, and this was the number actually present when Lieuts. Greely and Ray read their papers on Arctic Experiences. The President's Address was listened to by above 200 persons, but on other occasions the attendance sometimes was small, a circumstance due partly to the distance of the meeting place from McGill College, the official headquarters and rooms of nearly all other sections.

Thursday, August 28th.

The President opened the meeting with the following Address:—

Connected as I was in early life with this country, and for several years associated with one of its scientific institutions and one of its scientific societies, I cannot but

feel proud and gratified to be honoured at this late day, and on so memorable an occasion, with the Presidency of this Section. I will not ask your indulgence for any weakness you may observe in my discharge of its obligations, nor will I plead what, however, I feel very strongly, that the lapse of thirty years since I last had the honour to address an audience in Canada, has not been wholly advantageous to my position. I may, however, make one observation. It is, that whereas the short interval elapsed since the delivery of an exhaustive summary of Geographical Progress by the President of the Royal Geographical Society, makes it at all times difficult for the President of this Section to find fresh topics, I have been made more than usually conscious of that disadvantage by having to close the present address some weeks earlier than would be necessary at a meeting held in Great Britain.

2. Man's acquaintance with the planet he inhabits, with the earth which he is to replenish and to subdue, has been a thing of growth so slow, and is yet so imperfect, that we may look to a far distant day for an approach to a full knowledge of the marvels it offers, and the provision it contains for his well-being. He has seen, as we now generally believe, in silent operation, the balanced forces which have replaced the glacier by the forest and the field; which have carved out our present delights of hill and dale in many lands, and clothed them with beauty; and it may be that changes as great will pass over the face of the earth before the last page of its history is written in the books of eternity. But it is no longer before unobservant eyes that the procession of ages passes. Geography records the onward march of human families, often by names which survive them, it rears enduring monuments to great discoverers, leaders, and sufferers; it is an indispensable minister to our every-day wants and inquiries; but beyond this it satisfies one of the most widely diffused and instinctive cravings of the human intelligence, one which from childhood to maturity, from maturity to old age, invests books of travels with an interest belonging to no other class of literature. If "the proper study of mankind is man," where else can we learn so much about him, or be presented with such perplexing problems, such diversity in unity, such almost incredible contrasts in the uses of that noble reason, that Godlike apprehension, which our great poet attributes to him; or see the "beauty of the world, the paragon of animals,"* in conditions so unlike his birthright. Geography, then, is far from being justly regarded as a dry record of details which we scarcely care to know, and of statistics which are often out of date.

3. It is scarcely necessary to do more than allude here to the intimate relations between geography and geology. The changes on the earth's surface effected within historical times by the operation of geological causes, and enumerated in geological books, are far more numerous and generally distributed than most persons are aware of; and they are by no means confined to sea coasts, although the presence of a natural datum in the level of the sea makes them more observed there. A recent German writer, Dr. Hahn, has enumerated ninety-six more or less extensive tracts known to be rising or sinking. We owe to Mr. R. A. Peacock the accumulation of abundant evidence that the island of Jersey had no existence in Ptolemy's time, and probably was not wholly cut off from the Continent before the fourth or fifth century. Mr. A. Howarth has collected similar proofs as to the Arctic regions; and every fresh discovery adds to the number. Thus the gallant, ill-fated De Long, a name not to be mentioned without homage to heroic courage and almost superhuman endurance, found evidence that Bennett Island has risen 100 feet in quite recent times. NordenSKIÖLD found the remains of whales, evidently killed by the early

* 'Hamlet,' act ii. sc. 2.

Dutch fishers, on elevated terraces of Martin's Island. The recent conclusion of Professor Hull, that the land between Suez and the Bitter Lakes has risen since the Exodus, throws fresh light on the Mosaic account of that great event; and to go still further south, we learn from the Indian Survey that it is "almost certain" that the mean sea-level at Madras is a foot lower, i. e. the land a foot higher, than it was sixty years ago. If I do not refer to the changes on the west side of Hudson Bay, for a distance of at least 600 miles, it is only because I presume that the researches of Dr. Robert Bell are too well known here to require it. Any of my hearers who may have visited Bermuda are aware that so gently has that island subsided, that great hangings of stalactite, unbroken, may be found dipping many feet into the sea, or at all events, into salt-water pools standing at the same level, and we have no reason to suppose the sinking to have come to an end. We learn from the Chinese annals that the so-called hot lake Issyk-kul, of Turkistan, was formed by some convulsions of nature about 160 years ago,* and there seems no good reason to reject the Japanese legend that Fusi-yama itself was suddenly thrown up in the third century before our era (B.C. 286). These are but illustrations of the assertion I began with, that geography and geology are very nearly connected, and it would be equally easy to show on how many points we touch the domain of botany and natural history. The flight of birds has often guided navigators to undiscovered lands. Nordenskiöld went so far as to infer the existence of "vast tracts, with high mountains, with valleys filled with glaciers, and with precipitous peaks" between Wrangel Land and the American shores of the Polar Sea, from no other sign than the multitudes of birds winging their way northward in the spring of 1879, from the *Vega's* winter quarters. The walrus hunters of Spitzbergen drew the same conclusion in a previous voyage from the flight of birds towards the Pole from the European side. Certainly no traveller in the more northern latitudes of this continent in the autumn, can fail to reflect on the ceaseless circulation of the tide of life in the beautiful harmony of nature, when he finds that he can scarcely raise his eyes from his book at any moment, or direct them to any quarter of the heavens, without seeing countless numbers of wild fowl, guided by unerring instinct, directing their timely flight towards the milder climates of the South.

4. To address you on the subject of geography, and omit mention of the progress made within these very few years in our knowledge of the geography of this Dominion, might indeed appear an unaccountable, if not an unpardonable oversight; nevertheless, I propose to touch upon it but briefly, for two reasons: first, I said nearly all I have to say upon a similar occasion four years ago; secondly and chiefly, because I hope that some of those adventurous and scientific travellers who have been engaged in pushing the explorations of the Geological Survey and of the Canada Pacific Railway into unknown regions, will have reserved some communications for this Section. I cannot, however, refrain from alluding to that remarkable discovery recently communicated to the Geographical Society of Quebec by M. N. A. Comeau, of which we shall, I hope, hear fuller particulars from Professor Laffamme. I mean the extent and importance of Lake Mistassini. That it should be left to this day to discover in no very remote part of the north-east, a lake rivalling Lake Ontario if not Lake Superior in magnitude, is a pleasant example of the surprises geography has in store for its votaries. Canada comprises within its limits two spots of a physical interest not surpassed by any others on the globe. I mean the pole of vertical magnetic attraction, commonly called the magnetic pole, and the focus of greatest magnetic force; also often, but incorrectly, called a pole. The first of these, discovered by Ross in 1835, was

* 'Proc. B. G. S.,' vol. xviii. p. 250.

revisited in May 1847 by officers of the Franklin Expedition, whose observations have perished, and was again reached or very nearly so by McClintock in 1859, and by Schwatka in 1879; neither of these explorers, however, was equipped for observation. The utmost interest attaches to the question whether the magnetic pole has shifted its position in fifty years, and although I am far from rating the difficulty lightly, it is probably approachable overland, without the great cost of an Arctic expedition. The second has never been visited at all, although Dr. R. Bell, in his exploration of Lake Nipigon, was within 200 miles of it, and the distance is about the same from the Rat Portage. It is in the neighbourhood of Cat Lake. Here then we have objects worthy of a scientific ambition and of the energies of this young country, but requiring liberal expenditure and well-planned efforts, continued steadily, at least in the case of the first, for, perhaps, three or four years. Of objects more exclusively geographical, to which it may be hoped that this meeting may give a stimulus, I am inclined to give a prominent place to the exploration of that immense tract of seventy or eighty thousand square miles, lying east of the Athabasca river, which is still nearly a blank on our maps, and in connection with such future exploration, I cannot omit to mention that monument of philological research, the Dictionary of the Languages of the native Chipewyans, Hare Indians, and Loucheux, lately published by the Rev. E. Petitot. The lexicon is preceded by an introduction giving the result of many years' study among these people of the legends or traditions by which they account for their own origin. M. Petitot, who formerly was unconvinced of their remote Asiatic parentage, now finds abundant proof of it. But perhaps his most interesting conclusion is that in these living languages of the extreme north, we have not only the language of the *Nabajos*, one of the Apache tribes of Mexico, which has been remarked as linguistically distinct from the others, but also the primitive Aztec tongue, closely resembling the language of the Incas, the Quichua, still spoken in South America. I need not say how greatly these relations, if sustained by the conclusions of other students, are calculated to throw light upon the profoundly interesting question of the peopling of America.

5. This is perhaps a proper occasion to allude to a novel theory proposed about two years ago, with high official countenance, upon a subject which will never cease to have interest, and perhaps never be placed quite beyond dispute. I mean the landfall, as it is technically called, of Columbus, in 1492. The late Captain G. V. Fox, of the Admiralty, Washington, argued in a carefully prepared work, that Atwood's Key, erroneously called Samana on many charts, is the original Guanahani of Columbus, renamed by him S. Salvador, also that Crooked Island and Acklin Island are the Maria de la Concepcion of Columbus and the true Samana of succeeding navigators in the sixteenth century. The last supposition is unquestionably correct. Crooked, Acklin, and Fortune Islands, which from the narrowness of the channels dividing them may have been, and very probably were united four centuries ago, are plainly the Samana of the Dutch charts of the seventeenth century, and are so named on the excellent chart engraved in 1775 for Bryan Edwards' 'History of the West Indies,' but the view that Atwood's Key is identical with Guanahani is original, and is neither borne out by any old chart, nor by Columbus' description. This small island is conspicuously wanting in the one physical feature by which Guanahani is to be identified, "una laguna en medio muy grande." There is no lake or lagoon in it, nor does its distance from Samana tally at all with such slender particulars as have been left us by Columbus respecting his proceedings. The name S. Salvador has attached, not to Atwood's Key, but to Cat Island, one of the Bahamas; it is true that modern research has shifted it, but only to the next island, and on very good grounds. Cat Island is not *muy llana*, very level; on the con-

trary, it is the most hilly of all the Bahamas, and it has no lake or lagoon. Watling Island, a little to the south-east of Cat Island, and now generally recognised as the true Guanahani or S. Salvador, is very level; it has a large lagoon, it satisfies history as to the proceedings of Columbus for the two days following his discovery, by being very near the numerous islands of Exuma Sound, and I think few impartial persons can doubt the justice of the conclusion of the late Admiral Becher and of Mr. Major as to its identity; there are difficulties in the interpretation of Columbus' log on any hypothesis, but there is one little "undesigned coincidence" which to my mind goes far to carry conviction. Columbus, when he sighted land, was greatly in want of water, and he continued cruising about among the small islands in search of it for some days. Clearly, therefore, the *laguna* on Guanahani was not a fresh-water lake; nor is the lagoon on Watling Island fresh water, and so it exactly meets the case.

6. The report of Lieutenant Raymond P. Rodgers, of the United States Navy, on the state of the Canal Works at Panama so lately as January 25th last, which has doubtless been eagerly read by many present, leaves me little to say on that great enterprise. Perhaps the following official returns of the amount of excavation effected in cubic metres (a cubic metre is 1·308 cubic yards) will enable the audience to realise its progress:—

	Total excavated.	In each month.		Total excavated.	In each month.
1883. October ..	2,042,034		1884. January ..	3,340,534	580,000
November ..	2,375,534	333,300	February ..	3,974,191	633,657
December ..	2,760,534	385,000	March ..	4,590,022	615,831

The total quantity of excavation to be done in a length of 46·6 miles is estimated at 100 millions of cubic metres, but the rapid augmentation of quantity shows that the limit has not been attained. This is no place to speak of the stimulus given by this great work to mechanical invention or the gigantic power of the machines employed, which will probably receive attention in another Section, but I may mention the two great problems which still await solution. The first is how to deal with the waters of the river Chagres; the second is how to manage a cutting nearly 400 feet deep (110 m. to 120 m.). The Chagres is a river as large as the Seine, but subject to great fluctuations of volume; it cuts the line of the canal nearly at right angles, and for obvious reasons it is impossible to let it flow into it. It is proposed to arrest the stream by an enormous dyke at Gamboa, near the divide. It will cross a valley between two hills, and be 1050 yards long at the bottom, 2110 yards at the top, 110 yards thick at the base, and 147 feet in greatest height. Out of the reservoir so constructed it is proposed to lead the overflow by two artificial channels, partly utilising the old bed. The cutting will be nearly 500 feet wide at the top (150 m.), with sides at a slope of †. It is proposed to attack it by gangs or parties working on twelve different levels at the same time, one each side of the summit, dividing the width at each level into five parallel sections. Thus there will be 120 gangs at work together, and it is confidently hoped that the whole will be really finished in 1888, the date long since assigned for its completion by M. de Lesseps. There is practically no other project now competing with it: for the proposed routes by the Isthmus of Tehuantepec, the Atrato, and San Blav, may be regarded as almost universally given up; both the latter would involve the construction of ship tunnels on a scale to daunt the boldest engineer. The so-called Caledonia route has not stood the test of examination. There remains but the Nicaragua route, and this, while practicable enough, has failed to attract capitalists, and is environed by political and other difficulties, which would leave it, if completed, under many disadvantages as compared with its rival.

Among the latter must be named the necessity for rising by locks to the level of the Lake of Nicaragua (108 feet).

It is very tempting to speculate on the probable consequences of bringing the Hispano-Indian republics bordering on the Pacific into such early contact with the energies of the Old World, but these speculations belong to politics rather than geography; moral transformations, we know, are not effected so easily as the conquest over physical difficulties.

7. Let us now turn to another quarter. This meeting cannot fail to share the pride and satisfaction with which the Royal Geographical Society regards the execution by Mr. Joseph Thomson of the important missions intrusted to him last year, in East Africa, and to share my regret also, that he is not here to receive our plaudits and our congratulations. Mr. Thomson was commissioned to explore the unknown country about Mount Kilimanjaro and Mount Kenia, and if possible to continue his route to Lake Nyanza. He has done all this and much more. After an unsuccessful start from Zanzibar in March of last year, in which, however, he reached Kilimanjaro, and ascended it about 9000 feet, he returned to the coast from Taveta, and started again in July, this time from Mombasa. We are not yet fully acquainted with his route, but we know that he again reached the great mountain, reputed to have an elevation of more than 20,000 feet, that thence he reached the east side of Lake Nyanza, that he is the first who has stood on the shores of Lake Baringo. That thence, always among natives who had never before seen a white man, he reached Mount Kenia, reputed to be 18,000 feet high, and found his way back to the coast without any conflict or loss of life by violence, and this after a journey of about 500 miles, nearly the whole of it through a country previously unknown to geography. I have been favoured by him with a short communication which will be read presently. The courage and the temper, the decision and the tact required for successful progress among the warlike and rapacious tribes whose territories he passed through, are qualities which demand our genuine admiration. Take a single trait: "As an illustration of their readiness to draw their swords, I may mention," he says, "my own case, in which a Masai actually drew his *cimé* to settle matters with me, because getting tired of his extreme curiosity to see the whiteness of my leg, I pushed him away. On his drawing his *cimé* I laughed, and pretended I wanted to see it, and so the matter ended."

Before Mr. Thomson had actually returned to Zanzibar, another explorer, under the direction of a Committee of this Association, had started in the same direction. Mr. H. H. Johnston, whose plans, however, are devoted primarily to the investigation of the fauna and flora of Kilimanjaro, left the British Residency, Zanzibar, in May last for Mombasa, having by the advice of Sir John Kirk selected that route for Kilimanjaro. Mr. Johnston had succeeded with Sir John Kirk's kind assistance in getting together a well-organised party both of collectors and porters, and started in good health, with every hope of ultimate success. Further details on this subject will perhaps be given in the report of the Kilimanjaro committee to be read in Section D, and we have a communication from Sir John Kirk, dated July 10, to be read presently, which shows that he has reached his ground.

8. To the great desire of the French to unite their possessions in Northern and Central Africa, and to command the commerce of the native states south of the Sahara, we owe many important expeditions, one of which terminated unfortunately in the destruction of Colonel Flatters together with several other officers and men, by the Tuaregs in February 1881. Nevertheless, continued progress has been made in the completion of our maps of that region. Colonel Flatters found everywhere evidences that at some remote period the great Wadi Igharghar was the bed of a river flowing into one of the most westerly of the Tunisian depressions, that large

tracts were once fertilised by it, of which small and scattered oases alone have survived to our epoch, and that subterranean water probably exists along its course. The hand of man, which is about to admit the waters of the Mediterranean into those depressions, may yet work surprising changes in these arid regions. We have evidence of the improvements possible, in the description given by Mr. Oscar Lenz, of the young Arab city of Tenduf on the skirts of the desert (cir. 27° N.). Founded only thirty years ago, in the heart of Islam, he describes it as now consisting of large well-built houses surrounded with well-watered gardens of vegetables, and groves of date palms, a centre for caravan routes in four directions. This traveller, who visited Timbuktu in 1880, describes it as a decayed city of very little commercial importance, as may be imagined from their currency of cowries at the rate of 900 for a franc; and greatly in want of a little more intercourse with the world. The people, indeed, imagine their river, the Niger, to be identical with the Nile. The project of a railway thither from Algeria, actually marked on some maps, he dismisses as a chimera; the idea, however, has not been abandoned. The line now proposed is from Wargla by Insalah and Inzize to Timbuktu.

I am tempted here to remark that French travellers have made one observation which is far from being a matter of concern to them alone. They dwell with emphasis on the probable consequences of the rapid progress of the religion of Mahommed among the African races of the northern equatorial zone. Native tribes, hitherto without moral or political cohesion, are being knit together on the Western Sudan, the Upper Niger, and the Gambia, with a rapidity which endangers the peaceful advance of European commerce. It is, of course, to be expected that this movement will in time reach the populous basin of the Congo, and we have had too recent evidence of the fanaticism it is capable of inspiring, not to perceive here a moral element which may greatly affect white settlements and missionary enterprise in Central Africa hereafter. Any political changes which would substitute larger units of territory, and definite boundaries, and permanent names, for the present fleeting landmarks and multiplied tribal designations which confuse our maps, would in one sense be welcome. In the meantime Central African exploration is daily revealing to us the unsuspected wealth of that Dark Continent in all that can fit it for destinies more noble than it has yet been called to fulfil.

9. Although the Upper Congo from Stanley Falls to Stanley Pool has now been so often travelled that it may be regarded as pretty well known, this by no means excludes the possibility of many geographical corrections. For instance, a map issued as lately as July 1883, by the International Congo Association, lays down its lower course between the equator and 4° south latitude, nearly 100 miles more to the west than is shown in the best modern atlas. As regards its tributaries, much remains to be learned. Mr. Stanley has discovered two new lakes. The labours of that energetic traveller, M. de Brazza, have, to a great extent, cleared up the geography of the region included between the Congo and the Ogowé from the equator southwards, and there are now said to be twenty-two trading stations in this part of the country; we are not informed what commerce exists. Higher up, but still to the north, Mr. Stanley has ascended the Aruwimi about 100 miles, without having solved a question of no little interest, namely, whether it is identical with the Wellé, and takes its rise in the same watershed which feeds the White Nile, or whether we have not, beyond its sources, a drainage system as yet untraced, but which may connect together a number of rivers whose relations to one another and whose final outlet are alike unknown. Lupton Bey reported nearly two years ago that a very large lake had been visited by one of his native subordinates west of the Aruwimi, and it is, in his opinion, probable that the Wellé flows into it.

The southern basin of the Congo has been crossed from Loanda to Nyangwé

through a new country by the late Dr. Pogge and Lieutenant Wissmann, the latter of whom has inscribed his name on the roll of great African travellers by continuing his journey across the continent by way of Tabora, or Unyanyembe, to Zanzibar. It is worthy of note that he brings confirmation of the often reported existence of a dwarfish race, the Watwa, on the upper waters of the Sankuru, not a new fact in African ethnography, because we have long been familiar with the diminutive Bushmen of the Cape of Good Hope; but interesting, like the fair-complexioned natives seen by Stanley and Johnston, as evidence of the diversities of origin, character, and capabilities, which better acquaintance with the African people is likely to disclose, and which has at all times been a potent factor in human progress. It is scarcely necessary to refer here to the laborious work of Mr. Cust on the Modern Languages of Africa as a treasury of information. It may be said in military phrase that the east and west of Africa are in touch. Stanley was able to despatch letters in December last, via Nyangwé, to Karema from his most easterly station on the island of *Wana-Rusani*, Stanley Falls. We can better appreciate the teeming life of these equatorial regions, when we read that his little expedition of three steam launches encountered, on November 24th last, a flotilla of over a thousand canoes (*plus de mille canots*), which had just before devastated the village of Mawembé, murdering all the men, and carrying off the women and children into slavery. They did not molest him, and all up this great river the natives, with few exceptions, were found on this last occasion eager to contract alliances (ratified by the exchange of blood), desirous of his protection, and craving a white resident to instruct them.

Proceeding southward to the region claimed especially as their own by Portuguese travellers, Messrs. Britto Capello and Ivens, who successfully reached the Upper Quango in 1878, returned last January to Loanda with the intention, it is said, of endeavouring to descend one of the great tributaries, of which there are four whose sources have been crossed at a great elevation by Cameron and others, but whose course for about 1000 miles has never been followed: they are now on the Kunene. An English sportsman, Mr. Hemmings, starting from Walfisch Bay, has quite recently, in company with a Dutch hunter, found his way partly through the Portuguese territories, partly through native states beyond their boundaries, to the Congo, which he struck at Vivi. Cameron, it will be remembered, was astonished by a cold of 38° F. on the watershed between the Zambezi and the Kassabé in about 12° south latitude. Dr. Pogge compares the climate of Musumba on the 8th parallel, in the month of December, to that of North Germany, and the fact illustrates what we learn from so many other quarters, that much of the interior of Africa belongs, by reason of its elevation above the sea, to a far more temperate zone, and is better suited to the European constitution than its geographical position promises. The terrible prevalence of fever which has cost so many lives, will probably be mitigated in time and by improved accommodation. The hills are comparatively free from it. Having alluded to Dr. Paul Pogge, whose death at Loanda in March last deprives geography of an adventurous explorer, I may add that the account of his journey in 1875 to Musumba, the capital of the powerful negro kingdom of the Muata Yanvo, or Matianvo of Livingstone, published in 1880, remains to be translated. That great traveller failed to reach it. Cameron crossed the territory, but a long way to the south of it, and no previous scientific traveller, that I am aware of, has described it. Dr. Pogge resided there four or five months, and we learn many interesting particulars from him, and from Dr. Max Buchner, a subsequent traveller. The people, although Fetish worshippers, practise the rite of circumcision: they are a fine, warlike race, unhappily addicted to slave hunting, but far in advance of their cannibal neighbours of Kauanda. Their institutions are of a feudal character: Muata Yanvo is an hereditary title. Among many peculiar customs is

one which invests one of the king's half-sisters, under the designation of the Lukoksha, with the second authority in the kingdom. She is forbidden to marry, but permitted a sort of morganatic alliance with a slave, any offspring being ruthlessly destroyed, and on the death of the king she has the principal voice in determining his successor, who, however, must be selected from among the sons of the late king. Since Dr. Pogge's visit the Muata Yanvo has been deposed and poisoned by his Lukoksha. The extraordinary custom prevails here that a man's children do not belong to him, but to the eldest brother of their mother, and should a child die the father must make compensation. Surely I have now justified the remark I made above on human perversities.

10. As many of my hearers may not be fully aware of the rapid extension of white occupation, hardly as yet to be called settlement, in Central Africa, and of the early fruit borne by the heroic life and death of Livingstone, and other scarcely less devoted travellers and philanthropists, and as many of the places are not to be found in any ordinary atlas, I give at the end a table as complete as I have been able to make it, of actual centres of communication or trade, or missionary instruction now established there. Lake Nyassa, we are told, is becoming a busy inland sea. There are two steamers upon it, and one on the river Shiré; upon Tanganyika three. Many years cannot elapse before the primitive and costly practice of carrying goods by an army of porters will be a thing of the past, when pack animals, perhaps wheeled vehicles, will have replaced them. Donkeys have been already introduced, with good promise, by the Universities' missionaries and the African Lakes Company, although they have not been a success on the Congo. That first necessity of civilisation, a road of some sort, will connect the petty capitals, and link in friendly communication tribes which know one another now chiefly by hostilities and reprisals. The African Lakes Company, of Glasgow, has ten small depôts between Quillimane and Malawanda on Lake Nyassa, and from this place a practicable road of 220 miles has been carried to Pambete, on Lake Tanganyika. Those places are likely to become the first centres of trade at which the natives have already learned to respect the white man, where there are residents who have mastered their language, and where native interpreters are to be found. Believing, then, that social problems of no common degree of complexity are certain to arise in a few years from the conflict of many creeds and nationalities, in a sort of "no man's land," the table I subjoin may assist those who desire to have a definite idea of the progress already made. I am bound to add that "no man's land" is a phrase which only expresses European views. The natives have very definite territorial ideas.

11. From Central Africa it is not an unnatural transition to Central Asia, the region next the most inaccessible, and pregnant, perhaps, with greater events. The Russian project for diverting the Oxus or Amu Darya from the Sea of Aral into the Caspian, remains under investigation. We learn from the lively account of Mr. George Kennan, a recent American traveller, that there is more than one motive for undertaking this great work, if it shall prove practicable. He states that the lowering of the level of the Caspian Sea, in consequence of the great evaporation from its surface, is occasioning the Russian Government great anxiety, that the level is steadily but slowly falling, notwithstanding the enormous quantity of water poured in by the Volga, the Ural, and other rivers. In fact, Colonel Vinukof says that the Caspian is drying up fast, and that the fresh-water seals, which form so curious a feature of its fauna, are fast diminishing in number. At first view there would not appear great difficulty in restoring water communication, the point where the river would be diverted being about 216 feet above the Caspian; but accurate levelling has shown considerable depressions in the intervening tract. As the question is one of great

geographical interest we may devote a few minutes to it. It is not to be doubted that the Oxus, or a branch of it, once flowed into the Caspian Sea. Professor R. Lentz, of the Russian Académie Impériale des Sciences, sums up his investigation of ancient authorities by affirming that there is no satisfactory evidence of its ever having done so before the year 1320; passages which have been quoted from Arab writers of the ninth century only prove in his opinion that they did not discriminate between the Caspian Sea and the Sea of Aral. There is evidence that in the thirteenth and fourteenth centuries the river bifurcated, and one branch found its way to the Caspian, but probably ceased to do so in the sixteenth century. This agrees with Turkoman traditions. Even so late as 1869 the waters of the Oxus reached Lake Sara Kamysh, 80 or 90 miles from their channel, in a great flood, as happened also in 1850, but Sara Kamysh is now some 49 feet lower than the Caspian, and before they could proceed further an immense basin must be filled. The difficulties then of the restoration by artificial means of a communication which natural causes have cut off, are (a) the disappearance of the old bed, which cannot be traced at all over part of the way; (b) the possibility that further natural changes, such as have taken place on the Syr-Daria, may defeat the object; (c) the immense expenditure under any circumstances necessary, the distance being about 350 miles, which would be out of all proportion to any immediate commercial benefit to be expected. We may very safely conclude that the thing will not be done, nor is it at all probable that Russian finances will permit the alternative proposal of cutting a purely artificial canal by the shortest line, at an estimated expense of 15 to 20 million roubles.

We have had, I think, no news of the intrepid Russian traveller, Colonel Prejevalsky, who started from Kiakhta on November 20th, of later date than January 20th, when he had reached Alashan, north of the Great Wall. He had for the third time crossed the great Desert of Gobi, where he experienced a temperature below the freezing point of mercury, and was to start for Lake Kuku-nor (+ 10,500 feet) the following day, thence to proceed to Tsaidam, where he proposed to form a *dépôt* of stores and provisions, and leaving some of his party here, to endeavour to reach the sources of the Yang-tse-kiang, or Yellow River. It was his intention to devote the early part of the present summer to exploration of the Sefani country, situated between Kuku-nor to the north and Batan to the south—a country likely to yield an abundant harvest of novelty in natural history—afterwards to transfer his party to Hast, in Western Tsaidam, which may be reached next spring. From this point the expedition will endeavour first to explore Northern Tibet, which is his main object, in the direction of Lhasa and Lake Tengri-nor, and then returning northward, cross the Tibet plateau by new routes to Lake Lob-nor. After the re-assembly of the expedition at this point, it will probably regain Russian territory at Issyk-kul. Colonel Prejevalsky is accompanied by two officers, an interpreter, and an escort of twenty Cossacks.

12. As you are aware, we have been chiefly indebted to natives of India for several years past for our knowledge of the regions beyond the British boundary. Mr. McNair, of the Indian Survey department, who received the Murchison premium of this year, is the first European who has ever penetrated so far as Chitral, which is only 200 miles from Peshawur. In various disguises, however, natives, carefully instructed, have penetrated the neighbouring but unneighbourly regions of Afghanistan, Kashmir, Turkistan, Nepal, Tibet—in almost every direction—and these achievements were crowned by one of them, known as A-k, reaching Saitu or Sachu, in Mongolia, in 1882, and thence returning in safety to India, after an absence of four years. His route took him to Darchendo or Tachialo (lat. 31°), the most westerly point reached by the late Captain J. Gill, R.E., in 1877, and thus connects the explorations of that accomplished and lamented traveller with Central Asia. A-k

has brought fresh evidence that the Sanpoo and the Brahmapootra are one; the quite modern opinion that the former flows into the Irrawaddy being shown to be groundless. After draining the northern slopes of the Himalayas, the Brahmapootra makes a loop round their eastern flanks where it has been called the Dehang, and thence, as everybody knows, flows westerly to join the Ganges: the maps have been shown in this instance to be right. The travels of these native explorers, their stratagems and their disguises, their hazards and sufferings, their frequent hair-breadth escapes, are teeming with excitement. One of them describes a portion of his track at the back of Mount Everest, as carried for the third of a mile along the face of a precipice at the height of 1500 feet above the Bhotia-kosi river, upon iron pegs let into the face of the rock, the path being formed by bars of iron and slabs of stone stretching from peg to peg, in no place more than 18 inches and often not more than 9 inches wide. Nevertheless this path is constantly used by men carrying burdens.

One of the finest feats of mountaineering on record was performed last year by Mr. W. W. Graham, who reached an elevation of 23,500 feet in the Himalayas, about 2900 feet above the summit of Chimborazo, whose ascent by Mr. Whymper in 1880, marked an epoch in these exploits. Mr. Graham was accompanied by an officer of the Swiss army, an experienced mountaineer, and by a professional Swiss guide. They ascended Kabru, a mountain visible from Darjeeling, lying to the west of Kanchinjunga, whose summit still defies the strength of man.

13. And here I may refer to that great work, the Trigonometrical Survey of India. The primary triangulation, commenced in the year 1800, is practically completed, although a little work remains to extend it to Ceylon on one side and to Siam on the other. Much secondary triangulation remains to be executed, but chiefly outside the limits of India proper. The Pisgah views, by which some of the loftiest mountains in the world have been fixed in position, sometimes from points in the nearest Himalayas, 120 miles distant, only serve to arouse a warmer desire for unrestrained access. The belief long entertained that a summit loftier than Mount Everest exists in Tibet is by no means extinct, but it is possible that the snowy peak intended may prove eventually to be the Mount Everest itself of the original survey. Still, however, science, in spite of fanatical obstruction, makes sure advances. The extraordinary learning and research by which Sir H. Rawlinson was enabled a few years since to expose a series of mystifications or falsifications relating to the Upper Oxus, which had been received on high geographical authority, can never be forgotten. That river has now been traced from its sources in the Panjah, chiefly by native explorers, and to them we may be said to be indebted for all we know of Nepaul, from which Europeans are as jealously excluded as they are from the wildest Central Asian Khanate, although Nepaul is not so far from Calcutta as Kingston is from Quebec.

Carrying their instruments to the most remote and inaccessible places, and among the most primitive hill tribes, the narrative reports of the officers of the Indian Survey are full of ethnographic and other curious information. Take for example the account given by Mr. G. A. McGill, in 1882, of the Bishnoies of Rajpūtana, a class of people, he says, who live by themselves, and are seldom to be found in the same village with the other castes. "These people hold sacred everything animate and inanimate, carrying this belief so far that they never even cut down a green tree; they also do all in their power to prevent others from doing the same, and this is why they live apart from other people, so as not to witness the taking of life. The Bishnoies, unlike the rest of the inhabitants, strictly avoid drink, smoking and eating opium; this being prohibited to them by their religion. They are also stringently enjoined to monogamy and to the performance of regular ablutions daily. Under all these circumstances, and as may be expected, the Bish-

noies are a well-to-do community, but are abhorred by the other people, especially as by their domestic and frugal habits they soon get rich, and are the owners of the best lands in the country."

In one particular, the experience of the Indian Survey carries a lesson to this country. "A constantly growing demand," says General Walker, "has arisen of late years for new surveys on a large scale, in supersession of the small-scale surveys which were executed a generation or more ago. . . . The so-called topographical surveys of those days were in reality geographical reconnaissances sufficient for all the requirements of the Indian atlas, and for general reproduction on small scales, but not for purposes which demand accurate delineation of minute detail." We have in the Canadian North-West a region which has not yet passed beyond the preliminary stage, and it would probably be possible to save much future expenditure by timely adoption of the more rigorous system. There is perhaps no region on the globe which offers conditions more favourable for geodesy than the long stretch of the western plains, or where the highest problems are more likely to present themselves in relation to the form and density of the earth. The American surveyors have already measured a trigonometrical base of about 10·86 miles in the Sacramento Valley, the longest I believe as yet measured in any country (the Yolo Base) and reported to be one of the most accurate.

14. The Australian continent has been crossed again from east to west, on the parallel of 28° south or thereabouts, by Mr. W. Whitfield Mills. Starting from Beltana, near Lake Torrens, S.A., on June 6th, 1883, and travelling almost due west, he finally reached the coast at Northampton, W.A., in January last, after great suffering from want of water. But for the introduction of camels, the expedition must have broken down. On one occasion they were eleven or twelve days without water. He reports a great extent of available pasturage between the Warburton range and the Blyth watershed; but he found only three perennial sources of water supply in 1600 miles; such conditions give more than usual interest to the recent discovery that subterranean supplies may be expected all over a cretaceous area estimated at 126,000 square miles in the central region of the Australian continent. Good water was struck in April last by an artesian boring at a depth of 1220 feet at Turkannina, lat. 30° S., long. 138½° E. It is difficult to overrate the importance of this discovery, the supply being very abundant, and not likely to fail, since its sources are believed by Mr. Brown, the Government geologist, to be derived from the rainfall of the southern watershed of the Queensland and Northern ranges.

Mr. Mills started with thirty camels, attended by five Afghan drivers; six of them died from the effects, as was supposed, of eating poisonous herbage. Mr. Mills did not deviate much from the tracks of the late Mr. W. C. Gosse, and of Mr. J. Forrest, his journey has therefore added little to previous geographical knowledge, but it has helped to make the route better known, and afforded fresh evidence that the value of the camel in those terrible Australian Saharas is in no degree less than it is where he has long been known as the "ship of the desert."

Another traveller, Mr. C. Winnecke, starting from the Cowarie station on the Warburton river, in 28° S., has traversed about 400 miles of new country in a northerly direction, and made a sketch map of 40,000 square miles, up to Goyders Pillars, a remarkable natural feature in the Tarleton range. He too owed his success to the employment of camels, which he describes as "behaving nobly." The recent establishment of a Geographical Society of Australasia promises that many adventurous private explorations, little known and soon forgotten, will hereafter contribute to a better knowledge of that vast interior.

The reported outbreak of a new volcano in the northern part of West Australia, on August 25th, 1883, in connection with the great eruption of the Sunda Straits,

has not, as far as I know, been verified; but the graphic description of the natives: "Big mountain burn up. He big one sick. Throw him up red stuff, it run down side and burn down grass and trees,"* seems to leave little doubt of the reality of the occurrence.

15. The International Circumpolar expeditions have added, perhaps, to local knowledge, especially as regards the climate and means of supporting life at various stations; but not much, so far as reported, to geography generally. To this remark, however, a brilliant exception must be made, on the intelligence flashed through the telegraph while these lines are passing through the press. The distinction of the nearest approach to the North Pole yet made by man has been won by the late Lieutenant Lockwood and Sergeant Brainerd, of Lieutenant Greeley's expedition. They reached, on May 13th, 1882, an island not before known, in lat. $83^{\circ} 24' N.$, long. $44^{\circ} 5' W.$, now named after its discoverer. This is four or five miles beyond Captain Markham's furthest point ($83^{\circ} 20' N.$), and it appears to be by no means the only geographical achievement which in some measure rewards the painful sufferings and losses of the party. Lieutenant H. P. Ray, U.S.A., has also rectified many details of the map about Point Barrow, and discovered a range of hills which he has named the Meade Mountains, running east from Cape Lisburne, from which at least two streams, unmarked, flow into the Polar Sea. We may expect similar service from the Italian parties at Patagonia, and from the Germans in South Georgia.

16. There are few particulars in which the best atlases of the present day differ more from those published twenty-five years ago, than in the information they give us respecting the submerged portions of the globe. The British Islands, with the 50 and 100-fathom lines of soundings drawn round them, seem to bear a different relation to each other and to the Continent than they did before. The geography of the bed of the ocean is scarcely less interesting than that of the continents, or less important to a knowledge of terrestrial physics. Since the celebrated voyage of H.M.S. *Challenger*, no marine researches have been more fruitful of results than those of the *Talisman* and the *Dacia*. The first was employed last year by the French Government to examine the Atlantic coasts from Rochefort to Senegal, and to investigate the hydrography and natural history of the Cape Verde, Canary, and Azores archipelagos. The other ship, with her companion the *International*, was a private adventure, with the commercial purpose of ascertaining the best line for a submarine telegraph from Spain to the Canaries. These two last made some 550 soundings, and discovered three shoals, one of them with less than 50 fathoms of water over it, between the continent of Africa and the islands. If we draw a circle passing through Cape Mogador, Teneriffe, and Funchal, its centre will mark very nearly this submarine elevation; the other two lie to the north of it. The *Talisman* found in mid-ocean but 1640 fathoms, among soundings previously set down as over 2000 fathoms. Our knowledge then of the bed of the Atlantic, and of the changes of depth it may be undergoing, is but in its infancy; and we have only to reflect what sort of orographic map of Europe we could hope to draw, by sounding lines dropped a hundred miles apart from the highest clouds, to be conscious of its imperfection. But this knowledge is accumulating, and whether revealing at one moment a profound abyss, or at another an unsuspected summit; marvels of life, form, and colour, or new and pregnant facts of distribution; it promises for a long time to come to furnish inexhaustible interest.

17. If railways are features of a less purely geographical interest than the great

* 'Nature,' February 21, 1884.

interoceanic canals which dissever continents, they are not less important to the traveller; and whether commercial, political, or strategic motives have most influenced their construction, they not less fulfil the beneficent purpose of binding men in closer ties. It is not necessary that I should speak to you of the Canada Pacific Railway, of which many of my hearers will soon have personal knowledge, or of the proposed railway from Winnipeg to Hudson's Bay; there are numerous other undertakings which serve in an equal degree to mark this nineteenth century as the mother of new forces and new possibilities. The Mexican Central Railway open some time since from El Paso on the River Grande, to Jimenez, has been opened to Mexico itself, and will soon reach Tehuantepec, which will thus be placed in direct railway communication with New Orleans, while the Sonoran branch will connect the United States with Guaymas on the Gulf of California. It requires a moment's recollection of the events we have seen in our own day to appreciate the vastness of these changes.

In South America we have the railway of Dom Pedro II. creeping on towards Paraguay and the Argentine Republic. It has reached Sorocaba, while branches from S. Paolo to the north-west approach great tracts on the Parana and Pazamapanama, which are marked on the latest Brazilian maps as "unknown Indian territories," perhaps 100,000 square miles in extent, cut by the tropic, but contributing almost nothing as yet to commerce.

Turning to Africa, the French have a short railway in operation on the Senegal, from Dakar to S. Louis, and a section of a line to Medina opened. French engineers also are engaged on a railway from Enzeti to Teheran, so that before long the capital of Persia will be reached from London in little more than a week.

Looking to the far East, Russia has long since made the shores of the Caspian nearly as accessible as Lake Superior, by her railway from Batoum, by way of Tifis to Baku, which will also be reached by the lines from Moscow before long. This is but the first section of a line of far more ambitious aims. Starting again from Mikhailovsk, the embouchure of the ancient Oxus, the Trans-Caspian branch has been extended to Bami, and the line has been surveyed to Herat. The political forces in the field may be safely trusted to bring the British Indian lines, at present laid out to Quetta (800 miles from Herat) into a more or less direct communication with the same terminus. These are forces which we cannot ignore, but all we have to do with them here is to recognise, behind their smoke and din, the steady advance of our race in its primeval mission to replenish the earth and subdue it. The next step on the British side is an extension of the railway from Quetta to Candahar, a work which was commenced by a former administration but discontinued. Its completion can bring nothing but benefit to the Ameer and his people.

18. The science of geography reaches perhaps its highest point of public utility when it determines on a sure basis the international disputes ever arising on questions of boundary. Sacred as our neighbour's landmarks are, or ought to be, to us, they are in many cases so ill or incorrectly defined as to give free scope to the passion of aggrandisement. In such a state is the frontier of Afghanistan, between the rivers Tejend and Amu Darya. In such a state, from the Treaty of Ghent to the Treaty of Washington, were the frontiers of this Dominion and are still those of Ontario and Manitoba. In such a state are the frontiers of British Guiana, which have been in dispute for many years with the Republic of Venezuela on the one side, and the Empire of Brazil on the other, both basing their claims on vague rights of the old Spanish crown. To some extent the question as to the original boundaries of the possessions claimed by Portugal in West Africa, including the mouth of the Congo, belongs to the same category. The ambiguity arises more frequently from defective maps and the consequent imperfect geographical know-

ledge of the statesmen negotiating treaties, than from any other cause, and all that I dwell upon here is the proof so often afforded that liberal, even large expenditure, in the encouragement of scientific exploration, especially of frontier lands, would often prove to be true public economy in the end.

19. I have now touched lightly upon all the points which appear to me to be most noticeable in the recent progress of geographical science; but before I resume my seat I cannot deny myself the pleasure of alluding to that important measure of social reform, so simple in its application, so scientific in its basis, for which you are indebted to the perseverance and enthusiasm of my friend Mr. Sandford Fleming, c.e. I mean, of course, the agreement to refer local time on this continent to a succession of first meridians, one hour apart. There are many red-letter days in the almanac of less importance than that memorable November 18th, 1883, which saw this system adopted, whether we consider its educational tendency or its influence on the future intercourse of unborn millions. It is a somewhat memorable evidence also that agreement upon questions of general concern is not that unattainable thing which we are apt to consider it. The next step will not be long delayed: that is, the agreement of the civilised world to use one first meridian, Paris, Ferrol, Washington, Rio de Janeiro, gracefully, as I venture to hope, giving that precedence to Greenwich which is demanded by the fact that an overwhelming proportion of the existing nautical charts of all nations, and of maps and atlases in most of them, already refer their longitudes to that meridian; no other change would be so easy or so little felt.

APPENDIX TO GEOGRAPHICAL ADDRESS.

List of Stations occupied by Europeans in Central Africa in 1884.

[This list has been compiled from the latest reports of the Belgian International Association and of the various Missionary Societies, extended by information communicated by that eminent African scholar and linguist, Mr. Robert Needham Cust. The latitudes and longitudes on the Eastern Section are chiefly from Mr. Ravenstein's maps, and in many instances are but an approximation. There are probably a few small out-stations not included, and possibly some of the places named are practically identical with others, as Kiinua-Mgua and Mkunazini, which are mission schools at Zanzibar belonging to Mwembe.]

ABBREVIATIONS EMPLOYED.

A. L. Co.	African Lakes Company of Glasgow.	F. P. M.	French Protestant Mission (Arnot's).
A. B. M. U. . . .	American Baptist Missionary Union.	G. A. Assoc. . .	German African Association.
A. B. F. M. . . .	American Board of Foreign Missions.	J.	Jesuits, English and French.
A. P. M.	American Presbyterian Mission.	L. I. M.	Livingstone Inland Mission.
B. M.	Baptist Missions (British)	L. M. Soc. . . .	London Missionary Society.
C. M. Soc.	Church Missionary Society of London.	N. D. d'A. . . .	Notre Dame d'Afrique d'Alger.
B. I. Assoc. . . .	Belgian International Association.	S. Esprit	Pères du Saint Esprit.
E. C. S.	Established Church of Scotland Mission.	S. Cœur de M. .	Pères du Sacré Cœur de Marie.
F. C. S.	Free Church of Scotland Mission.	U. M. M.	United Methodist Mission.
F. E. M.	French Evangelical Mission.	U. M.	Universities' Mission.

I.—EAST OF LONGITUDE 25° E. FROM THE EQUATOR TO THE ZAMBESI

Stations in italics are understood to be given up.

Place.	State.	Lat.	Long.	Organisation.
Rubaga	N. of Victoria } Nyanza	— 0 18	32 37	C. M. Soc. <i>Capital of King Mtesu.</i>
Bukumbi	On Victoria N. }	<i>cir.</i> 2 0	32 0	N. D. d'A.
Kagehy	"	2 22	33 17	C. M. Soc.
<i>M'Salata</i>	"	2 40	33 0	C. M. Soc.
Lamu	E. Coast	2 17	41 0	U. M. M.
Teita	Teita Country	3 50	38 35	C. M. Soc.
Kamlikeni	Giriyama	3 30	39 39	C. M. Soc.
Kisulutini	Alupanga	3 55	39 33	C. M. Soc.
Rabbai	"	3 57	39 37	U. M. M.
Ruwima (Sawje)	L. Tanganyika	4 3	29 22	N. D. d'A.
Mombasa Island	East Coast	4 4	39 40	C. M. Soc.
Kisauue (Frere-town)	Near Mombasa	4 2	39 43	C. M. Soc.
Jomva or Jomfu	"	4 0	39 36	U. M. M.
Shimba	"	4 15	39 30	C. M. Soc.
Urambo	U'Nyamwezi	4 35	32 23	L. M. S.
Ujiji	L. Tanganyika	4 55	30 0	C. M. Soc.
Uyubi	"	4 57	33 8	C. M. Soc.
Tabora	U'nyanyembe	5 0	33 2	N. D. d'A.
Mkuzi	U'Sambara	5 12	38 49	U. M., 15 miles from Magila.
Magila	"	5 9	38 45	U. Medical Mission, 80 miles from Zanzibar.
Misozwe	"	<i>cir.</i> 5 0	38 0	U. M., 8 miles from Magila.
Umba, or Ambe	"	5 10	38 53	U. M., 12 miles from Magila.
Mtowe or Plymouth Rock	U'Guha, L. Tanganyika }	5 45	29 30	L. M. Soc.
Kakoma	U'Ganda	5 47	32 28	Belgian International.
Mhonda	Nguru	6 0	37 30	S. E. and S. Cœur de M.
Saadani	Uzegura	6 4	38 50	Belgian International.
Kiungani	Zanzibar Island	6 10	39 14	U. M. School.
Kiinua Mgua	"	"	"	U. M. School.
Mkunazini	"	6 12	39 12	U. Mission Farm.
Mbweni	"	6 16	36 58	C. M. Soc.
Mamboia	U'Sagara	6 22	36 22	C. M. Soc.
Mpapwa	U'Sagara	6 20	36 16	C. M. Soc.
Kisokwe	"	6 15	36 15	S. E. and S. Cœur de M.
Mrogoro	"	6 25	38 55	S. E. and S. Cœur de M.
Begamoyo	Near Zanzibar	6 50	32 0	Belgian International.
KAREMA	L. Tanganyika	6 50	32 0	Belgian International.
Condoa	U'Sagara	6 52	36 55	G.-A. Assoc.
Lundwe, or Liendwe	L. Tanganyika	8 45	31 0	L. M. Soc.
Maliwanda	W. of L. Nyassa	9 42	33 30	F. C. of S. and A. L. Co.
Karongas	On L. Nyauza	9 57	33 53	A. L. Co. Store.
Mtua	Rovuma	10 10	39 30	U. M. <i>Abdallah Pisa's residence.</i>
Lindi	East Coast	10 0	39 45	U. M. <i>Vice-Consul Smith's residence.</i>
Gwangwura	L. Nyassa	10 30	35 30	"
Gwangwara	"	"	"	Belgian International.
Masasi	Inland Station	10 48	38 55	U. M.
Newala	Rovuma	10 57	39 13	U. M., <i>about 40 miles S.E. of Masasi.</i>
M. Wambe	L. Nyassa	11 35	35 20	U. M.
Mombra	L. Nyassa, A-Ngoni-land }	11 30	31 0	F. C. S. above Bandawé.

TABLE I.—continued.

Place.	State.	Lat.	Long.	Organisation.
Bandawé (<i>New Livingstonia</i>) ..	L. Nyassa ..	11 54	34 5	F. C. S., Livingstonia Mission, and A. L. Co. U. M. E. C. of S. <i>Consul Footé's residence.</i>
Chitegi's	" ..	12 10	34 48	
Blantyre	E. of R. Shiré	13 45	34 57	
Cape Maclear (<i>Old Livingstonia</i>) ..	L. Nyassa ..	14 3	34 44	F. C. of S.
Matope	On the Shiré ..	15 22	34 55	A. L. Co., <i>a road hence to below the Murchison rapids on the Shiré.</i>
Mangala	R. Shiré	16 0	35 0	A. L. Co. Stores.
Tette (Nyungwe)	Zambesi	16 9	33 28	Jesuit Mission.
Lialui	Zambesi .. <i>cir.</i>	15 30	23 15	F. P. M.
Sheeheke	Zambesi	17 31	24 55	St. J. also F. E. M.
Mosangu (Mwemba's) ..	Zambesi	17 45	27 45	Jesuit.
Victoria Falls ..	Zambesi	17 55	25 50	French Protestant.
Quilimane, or Kilimani	East Coast ..	18 0	37 0	Jesuit.
Mopea	Zambesi	18 0	36 0	"
Panda Ma Tenka	S. of Zambesi..	18 30	25 55	"

II.—WEST OF LONGITUDE 25° E. FROM THE EQUATOR TO THE KUIMÉN OR CUNENÉ.

Island of Wana Rusani	Stanley Falls ..	+ 0 10	25 0	B. I. Assoc.
Equator Station L	Upper Congo ..	+ 0 6	18 50	B. I. Assoc. and B. M., 700 miles from the coast.
Lukolela .. L	" ..	1 22	17 7	B. I. Assoc. and B. M.
Leona L	" ..	1 10	17 0	M. de Brazza.
Bolobo L	" ..	2 22	17 45	B. I. Assoc.
Misnata L	" ..	3 28	17 30	B. I. Assoc.
Misongo L	N'Kutu R. ..	3 20	17 40	L. I. M.
Qua'mouth .. L	Kwango R. ..	3 15	16 42	B. I. Assoc.
Qua'mouth	" ..	3 24	16 28	B. I. Assoc.
M' Gaucho .. R	" ..	3 20	16 40	M. de Brazza.
Brazzaville (Mfwa) .. R	Stanley Pool ..	4 10	15 41	French Establishm.
Leopoldville .. L	" ..	4 13	15 38	B. I. Assoc. and L. I. M.
Kimboko(Arthington) L	" S.W.	4 9	15 50	B. M.
Kintohassa .. L	" ..	4 12	15 47	B. I. Assoc.
N'Gombi L	" ..	4 49	15 22	B. M.
Liverpool .. ..	" ..	..	..	Late B. M.
Luteto	" ..	4 49	15 10	B. I. Assoc.
Banza Manteka L	" ..	5 24	14 13	L. I. M.
Manyanga (N. N'Gombi's town) L	" ..	4 39	14 52	B. I. Assoc. and late L. M.
Lukungu	" ..	4 50	14 53	L. I. M.
Isanghila .. R	" ..	5 13	14 12	B. I. Assoc.
Mukimbungu L	" ..	5 8	14 26	L. I. M.
Bayneston .. L	" ..	5 13	14 13	B. M.
Vivi R	" ..	5 37	13 53	B. I. Assoc.
Palabella L	" ..	5 34	14 3	L. I. M.
Ikungula	" ..	5 42	13 45	B. I. Assoc.
Underhill (Wanga-Wanga)	Lower Congo ..	5 38	13 42	B. M.
Nokki or Noqui L	" ..	5 42	13 43	B. I. Assoc.

TABLE II.—*continued.*

Place.	State.	Lat.	Long.	Organisation.
M' Boma, or Boma } R	Lower Congo ..	5 44	13 3	B. I. Assoc.
Ianana Point ..	"	6 0	12 12	L. I. M.
Mukimvika ..	L S. of Congo ..	6 11	12 18	L. I. M.
Franceville ..	R. Passa	1 30	13 50	French settlement.
Franktown ..	R. Kwilu	3 30	12 45	B. I. Assoc.
Stanley Niadi ..	Kwilu District	3 51	13 3	B. I. Assoc.
Baudouville ..	"	4 8	12 0	B. I. Assoc.
Stephanieville ..	"	4 10	13 14	B. I. Assoc.
Philipville ..	"	4 18	13 43	B. I. Assoc.
Nkula	"	4 32	18 4	B. I. Assoc.
Bulangungu ..	"	4 38	14 30	B. I. Assoc.
M. Boko songho ..	"	5 0	13 43	B. I. Assoc.
San Salvador ..	Congo	6 18	14 46	Late B. M.
Rudolfstadt ..	Coast	4 29	11 42	B. I. Assoc.
Grantville ..	Coast	4 35	11 46	B. I. Assoc.
Nengeneuge ..	{ 70 miles up } Gambia	13 0	16 0W	A. P. M.
Benito	Bight of Biafra	2 0	9 45	A. P. M.
Corisco, Island of	"	1 20	9 45	A. P. M.
Baraka	Near Libreville	1 30	9 30	A. P. M.
Libreville ..	Gaboon	1 30	9 30	S. Esprit.
Kangwe	S. of Ogowe ..	1 0	10 0	A. P. M.
Tallaguga ..	{ 235 miles up } Ogowe	0 10	11 50E	A. P. M.
St. Fr. Xavier ..	R. Ogowe	0 0	10 45	S. Esprit and Cœur de M.
Lambaré	"	0 45	10 30	S. Esprit and Cœur de M.
Landana	W. Coast	5 16	12 7	Ch. of Rome.
Malemba	"	5 18	12 10	Ch. of Rome.
Hemlas	"	6 0	12 20	Ch. of Rome.
S. Antoine	"	6 20	12 10	Ch. of Rome.
Bailunda	Angola	12 0	15 25	A. B. F. M.
Bilhe	"	12 50	16 26	A. B. F. M.
Huilla	N. of Kunene..	15 2	14 0	S. Esprit.
Humba	On the Kunene	16 50	15 5	S. Esprit.

The stations of the Livingstone (Congo) Inland Mission (originated by the East London Institute for Home and Foreign Missions) have been recently transferred to the American Baptist Missionary Union.

Positions from the mouth of the Congo as far as Stanley Pool, are taken from the new map by MM. Capello and Ivens (1883) published by the Portuguese Admiralty.

The letters L. R. signify that the station is on the left or right bank of the Congo.

The President then read the following letter from Sir John Kirk to Earl Granville (dated Zanzibar, July 10, 1884) on Mr. Johnston's Expedition:—

"I have received letters from Mr. Johnston, about whose mission I wrote on May 5, 1884, reporting his safe arrival in Chagga, and the favourable reception given him by King Mandala, the absolute ruler of that district. Thus the friendly feeling created by the presents I sent a short time ago has already been of service.

"Mr. Johnston is received and, I understand, kept free of expense by the king, solely on the recommendation I gave him, and he is called the child of the "Balyozi," the name by which the British Agent is commonly known. The king

not only feeds his party, but has given him a suitable place up the mountain where he can build a house and carry on his work by collecting specimens of natural history. Thus he has received every facility and an introduction that but for the happy interchange of presents between myself and King Mandala would not have been possible."

The President after this read a letter from Mr. Joseph Thomson, dated July 30:—

" . . . It would have given me great pleasure to have intrusted you with a communication to the Geographical Section of the British Association, but for the prior claim of the Royal Geographical Society. . . . Although I have made no startling discoveries, I am fortunate in being, along with Dr. Fischer, the first to explore a region that may fairly lay claim to be called unique, whether looked at from the topographical, geological, or ethnographic point of view. I shall have to tell about snow-clad mountains, grassy plateaux, and sterile plains, of picturesque isolated mountains, wonderfully preserved volcanic cones, and craters in which the fiery forces might have been at work the previous year, while their presence is still indicated by steaming fissures, gaseous exhalations, and hot springs. Of other features, I shall have to speak of the charming crater-lake Chala on the slopes of Kilimanjaro, the silvery sheets of Naivasha, Mtakuro, and Baringo, lying embosomed in a great valley-like depression. Not the least interesting subject will be that of the enormous volcanic mountain El-gon or Ligonyi, with its marvellous artificially cave-pierced sides.

"The people themselves, however, are still more interesting and more unique than their country. The Masai are in every respect a people by themselves. They present no point of resemblance either to the true negroes who surround them on the east, south, and west, or to the Galla and Somal who shut them in on the north. They distinctly differ in their strange mode of life, their curious customs, form of government, and religious belief, not to speak of their curious language. You will thus see that my recent expedition is not likely to be by any means barren of results.

"You ask if I found Mr. Coles's instruction useful. I am happy to say that I did so, and that I have been able to determine the latitude of all points of interest by astronomical observation, as well as the longitude of Baringo and Kwa-Sundu near the Nyanza. The heights of all the main points have been determined by George's barometer, the intermediate ones by temperature of boiling water and aneroid.

"The small sketch map of my route (in the July number of the 'Proceedings R. G. S.),' based on my telegram, is very inaccurate. My route from Baringo to near the Nile was almost due west, returning somewhat further north. Kavirondo does not extend so far south, not more than 20' S. The north-east corner of the lake as represented on previous maps must be cut off if my observations are correct."

The Latest Researches in the Mœris Basin. By COPE WHITEHOUSE, M.A.
—At the York Meeting (1881) it had been shown that the ancient writers agreed in describing Lake Mœris as a reservoir of the Nile, 3600 stadia (450 miles) in circumference, with a maximum level above low Nile at Memphis, fifty fathoms deep, longer than its width, from north-east to south-west, in large part surrounded by desert, with an indented coast, blue, full of fish of twenty-two species, with dykes at the two mouths of the canal, by which the engineers stored up or distributed the water which entered or issued from the canal, at an annual outlay of fifty talents of silver, with a multitude of fishermen on its borders, which were fifty days' journey in extent, engaged in catching and salting the fish which bred freely in the lake, while the right of pescary in the great weir was reserved to the crown, and averaged

two hundred and fifty talents. It owed its existence to artificial channels and dykes, constructed with great skill and admirable foresight during successive periods, natural erosion being aided by some means of removing the material through the rush of the Nile. Its waters percolated towards the Natron valley. About the middle of the deepest part was an island. On it were two pyramids and a tomb. Against (not on) these pyramids were two statues. These pyramids were "*Merimeters*." They showed by their height the maximum depth of the lake. Although Mœris is mentioned by Stephen of Byzantium, it appears to have been reduced in area after the visit of Mutianus, but before the death of the elder Pliny. The Ptolemaic text refers to it. The maps which accompany the text depict a *lacus meridii*, considerably to the south-west of Memphis, south of Arsinoë, separated from the river by a mountain chain, and larger than either Maria (Mareotis) or Serbonia. The mediæval and Arabic maps (including Fra Mauro) omit it or substitute the Fayoum (Elfiou, Alphiom) with one or two small bodies of water.

This circumstantial account, which had remained unquestioned for the thousand years of contemporary Greco-Roman history, was assailed by Voltaire, and rejected as incredible by every subsequent writer. The depth, circumference, direction, and level were the principal points attacked by Jomard and Wilkinson. Prior to 1840, common consent favoured the idea that a confusion had arisen which had blended the Birket-el-Qerun, in the north of the Fayoum, with a canal and basin in the Nile valley. In 1843, Linant de Bellefonds (died 1883) asserted that he had run a line of levels through the Fayoum from El-Lahun to the westward, found certain ancient remains, determined them to be older than Herodotus and below the level of the Nile, examined the character of the soil, and discovered the purpose of a dyke conspicuous to the east and south of Medinet-el-Fayoum. M. Linant was wholly unfitted by want of education to discuss the archæological side of the question, but as Director-General of Public Works, his observations as a practical and experienced engineer, were accepted with implicit trust. The *Société Égyptienne* printed his memoir. The section gives the depth of the lake Keiroun (*sic*) at 4 metres; from the surface of the lake to the level of Medinet, 20 metres; and to high Nile, 26 metres. The map and profile indicated a reservoir which M. Linant called Mœris, but which corresponded in no single instance with the sixteen characteristics selected by Herodotus, Strabo, Diodorus, Pliny, and Cl. Ptolemy. It was rejected by Bunsen in the first German edition, but eight years subsequently, at the solicitation of Dr. Lepsius, and on his personal assurance of its accuracy, it was adopted into the English work. It was also inserted in the 'Denkmäler' by Dr. Lepsius. Mariette Pasha, Dr. Brugsch, and M. Maspero translated or interpreted the papyrus (1 and 2) of Bûlaq as fully confirming M. Linant's facts and figures.

In August 1881, therefore, there was an absolute accord between geographers, historians and Egyptologists, thus expressed in the 'Encyclopedia Britannica' (Egypt, 1877): "In this part of the Fayoum to the north of El-Medeeneh may be traced the remains of that remarkable hydraulic work the Lake Mœris. M. Linant, a French engineer, was the first to determine the position and character of this famous work of antiquity; and the results of his investigations are in accordance with the opinions of some who had previously noticed the subject in published works ('Mémoire sur le lac Mœris,' Soc. Eg. 1843). The object of the Lake Mœris was to regulate the irrigation of the Fayoum, and it was valuable on account of its fisheries. It seems rather to have deserved the name of a very large reservoir than that of a lake. Near the lake are several sites of ancient towns. The water is brackish and unwholesome though derived from the Nile, which has at all seasons a much higher level." It was pointed out at the York meeting that the statements made

by each of the opponents of the Herodotus-Ptolemy Mæris involved some inherent impossibility. In each case there was some grave error or fatal blunder. M. Linant had given the breadth of the lake as equal to the length of the present canal including its curves. Dr. Lepsius rendered the error more difficult of detection by omitting the words "*en suivant le cours du Bahr Yousof.*" He assumed that an immense bank of mud had been deposited on the eastern shore and upper plateau, although it is obvious that the alluvium would have been carried into the lowest part of the depression. Such a reservoir could not be "valuable for its fisheries." Twenty-two kinds of fish (and crocodiles) could not breed in a shallow pond at times not over six feet deep. The silence of Dr. Lepsius about the relative height of Dimeh, or the depth below high Nile of any ruins of a pre-Roman date was suspicious. No Pharaonic remains had been catalogued in Paris, Berlin or Turin, as coming from the lower plateau of the Fayoum. They were conspicuously absent from the collections of the British Museum. No early monuments had been reported by Jomard as *in situ*. It was shown that while the assailants had laid themselves open to these charges, the explicit testimony of antiquity had been corroborated by a series of independent observations. A vast Lake Mæris could be traced in philology, mythology, and religion. There were abundant proofs of some work of a grandiose and beneficent character which had profoundly impressed the imagination of the races or individuals who had occupied Egypt and the philosophers who studied at Memphis. Having demonstrated that there was no insurmountable obstacle except unsupported assertion, it seemed probable that an exploration of the desert to the west of the pyramids and to the south as far as Behnesa would disclose depressions or rather erosions which would fulfil all the conditions imposed by the lucid and circumstantial descriptions of the ancient writers. In 1882 and 1883 repeated expeditions were made either alone or with English, Continental, or Arab engineers. The results of the explorations of 1882 were published simultaneously in the 'Revue Archéologique' (Paris, June 1882), and in the 'Proceedings of the Society for Biblical Archaeology' (London, June 1882). They were the subject of a special meeting in London, July 11, 1882 (reported, with map, in the *Athenæum*, July 22), at which Dr. Birch presided, and the evidence was submitted to a rigid scrutiny. Similarly in New York, October 22, at a special meeting held in the rooms of the American Geographical Society, Henry Drisler, LL.D. in the chair (reported, with map, in *New York Herald*, October 22 and 23), the Greek and Latin texts were analysed and discussed. The cartography of the basin was presented in a paper published by the American Geographical Society as Bulletin No. 2 (1882), with an appendix by Chief Justice Daly. In 1883 further researches were undertaken with the sanction of the Egyptian Government, the Bahr Yüsuf followed from Behnesa to Gharaq and Qasr Qerün, and the old cuttings and canal traced in the desert; a pyramid, Haram es-Saneh, visited (discovered?) and measured, to the west of Medüm. These results were presented at a meeting of the Khedivial Geographical Society in Cairo, April 20 (reported, French and English, *Egyptian Gazette*, April 25). The President Abbate Pasha, Sir F. Goldsmid, and others, concurred in the conclusions stated. Dr. G. Schweinfurth communicated an extended account to *L'Exploration* (pp. 763-769), which the Khedivial Geographical Society adapted as a Bulletin and issued to its members.

The position taken tentatively at York may be considered as fully sustained. Any modern statement which contradicts the ancient records is an error of fact or a misapprehension of the true intent and meaning of the ancient writer. There are no pre-Roman remains near the lake, i. e. below the level of high Nile (+ 100) at Memphis. There are no *terrains d'alluvion* (Linant and Lepsius) on the east, except a superficial deposit (four to nine feet). The surface of the lake is rising

rapidly. It was (March 1883) 44·94 m. (ca. 150 feet) below Qasr Qerūn (survey of Gasperoni and self, with a large surveyor's level of great accuracy). The bottom of the lake is therefore "about fifty fathoms" (πεντηκοντόργυιός, Herod.; ὄργυιῶν πενήκοντα, Diod.; quinquaginta passuum, Plin.) below Memphis. The historians necessarily spoke in round terms of a depth which varied in each year not less than 16 feet. There is no contradiction between the papyrus of Būlaq (published by Mariette Pasha, with Introduction, pp. 1-2, translated by M. Mariette, 'Revue Critique,' 29th March, 1872, and by Dr. H. Brugsch, Dict. Geog. s.v. *passim*). The Abbé Amelineau in the 'Revue des Questions Historiques' (October 1883) explains in detail (pp. 576-597), with great force and beauty of expression, the harmony of the Egyptian and Greek geographers.

His conclusion that, "une fois de plus le récit d'Hérodote est confirmé sans parti pris, par une étude sérieuse et scientifique de toutes les données d'un problème qu'on avait trop légèrement traité d'insoluble, et à point nommés les monuments de l'antique Égypte, les hymnes de ses poètes viennent confirmer l'entente du voyageur ancien et du voyageur moderne," has received the open approval of such distinguished authorities as M. Renan and Prof. Perrot. M. Maspero, with characteristic liberality, has expressed his readiness to further any investigations, whether in actual excavations or in researches in the Museum of Būlaq. The impulse given to inquiry by the removal of those objections which had dwarfed "Mœris" into a shallow reservoir stimulated Dr. Pleÿte of Leyden to procure and publish (1884) a copy of a tracing from a lost papyrus, known as the Papyrus of the Labyrinth. The Dutch Academy of Sciences, under the title of 'Over drie Handschriften op Papyrus,' have made accessible to the learned world one of the most valuable remains of Egyptian geography. The eight plates form a map over 11 feet in length. It is more than probable that it is, in part at least, a copy of the plan of the Labyrinth and the succession of carvings in bas-relief on its walls. It may be as old as the time of Moses, the extension of Mœris into the Wadi Reian, or the improvements and repair of the Labyrinth under a later Pharaoh.

In Arabic and Hebrew tradition Lake Mœris is identified with the Pithom of Exodus i. 11. The name Pi-Tum, the West, is so peculiarly appropriate, and the general statement of Josephus that the Israelites were employed upon irrigation works so inherently probable, that the authorities cited in the *Academy* (Pithom, Fayoum, Mœris, July 14, 1883), and in the 'Proceedings of the Society for Biblical Archaeology' (June 1883), ought not to be disregarded. The Bahr Jusuf was *not* called after Saladin (Encyc. Brit., Egypt). The tradition is of extreme antiquity, and prior to the Mahomedan conquest. It was an oversight of De Sacy, and should be corrected. The language of Benjamin of Tudela ('Early Travels in Palestine,' Bohn, pp. 118-120) shows that in the twelfth century the Jews in the University at Memphis taught, without the slightest reserve or suspicion of doubt, that Alfiom (El-Fayoum) was Pithom, Raameses Heliopolis, and Zoan Old Cairo (*Mæsar Antika*). The "land of Egypt" did not extend to the Red Sea or the frontiers of Nubia in the limited technical sense in which the Hebrew geographers employed it. The evidence for a Raameses-Miamun in the north-east delta is very unsatisfactory (Lepsius in the *Zeitschrift für Æg. Sp.* against M. Naville and Dr. Brugsch in the 'Deutsche Revue,' 1884). The land of Mizraim, Goshen, or Zoan, where the children of Israel lived from the triumph of Joseph to the Exodus, was evidently supposed by the R. Nathaniel, President of the Jewish University, to extend beyond Beni-Suef to the south, but little further than Tel el Yahoudeh to the north. Josephus gives a southern route to the Exodus. The body of evidence is complete and continuous. Es-Saadia must have been right in translating Pithom El-Fayoum, and he is termed by the Arabic and Hebrew writers Elfayoumi or Hapithomi. Grave

suspicion attaches to the genuineness of the stone reputed to have been discovered by the Arabs at Tel el Maschuta (1883). The Antonine Itinerary ought not to be discredited without further proof that this is not only genuine, but had a definite connection with the spot where, *in the absence* of M. Naville, it is said to have been dug up.

The movement started in 1881 promises further immediate and valuable results. Dr. Schweinfurth has traversed (1884) a part of the desert to the south of the Pyramids and to the north of the Birket el-Qerûn, spending twenty-two days in an examination of its conchology and the general configuration of the country. He visited ruins to the north of Dimeh, and at the same level above the lake, whose water supply shows their relative position. He found fresh-water (*not brackish*) shells on the old beaches, as he had previously found them on the *top* of the island (Haroun) in the lake. He was unfortunately unable to penetrate the Wadi Reian, always a work of some danger, or at least so represented by the Bedouins, who were only persuaded (March 1882, 1883) with difficulty to camp beyond cultivation in the south or west. He has returned to Berlin, and having represented to the proper authorities the necessity of correcting the errors in the 'Denkmäler,' has obtained a grant to be used in further topographical researches in the neighbourhood of the Fayoum. The surveys of 1882 and 1883, the maps and sketches obtained from Mason Bey and Rousseau Pasha, original field-books and notes confirmed by the observations of Messrs. Petrie, Ellis, Gasperoni, and other engineers, taken for this purpose at different times to points to the south, north, and west, have been placed at Dr. Schweinfurth's disposal, as well as in the Intelligence Department of the War Office. The Wadi Fadlei, west of the Kom el Kashab, will appear for the first time on the new map of Kiepert.

If Lake Mœris were correctly described, then the Labyrinth was not discovered by Lepsius, and is not reduced to the mud-brick walls at Howara. The representations of these remains in the 'Denkmäler' might excite distrust from their vague colouring and absence of any accurate standards of measurement in the highly imaginative pictures. They were photographed (1882) and repeatedly examined (1883), and the conjecture (1881) confirmed that they had no connection whatever with the Egyptian Stone City. M. Jomard was guarded in his assertions, and there is no doubt that the Prussian Expedition, unfortunately, misled the scientific world in their hasty and unfounded claims. No doubt, however, was previously (1881) entertained as to the site. If the Labyrinth had been at Howara, the prediction of the historians of the Roman period, incidentally confirmed by Ælius Aristides, that the building could never perish, would have been falsified. But Dr. Pleyte, in his memoir to the Dutch Academy of Sciences, cites with approval (p. 45) the opinion (see Bib. Arch., June 1883) that this "portentosissimum humani impendii opus" (Pliny) could have been constructed on a colossal scale without difficulty in the horizontal strata of limestone and be as enduring as Stonehenge. French, German, English, and American scientific papers and leading Egyptologists have urged that excavations should be commenced in the place where its 1500 subterranean chambers may, it is now thought, with reasonable probability, be found. Its discovery would certainly rank above Lake Mœris in archaeological value. The suggestion that there was no Cretan labyrinth and that the Minotaur was the statue of Serapis (Proc. B. A., June 1883) mentioned by Pliny, has received the support of Dr. Pleyte. Whether *Men-Hathor* or *Menevis-taurus* (Pleyte) be the derivation is of comparatively little consequence. The whole myth of Theseus would receive a new interpretation, based upon geographical considerations and borrowed bodily from Egypt. If, however, vistas of illimitable extent present themselves to the student, the discovery of the physical conditions of the Wadi

Reian is thought to be of greater practical importance. In the *Saturday Review* (Dec. 1, 1883) Mr. C. S. Maine summed up the advantages which would accrue to Egypt by a partial restoration of the lake. If the Wadi Reian were filled with water from the Nile, a lake 40 miles long, 20 miles wide, and 300 feet deep, thus formed, would amply suffice for the needs of irrigation and check an excessive overflow of the river. (See also *Century*, Oct. 1884.) The Ptolemaic maps represent a *Lacus Meridis*, either conventionally, as in the Mount Athos manuscript and the 'Septe Giornate della Geographia' of Francesco Berlingeri, or as in the Roman MSS., with an apparent attempt to give to it as well as to *Maria* (Mareotis) and Serbonis the actual contour. The centre of the entire district, according to the text of Cl. Ptolemy, is near Qasr Qerūn, but the centre of the lake on the maps is much further to the south. "*Bacchi*" is separated, and at a considerable distance, from the northern boundary of the lake, which is, therefore, not the northern shore of the present Birket. It lies too far to the west and to the south of the latitude of Arsinoë, to have been a merely conjectural insertion of mediæval geographers, founded solely upon the text of the Greek historians. It would seem as if there had survived into the fourteenth century a sketch of this lake as it may have appeared after the Fayoum basin had been fully redeemed for cultivation. It is so described in the graceful tales in which Persian and Arab poets chronicle the labours of the patriarch Joseph. The survey of 1883 shows that the southern basin could be filled without flooding the Fayoum.

An examination of the various papers cited, and the unanimous opinion of the distinguished experts who, in their respective departments of study, have adopted or endorsed these opinions and facts, prove that the suggestions made at York in 1881, and the arguments and conclusions founded upon more recondite researches in the library, have been verified, and are now rightly presented as admitted facts to the same body at Montreal in 1884.

On Maps of Central Africa down to the beginning of the 17th Century.
By E. G. RAVENSTEIN (will be published in November number).

NEW BOOKS.

(By E. C. RYN, *Librarian* B.G.S.)

EUROPE.

[**Balearic Isles.**—Die Balearen. In Wort und Bild geschildert. Fünfter Band. Die eigentlichen Balearen. Erste Hälfte, pp. vi. and 1-444; Zweite Hälfte, pp. 445-799. Leipzig (Brockhaus): 1884, imperial 4to., coloured plates, illustrations, map, plans, profile and table in cover.

These two large volumes contain the completion of part ii. (specieller Theil) of the third book, according to the illustrious author's scheme, practically completing Mallorca (see R.G.S. 'Proceedings,' 1883, p. 179, for vol. iv.). Subsequent volumes on Menorca indicated in the preface. The present one discusses:—1, the south-western hilly-region, composed of spurs of the Sierra de la Burguesa, behind Palma; 2, the northern slope of the Sierra and its high places; 3, the southern incline of the chain with its passes; 4, the high-road of Inca, from Palma to Alcudia; 5, the eastern part of the island; 6, the south-eastern hill country; 7, Manacor and the centre of the island (with plan of the Dragon Cave, San Moro, scale 1:500); 8, the Manacor high-road; 9, the southern part of the island; 10, the railroads; 11, the coasts; and 12, the island of Cabrera (map, scale 1:45,000, of it and Conejera, &c., with insets of Puerto Mayor, 1:15,000, and of the citadel). A table of distances from Palma of the principal points in Mallorca is given in the cover, with a panoramic view from the top of the Puig Mayor.

It is, however, in the charming illustrations that the chief value of these volumes consists, as in the case of their predecessors. The pencil of the Archduke Ludwig Salvator of Austria is equally at home when sketching rugged coast-line or smiling landscape; and the very numerous chromolithographs taken from his drawings show a marked increase of luminosity, as compared with those in the earlier volumes, good as they were; whilst the woodcuts leave nothing to be desired in vigour or delicacy of treatment according to their subjects. Probably no other work exists capable of giving so complete an idea of all aspects of the physical geography of any single country.

Miessler, Adolf.—*Deutscher Geographien-Almanach. Begründet und herausgegeben von Adolf Miessler. I. Jahrgang, 1884. Hagen i. W. (Hermann Risel & Co.): 1884, 8vo., pp. v. and 568. (Dulau: price 5s. 3d.)*

The primary object of this Almanac is to give an account of all German geographical men and matters, the only extraneous allusions being in a curious list of geographical eventful days in centuries and half-centuries, correlated with 1884, a geographical calendar for the year, a necrology, and a catalogue of extra-German Geographical Societies and Associations (remarkably erroneous; our own Royal Society and the Glasgow Philosophical Society being included, for instance). It contains good accounts of German Geographical Societies, German geographical publishers, cartographers, and travellers, with their addresses, and geographical professorial chairs in German higher schools; and German geographical journals and institutions.

Perret, Paul.—*Les Pyrénées Françaises. III. L'Adour, La Garonne, et le pays de Foix. Paris (Oudin): 1884, large 8vo., pp. 464, illustrations. (Dulau: price 10s.)*

Continues the work of which vol. ii. was noticed in Proc. R. G. S. 1882, p. 573. A fourth volume, to include L'Aude et Roussillon, is now promised in 1885, and will complete the publication, each part of which is independent of the others. The illustrations maintain their high standard as representations of physical features.

ASIA.

Mackenzie, Alexander.—*History of the Relations of the Government with the Hill Tribes of the North-east Frontier of Bengal. Calcutta (Printed at the Home Department Press): 1884, large 8vo., pp. xiv. and 586 [no index], map.*

Although essentially political in aim, this work must claim authority on the local topography of the North-eastern Bengal frontier, describing as it does the boundaries of the various independent territories and the operations (military and surveying) among the hill tribes north, east, and south of the Assam Valley and of the western slopes of the great mountain system lying between Bengal and Independent Burma, with its outlying spurs and ridges. In dealing with the political relations of the Indian Government with these tribes, the author traverses from west to east the sub-Himalayan ranges north of the Brahmaputra, then turns westward along the course of the ranges bounding the Assam Valley on the south, and finally explores the highlands interposed between Cachar and Chittagong, and the hills separating the maritime district of Chittagong from the empire of Ava. This extensive area is shown on a map from the Surveyor-General's Office, on the scale of 32 miles to the inch.

Mr. Mackenzie deals in separate chapters with Bhutan proper, the Extra-Bhutan Bhutias, the Akas, Hazari-Khawas and Kapachors, Duphla tribes, Abors and Miris, Mishmis, Khampti clans of Sadiya, Singhphos of Sadiya, Moarniabs of Muttuck, Naga tribes, tribes of North Cachar, Manipur Mikirs and Rengma Nagas, Khasi and Jaintia hills, Garos, Hill Tipperah, Lushai or Kookie tribes, and Chittagong frontier tribes. In the appendices various details are given, chiefly referring to Assam and the Lushais.

Walker, [Lieut.-General] J. T.—*Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India. Vol. xvii. Descriptions and Co-ordinates of the Principal and Secondary Stations and other Fixed Points of the Gurwani Meridional Series or Series N, and the Gora Meridional Series or Series O, of the North-east Quadrilateral: pp. viii. and 50, ix. and 32. Vol. xviii. Descriptions*

. . . of the Hurilaong Meridional Series or Series P, and the Chendwar Meridional Series or Series Q, of the North-east Quadrilateral: pp. ix. and 49, viii. and 22. Vol. xix. Descriptions . . . of the North Parasnath Meridional Series or Series R, and the North Malluncha Meridional Series or Series S, of the North-east Quadrilateral: pp. xii., vi., and 16, viii. and 21. Vol. xx. Descriptions . . . of the Calcutta Meridional Series or Series T, and the Brahmaputra Meridional Series or Series V, of the North-east Quadrilateral: pp. x., x., and 28, xiv. and 38. Vol. xxi. Descriptions . . . of the East Calcutta Longitudinal Series or Series U, and the Eastern Frontier Series, Sec. 23° to 26° or Series W, of the North-east Quadrilateral: pp. x., xii., and 26, x. and 39. Dehra Dun (Office of the Trigonometrical Branch, Survey of India; B. V. Hughes): 1883, 4to., maps.

Although continued above under the name of General Walker, vols. xix.-xxi. are prepared by the Officiating Deputy Surveyor-General, Mr. J. B. N. Hennessey and his assistants, and published under the orders of Col. G. C. De Pré, Officiating Surveyor-General of India. As in preceding volumes, all the values of longitude require a constant correction, probably of $-2' 30''$, a warning carefully repeated from time to time.

Werner, W.—Das Kaiserreich Ostindien und die angrenzenden Gebirgsländer. Nach den Reisen der Brüder Schlagintweit und anderer neuer Forscher dargestellt. Jena (Costenoble): 1884, 8vo., pp. xii. and 639, illustrations. (*Dulau: price 9s. 9d.*)

Practically a further working up of the Schlagintweit material, already sufficiently familiar.

AMERICA.

Bove, Giacomo.—Expedition Austral Argentina. Informes Preliminares presentados a S.S. E.E. los Ministros del Interior y de Guerra y Marina de la República Argentina por Giacomo Bove, Jefe de la Comision Cientifica de la Expedition, y publicados bajo la direccion del Instituto Geográfico Argentino, precedidos de una Introduccion y de otros documentos relativos a la expedicion Austral Argentina. Buenos Aires (Imp. del Departamento Nacional de Agricultura): 1883, 8vo., pp. 217, maps and illustrations.

For this and the subsequently noticed work of Don Ramon Lista, the library is indebted (amongst other South American books and pamphlets) to the courtesy of Don Saturnino Salas, President of the Topographical Department, Argentine Republic, an Honorary Corresponding Member of the Society since 1865.

The work now under notice, which is profusely illustrated with roughly executed photo-lithographs and maps, practically covers the same ground as the Genoa Report noticed in the last vol. of our 'Proceedings,' p. 112.

The maps represent corrections in the central part of Staten Island, Port Roca, Beagle Straits as corrected, Port Josefina and Negro fiord in Magdalens channel, landaia in Beagle Straits, Port Hope in Clarence Island, Banner Cove (Picton Island), Tierra del Fuego coloured ethnographically, and a physical sketch of Argentine Patagonia. The illustrations represent various physical features of the country, and also ethnological objects.

Donaldson, Thomas.—The Public Domain. Its History, with Statistics, with reference to the National Domain, Colonisation, Acquirement of Territory, the Survey, Administration and several methods of sale and disposition of the Public Domain of the United States, with sketch of legislative history of the Land States and Territories, and references to the Land System of the Colonies, and also that of several foreign governments. Washington (Government Printing Office): 1884, 8vo., pp. xii. and 1343, maps.

Originally prepared under a Committee on Codification of the Public Land Commission (Secretary, Captain Clarence E. Dutton), giving results to 1880,

this 3rd edition of a national work has received various additions and revisions up to December 1, 1883. On its value to future settlers and residents there is no need to enlarge; as regards political geography, it claims a place here, on account of its succinct definitions of boundaries of the different portions of the 4,000,000 square miles now forming the national domain of the United States, from the earliest times, accompanied by such historical particulars as have a local bearing.

Many details of the various surveys of public lands are given, including geographical positions of the principal surveying meridians and base lines (p. 179). There are 13 maps, and various diagrams, showing acquisitions from 1776, different methods of surveys, Indian reservations, grants for railroads, &c., precious metal, timber, and desert lands, &c.

Inwards, Richard.—The Temple of the Andes. London (Vincent Brooks, Day & Son): 1884, demy 4to., pp. 36, 19 illustrations. Price 5s.

The author spent about a year (in 1866) in Bolivia, on the sides of Mount Sorata, in the heart of the Aymará Indian country, and made some journeys to Lake Titicaca, during which he studied the remains of Tiahuanaco. Of these he gives descriptions and plans, with various detailed illustrations, and a recapitulation of the records of ancient and modern writers on the subject. No explorations (except for gold) worthy of the name have yet been made in this region, so rich in relics of the very early civilisation of the New World, which show evidences of greater advancement in the arts than are seen in any other remains found in the Western Hemisphere. They are considered to afford curious points of resemblance to the ancient Egyptian works, and to be intimately connected with the early and primitive religion of Peru under the Incas.

Lista, Ramon.—El Territorio de Las Misiones. Buenos Aires (Imprenta "La Universidad" de J. N. Klingelfuss): 1883, large 8vo., pp. 114, maps and illustrations.

The author ascended the Paraná to a little above the Tacuari confluence, making various small journeys in the Territory de las Misiones, called also País de los Pinares, the northern point of the Argentine Mesopotamia, crossing from Posadas (opposite Itapúa) to Concepcion and San Javier on the Uruguay; working inland a little way up the Nean-guazú, Piray-guazú, and Piray-mini, eastern affluents of the Paraná; and ascending the I-guazú or Curitiba, the northern limit of the territory, as far as its great cataract. After a sketch of the work of the Jesuits in this region, their expulsion in 1768, and the subsequent obliteration of their Guarani converts, the author gives a brief account of explorations in it from Alvar Núñez to Azara, Bonpland, De Moussy, and Peyret, and then discusses its limits and statistics (9000 inhabitants only), orography, and geology. On the south-west, the boundary line is an imaginary one, starting between the heads of the Chimaray and Pindapoy and following their respective courses to the rivers Uruguay and Paraná respectively; but in view of the probable nationalisation of Posadas, it is noted that the Itaimbé will probably be substituted for the Pindapoy as a frontier. The eastern boundary separating the territory from Brazil starts in like manner from the head-waters of the Pepiri-guazú feeder of the Uruguay, and follows the divide to the head of the San-Antonio-guazú, a tributary of the Curitiba. In describing the chief hydrographical features of the Territory, some details and an illustration are given of a magnificent cataract of the latter river, to which reference is made in the "Geographical Notes" *suprà*. The river is always navigable for small boats to within some 10 miles of its confluence with the Paraná, having so slight a declination that its waters so far appear motionless; it then becomes torrent-like, dashing impetuously over black blocks of basaltic rock. The scenery on its banks is described as very beautiful.

Some observations on the little-known Mberuy and Chico falls of the Uruguay are also made by the author, who quotes a local work by Don José Maria Reyes as to the latter impediment to navigation.

After describing the climate and agricultural capabilities of the Territory,

its commerce (chiefly Yerba-mate, *Ilex paraguayensis*) and means of communication are discussed, especially as regards the Apipé rapids of the Upper Paraná, on which the 1882 Report of Hunter Davidson is quoted; with notices of the flora (Yerba-mate being separately treated), fauna, and ethnography, and some remarks on colonisation. A short vocabulary of the Guayaná tongue is given in the appendix.

The maps represent the whole territory of Misiones, showing the author's route, and the Upper Paraná from Itapúa to Tacurú-pucú, the limit of steam navigation, on a larger scale.

Woldt, A.—*Capitain Jacobsen's Reise an der Nordwestküste Amerikas, 1881-1883, zum Zwecke ethnologischer Sammlungen und Erdkundigungen, nebst Beschreibung persönlicher Erlebnisse, für den deutschen Leserkreis bearbeitet von A. Woldt.* Leipzig (Max Spohr): 1884, 8vo., pp. xviii. and 431, maps and illustrations. (*Dulau*: price 13s. 2d.)

Captain J. A. Jacobsen appears to have been sent as a collector and trader by the Auxiliary Committee for procuring ethnological material for the Royal Berlin Museum; he spent from July, 1881, to the end of last year on the coasts of British Columbia and Alaska, and was very successful, bringing home between six and seven thousand ethnographical objects. The present volume (profusely illustrated from photographs of the specimens brought back) only professes to give a general account from Jacobsen's diaries; a more elaborate and technical publication of the results of his voyage is being prepared under the title of "Amerika's Nordwestküste" by the Directors of the Ethnological Museum in Berlin, of which one part has already been published, with chromolithographs and photographs (Asher: price 50s., folio). Captain Jacobsen (as on the voyage above mentioned, under scientific instructions from Prof. Bastian) is now to be sent straight across Europe and Asia to the Amur region, on a similar collecting expedition.

A clearly executed map (scale 1:11,500,000), of the north-west coast of America from San Francisco to Point Barrow, shows Jacobsen's route, with insets of Vancouver and Queen Charlotte's islands (scale 1:4,800,000). His furthest northern point was Kotzebue Sound, just within the Arctic circle, and his furthest western point Unalaska. Much work was done in the region of the delta of the Kwik-Pak or Yukon river, of which a separate map, scale 1:3,000,000, is given, with inset of the Iliamna Lake on the like scale. There are also two other maps showing land journeys; one (scale 1:2,360,000) of the neck between Kotzebue Sound and Norton Bay; the other (1:1,700,000) of the country between Kuskoquim and Togiak bays, south of the Yukon mouth.

GENERAL.

[**'Challenger.'**]—Report on the Scientific Results of the Voyage of H.M.S. *Challenger* during the years 1873-76, under the command of Captain George S. Nares, R.N., F.R.S., and Captain Frank Tourle Thomson, R.N. Prepared under the superintendence of the late Sir C. Wyville Thomson, Knt., F.R.S., &c. . . . and now of John Murray. Zoology—vol. ix. Text, pp. xxii. and 814, maps. Plates separate. London (Longmans & Co.), &c.: 1884, 2 vols., 4to. Price 63s.

Continuing the series noticed above, p. 485. The present volumes describe the *Foraminifera*, by H. B. Brady.

Thenaud, Jean.—*Recueil de Voyages et de Documents pour servir à l'histoire de la Géographie depuis le xiii^e jusqu'à la fin du xvi^e siècle. V. Le Voyage d'Outremer (Égypte, Mont Sinay, Palestine) de Jean Thenaud, Gardien du couvent des Cordeliers d'Angoulême; suivi de la Relation de l'Ambassade de Domenico Trevisan auprès du Soudan d'Égypte, 1512. Publié et Annoté par Ch. Schefer, Membre de l'Institut.* Paris (Ernest Leroux): 1884, large 8vo., pp. xc. and 297, illustrations. (*Williams & Norgate*: price 20s.)

This fifth volume of the valuable series recently undertaken by M.M. Schefer and Cordier (Proc. R.G.S. 1883, p. 499) commences with an historical sketch of

the visits of European merchants or pilgrims to Cairo during the 14th and 15th centuries, with an analysis of the accounts by Frescobaldi and Sigoli in 1384 and the Dominican Felix Faber in 1483, and of subsequent political events bearing upon the relations of Egypt with the western nations, including the selection of Domenico Trevisan in 1511 as envoy from Louis XII. to the Sultan Qansou Ghoury (Melik el Achreef). Thenaud accompanied the embassy with a religious object, on the part of Louise of Savoy; he appears, after landing in Sicily, to have actually visited Alexandria and Cairo, Mount Sinai, Jerusalem, Damietta, and Rhodes; and to have interpolated a description of Mecca and Medina, taken from the voyage of Ludovico Varthema. Trevisan's journal is reproduced, giving the exact incidents of his voyage and stay at Cairo.

Reproductions of a portrait of the Sultan and of a MS. map of Rhodes from the "*Liber Insularum*" of Buondelmonte, accompany the volume.

NEW MAPS.

(By J. COLES, *Map Curator R.G.S.*)

EUROPE.

Deutschen Reiches.—Karte des——. Herausgegeben von der kartogr. Abtheilung der Königl. Prouss. Landes-Aufnahme 1884. Scale 1:100,000 or 1·3 geographical miles to an inch. Sheets:—215. Rheinsberg. 383. Arolsen. 553. Diedenhofen. 568. Metz. 569. St. Avold. Price 1s. 6d. each. (*Dulau.*)

Europa.—Orohydrographische Wandkarte von——, von W. Keil. Scale 1:4,000,000 or 55·5 geographical miles to an inch. Fischer, Kassel. 9 sheets. Price 11s. (*Dulau.*)

—— Wandkarte von——, von Berghaus-Gönczy. Scale 1:4,000,000 or 55·5 geographical miles to an inch. Justus Perthes, Gotha. 9 sections (in Hungarian). Price 7s. (*Dulau.*)

Homburg.—Topographische Karte der Umgegend von——. Scale 1:50,000 or 1·4 inches to geographical mile. L. Ravenstein, Frankfurt a/M. Price 2s. (*Dulau.*)

Italy.—Carta in rilievo dei Laghi Lombardi e della ferrovia del Gottardo (Cirea). C. Cherubini. 3 feet by 2 feet. Turin, Favale. Price 3l. 10s. (*Dulau.*)

Norden af Dr. Magnus Roth. Scale 1:1,000,000 or 13·6 geographical miles to an inch. P. A. Norstedt & Söners förlag. Gen. Stab. Lit. Anst., Stockholm, 1883. 8 sheets. Price 10s. (*Dulau.*)

Tillo, A.—Höhenkarte des Europäischen Russland. Ministerium der Kommunikationstrassen, St. Petersburg. Scale 1:2,520,000 or 34·5 geographical miles to an inch. 6 sheets. 1884.

ORDNANCE SURVEY MAPS.

Publications issued from 1st to 31st May, 1884:—

1-inch—General Map:—

ENGLAND AND WALES. New Series. Sheet 242 (in outline); 1s.

6-inch—County Maps:—

ENGLAND AND WALES: Glamorganshire (part of): Sheet 10; 2s. 6d. Hertfordshire (part of): 28; 2s. 6d. Bedfordshire (part of): Quarter sheet, 7 N.E.; 1s. Cornwall (part of): 16 N.E.; 1s. Gloucestershire (part of): 17 N.W.; 1s. Norfolk (part of): 95 N.E.; 1s. Nottinghamshire

(part of): 22 S.W. with 31 S.W. (Derbyshire); 28 S.E.; 44 N.W., 44 S.W. with 2 S.W. (Leicestershire); 47 N.W., 47 N.E. with 6 N.E. (Leicestershire); 47 S.W. 47 S.E. with 6 S.E. (Leicestershire); 50 N.W., 50 N.E. with 11 N.E. (Leicestershire); 50 S.W. with 11 S.W. (Leicestershire); 51 N.W. with 12 N.W. (Leicestershire); 1s. each. **Somersetshire** (part of): 3 S.W.; 5 N.W., 5 N.E., 5 S.E.; 6 N.W., 6 S.W.; 8 N.W., 8 S.E.; 10 N.E.; 11 N.W., 11 N.E.; 12 N.W., 12 N.E., 12 S.W.; 13 S.W., 13 S.E.; 1s. each. **Staffordshire** (part of): 40 S.W.; 50 S.W.; 61 N.E.; 1s. each.

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ENGLAND: Bedford: Blunham 5 sheets; Cardington 7; Moggerhanger 8; Renhold 8; Roxton 9; Sutton 8; Tempsford 9; Turvey 12; Willington 6. **Cornwall:** Calstock 11; Lewannick 11. **Derby:** All Saints 3 and Ar. Bk.; Burton-upon-Trent 11; Croxall and Do. (Det. Noa. 1, 2, and 3) 11 and Ar. Bk. **Gloucester:** Aldsworth, Ar. Bk.; Ampney St. Peter 5 and Ar. Bk.; Aston Blank 8; Cam and Do. (Det. No. 3) 11 and Ar. Bk.; Chedworth 13; Compton Abdale 7; Eastington 8; Farmington 8; Hampnett 4; Highleadon 3; Kempsey 5; Meyse Hampton 9 and Ar. Bk.; Moreton Valence (Det. No. 2) 4; Northleach 1; Oxenhall 8; Preston 6; Rendcomb 7; Stinchcombe and Berkeley (Det. No. 2) 8 and Ar. Bk.; Stowell 5; Yanworth 6. **Norfolk:** Beeston St. Andrew 3; Carbrooke 7; East Wretham 10; Frettenham 8; Flapton 4 and Ar. Bk.; Flockham, Ar. Bk.; New Buckenham 2; Ovington 6 and Ar. Bk.; Rondham 9; Shipdham 13; Shropham 8; Winburgh, Ar. Bk.; Woodrising, Ar. Bk. **Shropshire:** Bobbington 4 and Ar. Bk.; Cardington 17; Monkhopton, Ar. Bk. **Stafford:** Haselour 6; Scropton (Det.) 2 and Ar. Bk.; Teddesley Hay (Re-survey) 8 and Ar. Bk. **Suffolk:** Alnesbourn Priory, Ar. Bk.; Ampton 6; Badingham 12; Blaxhall, Ar. Bk.; Blythburgh 11; Bramfield 8; Carlton 3; Copdock 7; Darham 5; Great Glemham 8; Great Livermere 8; Hengrave 4; Honington 7; Ingham 8; Lackford 7; Little Livermere 8; Rendham 8; Rushford 7 and Ar. Bk.; Sibton 10; South Cove 5; Thorington 6 and Ar. Bk.; Timworth 5; Troston 8; Walberswick 7; Walpole 7; Wangford 6; Westerfield, Ar. Bk.; Westleton 11 and Ar. Bk.; Whitton cum Thurlston, Ar. Bk.; Wordwell 10; Yoxford 6. **Worcester:** Cradley, Ar. Bk.; Hagley 9; Lutley, Ar. Bk.

Town Plans: Scale 1:500:—

ENGLAND: Beccles, 16 sheets. Bridgenorth, 12. Kidderminster, 28. Tamworth, 6.

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1-inch—General Map:—

IRELAND: Sheet 198 (hill-shaded); 1s.

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ENGLAND AND WALES: Glamorganshire (part of): Sheet 22; 2s. 6d. **Hertfordshire** (part of): 7, 11, 13; 2s. 6d. each. Sheet 31 filled in with parts of 31, 32, 41, 42 (Essex); 2s. 6d. each. Sheets 6, 18; 2s. each. **Derbyshire** (part of). Quarter sheets: 31 N.E. with 22 N.E. (Nottinghamshire); 56 N.W. (with 45 N.W. Nottinghamshire and 5 N.W. Leicestershire); 57A N.E. with 40 N.E. (Staffordshire); 59 N.E. with 47 N.E. (Staffordshire); 1s. each. **Leicestershire** (part of): 5 N.W. (with 56 N.W. Derbyshire and 45 N.W. Nottinghamshire), 5 S.W. with 56 S.W. Derbyshire and 45 S.W. Nottinghamshire); 7 S.W.; 17 S.W., 17 S.E. 18 S.W.; 19 S.W.; 24 S.W.; 25 N.E.; 1s. each. **Nottinghamshire** (part of): 22 N.E. with 31 N.E. (Derbyshire); 39 N.E.; 41 N.E., 41 S.W. with 51 S.W. (Derbyshire), 41 S.E.; 44 S.E. with 2 S.E. (Leicestershire); 45 N.W. (with 5 N.W. Leicestershire and 56 N.W. Derbyshire), 1s. each. **Staffordshire** (part of): 39 S.E.; 41 N.W. with 57 N.W. (Derbyshire); 43 S.E.; 47 N.W., 47 N.E. with 59 N.E. (Derbyshire); 1s. each. With Contours: 5 N.E. with 27 N.E. (Derbyshire); 14 N.E.

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Town Plans: Scale 1:500:—

ENGLAND: Brierley Hill, 20 sheets. Burton-upon-Trent, 35. Droitwich, 10. Lichfield, 9. Norwich, 14. Stourbridge, 24. Stroud, 13. Sudbury, 15.

ASIA.

Darwas.—Alb. Regels Reise in—, November und Dezember 1883. Scale 1:1,250,000 or 17·1 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1884, Tafel 13. Justus Perthes, Gotha. (*Dulau.*)

Merw und das russisch-persische Grenzgebiet. Nach den neuesten Quellen gezeichnet von Bruno Hassenstein. Scale 1:2,000,000 or 27 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' 1884, Tafel 11. Justus Perthes, Gotha. (*Dulau.*)

Palestine.—Carte de la—, et du Liban, par L. Thuillier. Scale 1:500,000 or 6·8 geographical miles to an inch. Hachette, Paris, 1884. Price 8s. (*Dulau.*)

AFRICA.

Algérie.—Carte générale de l'—, à l'échelle de 1:3,200,000 or 43·8 geographical miles to an inch, d'après celle du Dépôt de la Guerre par V. A. Maltebrun. Gravée par Erhard. (*Dulau.*)

Kongo-Gesellschaft.—Das Gebiet der Internationalen —. Nach R. de Lannoy, Chavanne u. a. Scale 1:3,000,000 or 41·6 geographical miles to an inch. Petermann's 'Geographische Mitteilungen,' 1884, Tafel 12. Justus Perthes, Gotha. (*Dulau.*)

Sénégal.—Colonie du —. Possessions françaises de la côte occidentale d'Afrique depuis le lac Téniahié jusqu'à Sierra-Leone, par. C. Mathieu. Paris, Dufrenoy. (*Dulau.*)

Sierra Leone.—The Settlement of — in January 1884. From Admiralty Charts and Recent Surveys, Treaty Table from Official Records, by Captain H. M. Jackson, R.A. Scale 1:696,960 or 9·5 geographical miles to an inch. Lithographed at the Intelligence Branch, War Office, London, March 1884.

This map contains a table of reference to treaties with the native chiefs of the surrounding countries; it also gives the names of the chiefs at the present date, but is without any hill shading.

AMERICA.

Grönlands Inlandsis.—Karta öfver 1883 års Svenska Expedition på —, under befäl af A. E. Nordenskiöld. Af Expeditionens topograf: C. J. O. Kjellström. Gen. Stab. Lit. Anst. Stockholm. (*Dulau.*)

Vereinigten Staaten.—Herkunft der deutschen Auswanderer nach den — 1881–83.

— — — Verteilung der deutschen Einwanderer in Staaten und Territorien der Vereinigten Staaten nach dem Zensus von 1880. Petermann's 'Geographische Mitteilungen,' 1884, Seite 322, 323. Justus Perthes, Gotha. (*Dulau.*)

AUSTRALASIA.

Neuseeländischen Alpen.—Skelet-Karte des Centralstockes der —. Von Dr. R. v. Lendenfeld. Scale 1:338,000 or 4·6 geographical miles to an inch.

— — — Karte des Tasman-Gletscher von Dr. R. von Lendenfeld. Scale 1:80,000 or 1 geographical mile to an inch. Petermann's 'Geographische Mitteilungen,' Ergänzungsheft No. 75, Taf. 1, 2. Justus Perthes, Gotha, 1884. (*Dulau.*)

Winnecke, Charles.—Plan showing explorations by —. Copied from his original plans in the Office of the Surveyor-General. Adelaide, 1884. Scale 1:500,000 or 6·8 geographical miles to an inch.

The explorations contained in this map help to fill in the blank which has hitherto appeared in the map of Australia between the hundred and thirty-fifth and the hundred and thirty-eighth meridians of E. longitude and the twenty-third and twenty-fifth parallels of S. latitude. The report accompanying this map has been fully noticed elsewhere in the present number of the 'Proceedings.'

ATLASES.

Atlantic, Indian, and Pacific Oceans.—Charts showing the Surface Temperature of the —. Published by the Authority of the Meteorological Council. London: Printed for Her Majesty's Stationery Office, and sold by J. D. Potter and E. Stanford. 1884. Price 17. 2s.

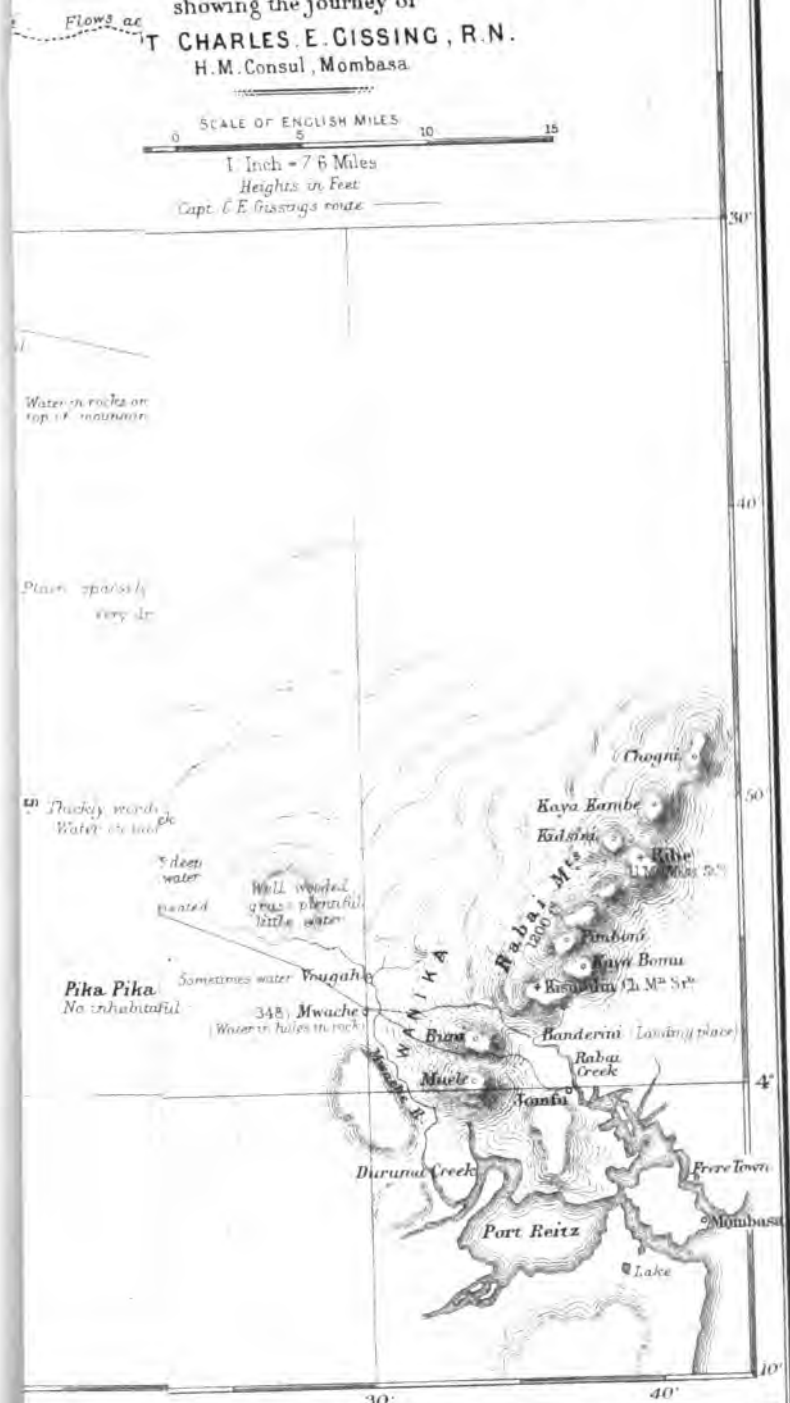
30° 40°

EAST AFRICA AND ADJOINING DISTRICTS

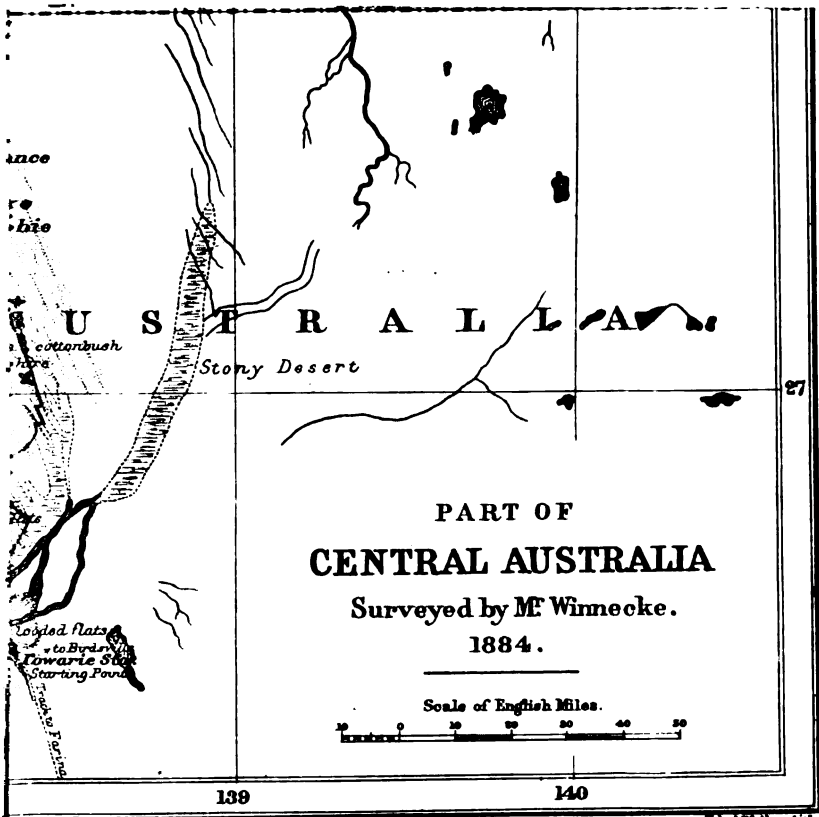
showing the journey of
T. CHARLES E. CISSING, R.N.
H.M. Consul, Mombasa

SCALE OF ENGLISH MILES
0 5 10 15

1 Inch = 7.6 Miles
Heights in Feet
Capt. C. E. Cissings route

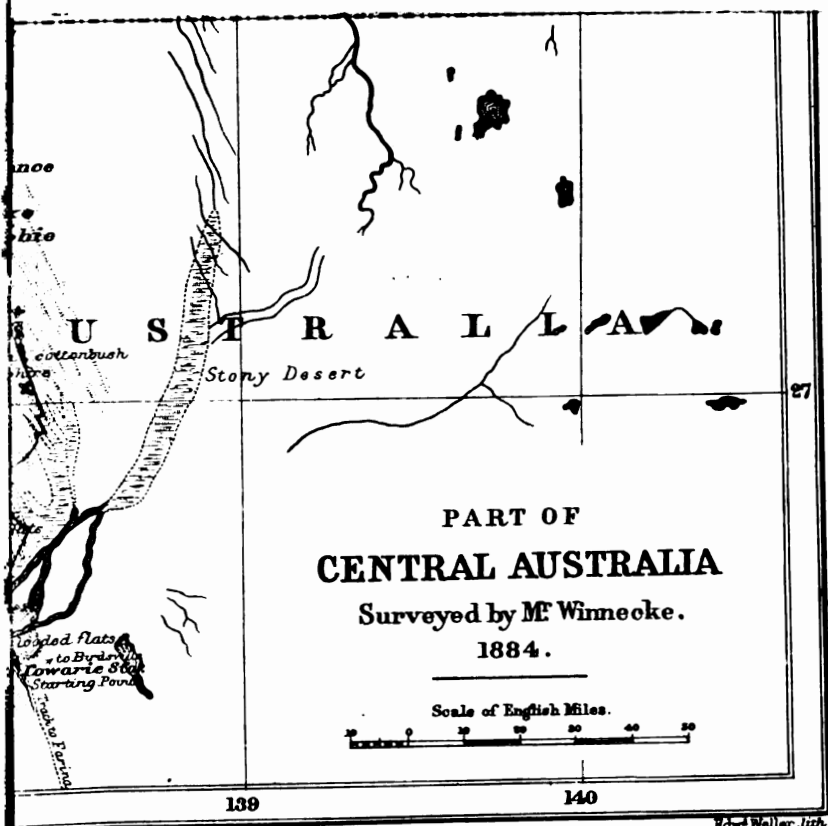






Edw^d Waller. lith.







PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

The Territorial Partition of the Coast of Africa.

By Sir RAWSON W. RAWSON, K.C.M.G., F.R.G.S.

Maps, p. 686.

At a time when public attention is being drawn to the distribution of political influence on the continent of Africa, and to the activity displayed by certain of the European Powers in acquiring territory, or extending their authority, on the coast, it is probable that a sketch map and a *résumé*, showing the extent held by each State and by the native tribes, will be useful for reference, and acceptable to the Fellows of the Royal Geographical Society.

Of the northern coast little need be said. France acquired her Algerian Province in 1830-37. Its coast-line extends from the borders of Morocco in long. $2^{\circ} 12'$ W. to that of Tunis in long. $8^{\circ} 36'$ E. Its inland boundaries are scarcely defined. The area is estimated at 122,900 sq. m., the population at 3,310,412. To this must be added the Algerian Sahara, of indefinite extent, and the District of M'Zab annexed in 1882, with an area of 38,600 sq. m., and a population vaguely estimated at 50,000. France assumed the Protectorate of the Regency, or Vilayet, of Tunis in the year 1882. Its coast-line extends eastwards to the border of the Vilayet of Tripoli in long. $11^{\circ} 20'$ E. Its area is about 42,000 sq. m. and population 1,500,000. Tripoli extends to the border of Egypt in long. $27^{\circ} 52'$ E. The only European Powers holding any possessions on the northern coast are France and Spain. Those, however, of the latter are very small and unimportant. They consist of the "Four Presidios," or garrisons, on the northern coast of Morocco, viz. Ceuta, Peñon de la Gomera, Alhucemas, Melilla, and the Chafarinas Is. Ceuta was captured by King John I. of Portugal in 1415, and came into the possession of Spain, together with the crown of Portugal, in 1580; and it was confirmed as Spanish in 1640. Melilla was captured in 1496.

Before entering upon a description of the western coast a short space
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may be devoted to an account of the first appearance and early settlements of European nations on the coast.

Slight credit is to be attached to the claim of France to have been the first European nation which established commercial relations with Western Africa, in the first half of the fourteenth century. The earliest reliable records of later discovery and permanent settlement commence in the years 1419-20, when Portugal took possession of Madeira, and Spain became the mistress of the Canary Islands. During that century Portugal alone engaged in the exploration of the coast southwards; but until late in the sixteenth century she did not attempt to acquire territory on the mainland, beyond erecting two forts, one at the Bay of Arguim, near Cape Blanco, in 1449, and one at Elmina, on the Gold Coast, in 1482. In 1575 she began her conquests, and the establishment of her present extensive colony of Angola, originally called Sébaste, on the West Coast.

The English and French appeared on the scene in the first half of the seventeenth century, the former on the river Gambia, the latter on the river Senegal. In 1618 an English company was formed for the purpose of penetrating into the interior to Timbuctu by the former river; and between 1664 and 1697 the French were actively engaged in pressing towards the same point by the route of the Senegal.

The Spaniards did not aim at forming settlements on the coast of Africa, beyond a few detached forts in Morocco, long since abandoned. Whether deterred by the Bull of Pope Alexander VI., or satisfied with her conquests in the New World, Spain did not seek for territory in this direction. In 1778 Portugal ceded to her the Island of Fernando Po, which she now holds, with a few insignificant islands, and a small strip on the mainland south of the Equator.

Holland at one time possessed a few unimportant settlements, or forts, on the coast of Guinea. She sold to England the last which remained to her in the year 1871. She now occupies only detached factories south of the Equator. She founded the colony of the Cape of Good Hope in 1652, which she retained, with the exception of a short period towards the end of last century, until 1806, when England took possession of it. Since that date its limits have been greatly extended.

Towards the end of the seventeenth century the Brandenburg African Company established settlements on the Gold Coast, and occupied several places, among others Friedericksburg, near Axim, in the year 1721. The Danes also had a few forts, or trading stations, on the same coast, of which evidence is extant in the name of Christiansborg, at Accra, bought from Denmark in 1850.

The accompanying map No. 1 will enable the reader to follow the annexed description of the territories held on the coast by African and European States, and by native tribes, commencing at the Straits of Gibraltar.

Latitude.	Longitude.		
35 54 N.	5 17 W.	Spain	has possessed <i>Melilla</i> since 1496 ; <i>Ceuta</i> since the year 1580.
28 21 "		Morocco	extends from the border of Algeria, in long. 2° 12' W. to <i>Wady Draa</i> , between which and <i>Cape Juby</i> lies the Port Santa Cruz la pequeña, or
27 58 "	12 52 "		
28 03 "		Spain.	<i>Puerto Cansado</i> , which was restored to Spain by the Treaty of Tetuan in 1860. This was exchanged in Oct. 1883 for a place called <i>Ifni</i> , which has since been occupied. The area of Morocco is 219,000 sq. m.; its population 5,000,000.
29 07 "			
27 52 "	12 53 "	Morocco.	<i>Matas de S. Bartolomé</i> , a small port, immediately S. of Cape Juby, was occupied by Mr. Donald Mackenzie, acting on behalf of Alderman Cotton and other London merchants about 1878, when they contemplated flooding part of the Sahara from the sea. The factory founded by him still exists.
32 40 "	17 00 "	Portugal	holds <i>Madeira</i> , <i>Porto Santo</i> , and the <i>Desertas Is.</i> , settled about 1419.
		Spain	holds the <i>Canaries</i> , on the 28th parallel, known to the ancients, but first occupied in 1427, and purchased by the Spanish Crown in 1478.
		Native	territory extends from Morocco about 720 miles, on a desert riverless coast, to the borders of the territory claimed by France.
16 00 "		Portugal	holds the <i>C. de Verde Islands</i> on the parallel of the <i>R. Senegal</i> , settled about the year 1460.
		France	claims to have had settlements on this coast in the 14th century, and to have reoccupied them in 1864. Her present territory, which includes <i>Senegambia</i> , was supposed to commence at the mouth of the <i>Senegal R.</i> , on which lies the capital <i>St. Louis</i> , and to extend about 165 miles* to the <i>Salum R.</i>
14 02 "			But in the latest official Report (1884),† France appears to claim the whole coast, to the extent of 970 miles, with certain exceptions hereinafter noted, as far north as <i>Cape Blanco</i> , and the Fort and Island of <i>Arguin</i> , ceded to her by the Netherlands in 1727; and as far south as <i>Mellicory</i> , ceded in 1865.
20 46 "			In the interior she has extended her power beyond
20 34 "			<i>Kita</i> , 320 miles from the coast, to the Upper Niger, where
9 08 "			
13 00 "	9 25 "		

* These distances are given in geographical miles.

† 'Notices statistiques sur les Colonies Françaises (Ministère de la Marine et des Colonies, 1884).'

Latitude.	Longitude.	
12 37 N.	7 55 W.	<p><i>Bamako</i> is in her possession, and a fort has been built. A railway from Upper Senegal to the Upper Niger has been begun, and ten miles of it have been completed. The French claim to have made treaties with the natives which place the territories along the Upper Niger, as far as Timbuctu, under their suzerainty.</p> <p>The area of the Colony is not known. The population is estimated at 191,608.</p> <p>The trade with France is on the increase. The exports to France have doubled between the years 1874-6 and 1880-2, and amounted in 1882 to 860,000<i>l.</i> They consist chiefly of ground-nuts, sesamum, palm-oil, coffee, gum-arabic, caoutchouc, ostrich feathers, wax, and ivory. The total exports from Senegal in 1880 amounted to 871,340<i>l.</i>, of which nine-tenths were shipped to France.</p> <p>Within the extreme limits claimed by France, and 180 miles south of the Senegal, lies the</p>
13 28 „		<p>England. <i>Gambia</i>, a British colony, capital <i>Bathurst</i>. England exercises jurisdiction at the mouth, and up the river <i>Gambia</i> 187 miles to <i>George Town</i> (McCarthy I.)</p> <p>Its area, including <i>British Combo</i>, is 6919 miles, and its population 14,150, with a coast-line of about 30 miles.</p> <p>The principal exports from the <i>Gambia</i> are caoutchouc, ground-nuts, gums, palm-oil, ginger, and pepper. Their value in 1882 amounted to 254,711<i>l.</i>; in the two preceding years they averaged 139,703<i>l.</i>, being less than the average of 1868-70.</p> <p>Native territory, known as <i>Native Combo</i>, extends a few miles south of the <i>Gambia</i>.</p> <p>On the southern side of</p>
12 36 „		<p><i>Casamanza R.</i> lies the Portuguese town and settlement of</p>
12 40 „	16 30 „	<p>Portugal. <i>Zeguichor</i> (or <i>Ziguinchor</i>) and further south <i>Portuguese Guinea</i>, consisting of three small detached districts, viz. :-</p>
12 07 „		<p>1. <i>Cacheo</i>, with settlements at the mouth of the</p> <p><i>S. Domingo R.</i>, declared a free port in 1869, and the town of</p>
12 28 „	15 12 „	<p><i>Farim</i>, up the river, 90 miles from the coast;</p> <p>2. <i>Bissao</i>, off the northern entrance of the <i>Geba R.</i>, and the town of</p>
11 40 „		<p><i>Geba R.</i>, up the river, 65 miles from the coast.</p>
12 10 „	14 25 „	<p>3. <i>Bolama I.</i>, and the I. of <i>Gallinhas</i>, at the mouth of</p>
11 29 „		<p><i>Rio Grande</i>.</p> <p><i>Bolama</i> was claimed by England, but awarded to Portugal under a Decree of Arbitration made by President Grant in 1870.</p>
11 40 „		<p>The area of Portuguese Guinea is 26½ sq. m.;</p>

Latitude.	Longitude.		
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			its population in 1873 was 9282. Its exports consist of wax, ivory, palm-oil, &c. Portugal claims from 13° 10' to 10° 20' N., the remnant of her original possessions extending formerly from Cape de Verde to Sierra Leone.
11 30 N.		Native.	The <i>Bissagos Is.</i> , with the exception of <i>Gal-linhas</i> , held by Portugal.
to			
11 00 "		France.	<i>Bissis I.</i> , to the north of the Bissagos Is., belongs to France, with
11 50 "			<i>Bissama</i> , on the Rio Grande;
11 45 "			<i>Cassini R.</i> , with Le Cerf and other factories;
11 30 "			<i>Nunez R.</i> , ceded in 1849, with Boko and other factories; and the mouth of
11 08 "			<i>Pongo R.</i> , ceded in 1866.
10 35 "		England	holds the
10 15 "			<i>Los Is.</i> , north of Mellicory, and the coast, S. of <i>Mahala Creek</i> * (north of
9 27 "			<i>Scarcies R.</i>) to
8 55 "			<i>Sierra Leone</i> , capital Free Town, in which colony are included
8 30 "			<i>Sherbro Island</i> , and
7 25 "	12 30 W.		<i>Turner's Peninsula</i> . The latter, as far as <i>Camalay</i> , was annexed by a Treaty in 1825, recently renewed by the native chiefs. From <i>Camalay</i> to
7 20 "			<i>Mannah R.</i> , the boundary of Liberia, the coast has been annexed by agreements made in 1882-83.
			The area before the annexations of 1883 was stated at 468 sq. m., but Behm and Wagner † estimate it at more than double. The population was 606,546. The coast-line extends 50 miles.
			The exports from Sierra Leone amounted in 1882 to 420,017l., of which 45 per cent. was shipped to England. They have decreased within the last ten years.
4 22 "	7 35 "	Liberia	is a free Negro republic, founded by an American Colonisation Society in 1822, and declared independent in 1847. Capital, <i>Monrovia</i> . It stretches beyond
	6 00 "		<i>Cape Palmas</i> , with a nominal authority to the eastern boundary of Maryland on the
4 55 "	6 00 "		<i>S. Pedro R.</i> for about 350 miles. It penetrates inland from 30 to 60 miles. Its area is stated to be 14,300 sq. m. (Behm and Wagner † 18,950 sq. m.), and estimated population 767,500. Its principal exports consist of palm oil and nuts, coffee, dyewoods, ivory, sugar and other colonial produce, and are shipped to England, Holland, Hamburg, and the U. States.
		Native	territory extends 135 miles. Kroo country.
		France	holds territory on the Gold Coast from <i>Grand Bassam</i> , ceded in 1842, for the distance of about 30 miles, to
	3 50 "		

* This and one or two other positions have been inserted since the map was printed.

† In Petermann's 'Mittheilungen.'

Latitude.	Longitude.	
	3 20 W.	<i>Assinie R.</i> which was first occupied in 1838, ceded in 1843, and abandoned in 1870-2, but has been recently reoccupied. The area is undefined.
		England. From the <i>Assinie</i> the colony of the <i>Gold Coast</i> (first settled in 1661), extends 250 miles east to
	1 00 E.	<i>Quitta</i> (Keta), and the country is under British protection to the end of the <i>Aflao</i> country, at
	1 15 "	<i>Flohow</i> (or <i>Poroora</i> h). In 1850 the Danish forts of <i>Quitta</i> and
	0 10 W.	<i>Accra</i> (the latter the present seat of Government), were purchased from Denmark for 10,000 <i>l.</i> The total area is 15,000 sq. m.; the population 400,000.
		Germany. Between <i>Quitta</i> and Great Popo Dr. <i>Nachtigal</i> is reported to have planted the German flag at <i>Beh Beach</i> and <i>Bagidah</i> , to which must now be added
	1 35 E.	<i>Porto Seguro</i> .
	1 32 "	<i>Bagidah</i> is marked in the latest German map (Kiepert, 1894) as a German Protectorate. <i>Aflao</i> is not marked on any general map, but appears in a Colonial Map of the <i>Gold Coast</i> , 1879.
	1 22 "	It may be noted here that the North German Missionary Society commenced work among the <i>Ewe</i> tribes in 1847, establishing itself at <i>Peky</i> , in the interior. The chief station was removed to <i>Quitta</i> in 1854.
6 28 N.	0 20 "	Dahomey has 35 miles of coast, extending from
	1 58 "	<i>Pulloy</i> to
	2 27 "	<i>Cotanu</i> , (Katanu), or <i>Appi</i> . Midway lies its Port,
	2 06 "	<i>Whydah</i> . <i>Dahomey</i> expands widely inland, and has an area of 12,800 miles.
		Portugal possesses here a ruined fort, <i>St. Jean Baptiste d'Ajuda</i> , erected in the year 1680.
	2 00 "	France acquired about five miles of coast by treaty in 1868 at <i>Cootenoo</i> , which was formerly the slave port of <i>Porto Novo</i> , and has lately reoccupied it.
	2 36 "	England. The Colony of <i>Lagos</i> , ceded to England in 1861, was annexed to that of the <i>Gold Coast</i> in 1874. Including the protected territory, it extends from <i>Cotanu</i> , on the west, beyond <i>Leckie</i> , to
	4 44 "	<i>Odi</i> . The area of the <i>Gold Coast</i> , including <i>Lagos</i> (73 sq. m.) is 6073 sq. m.: including protected territory it may be 15,073. The population is estimated at 475,270, of which 75,270 are in the <i>Lagos</i> district. The annual value of exports from the <i>Gold Coast</i> in 1880-82 has averaged 398,000 <i>l.</i> and from <i>Lagos</i> 539,000 <i>l.</i>
		Native territory, on the <i>Benin</i> coast, extends 380 miles to the
4 00 "	9 38 "	<i>Cameroons R.</i> , within which range British

Latitude. ° ' "	Longitude. ° ' "	
5 50 N.	5 10 E.	influence has long been supreme. From the mouth of the
4 30 "	8 25 "	<i>Benin R.</i> to that of the
		<i>Old Calabar R.</i> , including the rivers <i>Brass</i> , <i>New Calabar</i> , <i>Bonny</i> , and <i>Opobo</i> , all within the Delta of the Niger, the trade has been carried on exclusively by British merchants. The exports consist chiefly of palm-oil and kernels. On the
4 18 "	6 08 "	<i>Lower Niger R.</i> , and its great affluent, the <i>Benue R.</i> , the trade is now entirely in the hands of the British "National African Company." The outlet and lower course of the Niger were discovered by the English traveller, J. Lander, early in the present century. In 1840-41 the British Government sent an expedition to open up the river, and established a settlement at
7 45 "	6 52 "	<i>Lokoja</i> , at the confluence of the Niger and <i>Benue</i> rivers, 300 miles from the sea, where a Consul was appointed, and resided for some years. It subsequently voted an annual subsidy in aid of the efforts made to introduce British commerce on the river, and in 1854-58 the Admiralty caused the river to be surveyed. Up to 1879 the trade was carried on by British merchants only, but in that year, and in 1882, two French companies entered the river, but have since retired. The Company has its depôt, <i>Akassa</i> , at the mouth of the <i>Nun</i> branch, and nearly 100 stations or factories up the two rivers, extending to
10 15 "	4 25 "	<i>Boussa</i> , on the Niger, 600 miles from the sea, where the navigation is first interrupted by falls, and to
9 15 "	12 30 "	<i>Yola</i> , on the <i>Benue</i> , 750 miles from the sea. From <i>Boussa</i> to <i>Timbuctu</i> , on the Upper Niger, is about 1000 miles.
		The principal exports, besides those above mentioned, consist of ground-nuts, shea-butter, beniseed, and ivory.
		England. Treaties have recently been made with various chiefs along the coast from <i>Benin R.</i> to
4 00 "	9 14 "	<i>Victoria</i> , in <i>Ambas Bay</i> , which was annexed in July last, extending ten miles on the coast, and seven miles inland.
		Germany has lately established her protectorate at several places in the Cameroons country. The latest German map (Kiepert, Sept. 1884), marks as under the protection of Germany the <i>Cameroons R.</i> , <i>Dualla</i> (coast on south side of that river), <i>Belltown</i> , <i>Dido's Town</i> , <i>King Akway's Town</i> ; <i>King William's Town</i> , or <i>Bimbis</i> , 25 miles west of the Cameroons; with <i>Melimba</i> , 20 miles south, and <i>Little Batanga</i> , 65 miles south of the Cameroons, a territory extending from 4° to 2° 56' N., and embracing 100 miles of coast.
3 38 "		
3 15 "		

Latitude.	Longitude.	
	2 52 E.	France. <i>Great Batanga, or Banoko, was ceded by the native chiefs to France, under a Treaty dated 20th March, 1862.</i>
3 30 N.	8 48 „	Spain holds the Island of <i>Fernando Po.</i> , ceded to it by Portugal in 1778. This was occupied as a military post by England in 1827-34, and abandoned on account of its unhealthiness.
1 35 „	7 24 „	Portugal holds two islands, <i>Prince's I.</i> and <i>St. Thomas'</i> , both settled in 1470.
0 15 „	6 35 „	Native. The Banaka tribe hold the coast from the Cameroons south for 105 miles, within which lies <i>Little Batanga</i> , already mentioned as annexed by Germany.
1 00 „		Spain holds a small strip on both sides of the <i>Muni R.</i> , called <i>San Juan</i> , extending 35 miles on the coast; and off it, in Corisco Bay, <i>Corisco I.</i> , and further south the <i>Elobey Is.</i> together with <i>Annobon I.</i> further from the coast, S.W. of Prince's Island.
0 50 „		The area of Spanish territory, including the I. of Fernando Po, is 860 sq. m.; the population 35,000.
0 52 „		France holds 200 miles of coast from Corisco Bay to within a short distance of Cape Sta. Catharine, including the <i>Gaboon</i> , ceded in 1844.
1 25 „	5 35 „	The area of the French territory at the Gaboon and Gold Coast is 7722 sq. m., the estimated population 186,133. The trade of the Gaboon amounts to 120,000l. a year. The exports consist of ivory, caoutchouc, ebony, and red dye-wood.
0 05 N.		<i>Ogowé R.</i> France first acquired rights of sovereignty on this coast, at Cape Lopez and northward, in 1862. It is too soon to define the limits of the territory, or the nature of the jurisdiction, acquired by France in the region of the <i>Ogowé</i> through the operations of Lieut. de Brazza in 1882-84; but it may be mentioned that 15 out of 24 contemplated stations have already been founded, viz.
0 45 S.		3 on the coast, <i>Landana, Punta Negra, and Cape Lopez</i> ; 1 in the valley of the <i>Kwilu, Ngotu</i> ; 7 on the <i>Ogowé, Lambarene</i> (Missionary), <i>Njole</i> (Customs Post, 200 miles up the river), <i>Lopé, Boué, Mramba, Niadi, and Franceville</i> (capital of the French territory); 2 on the R. <i>Alima, Alima-Duele and Alima-Leheti</i> ; and 2 on the Congo, <i>Brazzaville</i> , below <i>Stanley Pool</i> , and <i>Nganshemo</i> , 70 miles beyond it, both on the right bank.

Latitude.	Longitude.	
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		It is stated that the territory has been divided into three districts under Government officers, and named Alima, Upper and Middle Ogowé.
		The extent, and the position of the stations are shown in the accompanying map (No. 2) which embraces also the stations of the International Association. The French Government subsidised M. de Brazza with a grant of 51,000 <i>l.</i> , and with arms, ammunition, and transport material.
		Native territory, abounding in European factories, extends 450 miles from near C. Ste. Catherine to the recognised border of the Portuguese territories at
7 55 S.		Portugal. <i>Ambriz</i> . Portugal claims as far north as <i>Landana</i> , occupied in 1883 under treaty with the natives, including the mouth of the Congo; but this, though repeatedly recognised by France, has never been admitted by England.
5 12 "		Following the coast downwards from C. Ste. Catherine there are in the territory of the Kamma, or Nkomi, at least six English factories and one Portuguese.
		England.
		Portugal.
		France. The points recently occupied by the French on this coast are
3 20 "		<i>Yumba</i> (Mayumba),
4 40 "		<i>Loango</i> , and
4 50 "		<i>Black Point</i> (Punta Negra).
		Holland Has five factories on the Congo, at Banana, Ponta da Lenha, Boma, Noki, and Nsuka; eleven north of the Congo, viz. Moanda, Vista, Kabinda, Futila, Landana, Insono, or Chiloanga, Massabe, Kaiijo, Chissombo, on R. Loema, Kwilu, and Mayemba on the Kwilu; and eight south of the Congo, viz. Cabeça de Cobra, Quinzao, Macúla, Ambrisette, Muserra, Ambriz, Dande, and Loando. The head-quarters are at <i>Banana</i> . The station at <i>Chinchosho</i> appears to have been abandoned.
		There are English, Dutch, French, and Portuguese factories on the
4 30 "		<i>Kwilu R.</i> The German factory is 28 miles up the river; the Dutch factory on Reis I., and the others at the mouth.
		The International Association. The limits of the territory claimed by this body are equally undefined, and the question of its international position is now under discussion, but the Map (No. 2) shows the limits and position of the stations which it has established, 39 in number, extending from
1 45 "		<i>Egowe</i> , near C. Ste. Catherine, where the French territory ends, to the mouth of the
6 00 "		<i>Congo R.</i> , and up that river, a distance of about 1300 miles, as far as
0 10 "	25 20 E.	<i>Wana Rasani</i> , occupied in 1883, at the foot of

Latitude. ° ' "	Longitude. ° ' "	
		<i>Stanley Falls</i> , of which the position is shown in Map No. 1.
		Following down the coast, it possesses stations at
2 40 S.		<i>Sette-Kamma</i> , where there are other English factories;
3 00 "		<i>Nyanga</i> , on the river of that name; and
3 20 "		<i>Mayumba</i> , where the French have also a station. At the mouth of the
4 30 "		<i>Kwilu R.</i> , where the Association is said to exercise sovereign rights, there are the 2 stations of <i>Rudolfstadt</i> and <i>Grantville</i> ;
		3 further up the river, viz, <i>Baudouinville</i> , <i>Kitabi</i> , and <i>Franktown</i> ;
		1 on the R. Luete (or Luisa), viz. <i>Sengi</i> or <i>Madembe</i> ;
		3 on the R. Niadi, viz. <i>Stanley-Niadi</i> , <i>Stephanie-ville</i> , and <i>Philippeville</i> ;
		2 between the Niadi and the Congo, viz. <i>Bulangungo</i> and <i>Mhokko-Songho</i> ; and
		1 on the upper Luemma, <i>Nkula</i> .
		Besides the Kwilu and the Congo it does not hold any stations on the coast. The first station on the Congo is .
5 41 "	13 10 E.	<i>Boma</i> , which is 65 miles from the mouth. Besides it, the Association holds 4 other stations on the right bank of the Congo up to
4 00 "	16 00 "	<i>Stanley Pool</i> , which is 280 miles from the mouth. These are <i>Ikungula</i> , <i>Vivi</i> (which is the highest point approachable by water), <i>Isanghila</i> , and <i>Manyanga</i> .
		On the left bank it holds 6 stations, viz.—
5 43 "	13 45 "	<i>Noki</i> , which is 100 miles from the mouth, and just outside the limit of the Portuguese territory recognised in the recent negotiations with that Government, <i>Nuamposo</i> , <i>Ruby-town</i> , which is at a little distance from the river, <i>Lutete</i> , <i>Ngombi</i> , and <i>Ngoma</i> .
4 12 "	15 48 "	<i>Leopoldville</i> , at the entrance of Stanley Pool, is the head-quarters of the Association, which has two other stations, <i>Kinshasha</i> and <i>Kimpoko</i> , on the southern side of the Pool.
		On the Middle Congo are 6 stations, viz. <i>Msuata</i> , <i>Kuamouth</i> , <i>Bolobo</i> , <i>Lukolela</i> , <i>Equator Station</i> , which is 650 miles up the river, and
		<i>Wana Rasani</i> , which is the last existing station before reaching
0 10 "	25 20 "	<i>Stanley Falls</i> , on the Upper Congo. Other stations are in process of formation, among them one at the mouth of the
1 10 N.	23 30 "	<i>Aruwimi R.</i>
		In the Congo Estuary, and up the navigable part of the river, various nations occupy factories by treaty or by sufferance.

Latitude.	Longitude.	
		Native territory extends 120 miles south of the Congo, to Ambriz, but is claimed by Portugal.
		Portugal. Her territory, commencing from 5° 12', or from 8° (7° 55'), as above noticed, extends south to
18 30 S.		<i>Cape Frio.</i> The Province of <i>Angola</i> is divided into 3 Districts, <i>Loanda</i> , <i>Benquela</i> , and <i>Mossamedes</i> , extending over 800 or 1000 miles of coast, according to the determination of its limits. The area claimed is 312,509 sq. m.; the population is estimated at 2 to 3,000,000. The imports into Portugal for home consumption from all her African Colonies averaged in 1879-81 153,000 <i>l.</i> The imports and exports of the Province of <i>Angola</i> were in 1876-77,* 218,540 <i>l.</i> and 205,714 <i>l.</i> respectively.
		Damaraland, Namaqualand (Great) and occupied by native tribes of those races, and split up into a number of independent districts, ruled by native chiefs, extend from C. Frio to the
28 30 "		<i>Orange River</i> , which is the boundary of the British Colony of the Cape of Good Hope, a distance of 730 miles. The area is unknown; the population of the three countries was estimated in 1876 at 98,000, 121,500 and 16,850 respectively.
		England. Upon this coast England occupies a few widely detached guano islands, called the <i>Penguin Is.</i> , annexed in 1867, and incorporated with the Cape Colony in 1874, extending from
24 40 "		<i>Hollamsbird I.</i> to
26 36 "		<i>Sinclair's I.</i> (or Roast Beef I.); also
26 15 "		<i>Schaboe I.</i> , occupied in 1861, and
23 00 "		<i>Walvisch Bay</i> , for an extent of 40 miles, annexed by the Cape Colony in 1878.
26 37 "		<i>Angra Pequena</i> which is on the mainland close to <i>Penguin I.</i> , one of the group annexed in 1874, has been for a long period frequented by traders from the Cape, but not annexed. Since 1883 the Lüderitz German trading station has been established there, and a recent German map published by Perthes, claims as "Lüderitzland" a territory extending from the British boundary on the Orange R. to some distance north of <i>Angra Pequena</i> , about 120 miles in length, through which runs the road from that settlement to Bethany, and other stations of the Rhenish Mission in the interior. Capt. Aschenborn, of the <i>Nautilus</i> gunboat, hoisted the German flag at <i>Angra Pequena</i> in Jan. 1884.

* No later information is available.

Latitude.	Longitude.	
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		Germany, within a few months or weeks, is reported to have planted her flag at <i>Cape Frio</i> , the northern limit of Damaraland; <i>Cape Cross Bay</i> ; <i>Sandwich Harbour</i> , where are said to be some Cape Town fisheries;
18 30 S.		<i>Spencer Bay</i> , off which lies <i>Mercury I.</i> , one of the Penguin group annexed in 1874, and <i>Angra Pequena</i> , and to contemplate, or to have completed, the annexation of the whole coast from C. Frio to the Orange R., with the exception of the territory at Walvisch Bay annexed by the Cape Colony in 1878.
21 45 "		
23 40 "		
25 30 "		
26 37 "		
		England claims about 100 miles of coast immediately to the south of Angra Pequena, as the property of Capt. Sinclair, purchased from David Christian, Chief of Bethany. From this to the Cape Colony is about 45 miles. The Colony of the <i>C. of Good Hope</i> extends from the Orange River round the Cape to the <i>Tugela R.</i> , the northern boundary of Natal on the Eastern Coast, including certain protected and disputed Native Territories.
29 12 "	31 26 E.	This Colony, first settled by the Dutch in 1652, had extended eastward as far as the <i>G. Fish River</i> under the Dutch rule. It was captured and retained by England in 1806. The colonial border was extended to the <i>Kei R.</i> in 1846. British Kaffraria was annexed in 1866, Basutoland in 1868, and the Transkeian Districts, including nearly the whole of the region between the Kei and Natal in 1880. In the same year Griqualand was annexed. The area of this extensive territory is 239,305 sq. m., the population 1,155,168. These figures include Basutoland which was annexed in 1875, and disannexed in 1883, and which is now under the administration of the Imperial Government; its area is 10,290 sq. m., and its population 128,000.
33 30 "	27 10 "	<i>Natal</i> , having as its southern boundary the <i>R. Untamvuna</i> , was first occupied by a British force in 1838, proclaimed a British Colony in 1843, and constituted a separate Colony in 1856; its area is 21,000 sq. m., and population 416,219.
32 40 "	28 30 "	The exports of the Cape Colony averaged in 1880-82 4,494,000 <i>l.</i> , exclusive of diamonds, which averaged in the same years 3,845,000 <i>l.</i> , those of produce having more than doubled since 1868-70. Those of Natal increased during the same period from 339,000 <i>l.</i> to 796,800 <i>l.</i> The imports into the Cape during the same years have increased in a much greater ratio, viz. from 2,155,000 <i>l.</i> to 9,175,000 <i>l.</i> , and those into Natal from 376,000 <i>l.</i> to 2,154,000 <i>l.</i>
31 12 "	29 54 "	Half of the produce exported from the Cape

Latitude.	Longitude.	
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		consists of sheep's wool; one-fourth of ostrich feathers, and the remainder of sheep and goat skins, angora hair, copper ore, &c. The export of wine is insignificant and diminishing.
		Of the produce exported from Natal three-fifths consist of sheep's wool, one-fifth of raw sugar, and hides and ostrich feathers form the principal part of the remainder.
		The length of coast, from the Orange R., round by the Cape of Good Hope, to the northern boundary of Natal, is 1320 miles.
26 35 S.		Zululand. The coast-line extends from Natal to the border of the Portuguese territory, south of <i>Delagoa</i> (or Lorenzo Marques) Bay, a distance of 190 miles. The area is 15,921 sq. m., the population 150,000.
25 58 "		Within these limits King Panda ceded to England in 1843
		England. <i>St. Lucia Bay</i> , and the mouth of the <i>Umvoloosi R.</i> , running into it.
28 29 "		Inland, adjoining the Cape Colony and Zululand, lies
		The Orange Free State. Founded by Boers who quitted the Cape Colony in 1836; declared independent in 1854, with an estimated area of 41,482 sq. m., and a population of 133,518. The principal exports are sheep's wool, hides, and ostrich feathers, but as they pass through the ports of the Cape and Natal, their value cannot be stated.
		The Transvaal, called by the Boers the "South African Republic," lies to the north of Natal; was founded by Boers who emigrated from Natal when it was proclaimed a British Territory. The inland limits are not defined. It is bounded on the east by Zululand and the Portuguese territory. The area is estimated at 115,000 sq. m., the population at 914,930. But the estimates of native population in this and other African countries are very untrustworthy. The exports, consisting of wool, cattle, hides, grain, ostrich feathers, ivory, butter, gold and other minerals, are estimated under 500,000 <i>l.</i> The value of gold exported from 1873 to 1882 was 355,468 <i>l.</i>
		Portugal claims an extent of 1260 miles of coast from <i>Delagoa Bay</i> to <i>Cape Delgado</i> . The seat of government is in <i>Mozambique I.</i> <i>Delagoa Bay</i> , claimed by England, was awarded to Portugal, under a decree of arbitration by the President of the French Republic in 1875. The area of the Mozambique possessions of Portugal is stated at 382,683 sq. m., the population at 350,000. The imports and exports of this colony were valued in 1876-77* at
10 40 "		
15 02 "		

* No later information is available.

Latitude.	Longitude.		
			263,595 <i>l.</i> and 253,311 <i>l.</i> respectively. The first settlement of the Portuguese on this coast dates from 1501, upon the return of the first vessels of that nation which reached India round the Cape of Good Hope.
17 06 S.		Native.	Within the Portuguese limits, between the <i>Quizungo R.</i> and <i>Antonio R.</i> ,
15 56 "			a distance of 100 miles, lies the native state of <i>Angoche</i> , or <i>Angora</i> , which has never submitted to Portuguese authority.
			Parallel with the Portuguese territories, and extending almost the whole length, is the <i>I. of Madagascar</i> , at a distance of 250 to 500 miles from the coast. The area of this and of the small islands adjoining is 228,558 sq. m., the estimated population 2,500,000. On the W. side lies the island of <i>Nossi-bé</i> , annexed by France in 1843, under a treaty dated in 1841, and on the east side <i>I. St. Marie</i> , first occupied by France in 1750, but not settled till 1821. The area of these two islands is 113 sq. m., the population 14,372, equally divided between the two. The exports of <i>Nossi-bé</i> amounted in 1881 to 150,480 <i>l.</i> ; those of <i>St. Marie</i> to 4400 <i>l.</i>
13 28 "	48 15 E.	France.	
17 00 "	50 00 "		
		Native.	Between Madagascar and the mainland lie the Comoro Is. including Great Comoro, Mohilla, Johanna and
12 55 "	45 15 "	France.	<i>Mayotte</i> . The last is French; annexed in 1843, under a treaty dated in 1841. Its area is 141 sq. m.; its population 9617. Its trade is not stated. It receives a subsidy of 2000 <i>l.</i> a year from France.
			Further north are the
5 50 N.	53 00 "	England.	<i>Amirantes</i> , small islands, dependencies of the British Colony of Mauritius.
		Zanzibar.	The authority of the Sultan extends from the confines of the Portuguese territory to beyond the Jub R., to
2 20 "	45 54 "		<i>Warsheikh</i> , a distance of 1050 miles, and is recognised to a considerable distance in the interior, following the trade routes.
6 12 S.	39 11 "		<i>Zanzibar Island</i> has an area of 625 sq. m. and a population variously estimated from 150,000 to 200,000. The exports in 1880 amounted to 870,350 <i>l.</i> , and in 1882 to more than 1,000,000 <i>l.</i> They consist of ivory, orchilla, cloves, caoutchouc, hides, &c. The trade is carried on with Great Britain, India, Arabia and Persia, Germany, and the United States.
			The island was taken by the Imaum of Muscat in 1784, but the Sultan is now independent.
11 52 N.	51 18 "	Somaliland.	From Warsheikh northward to <i>Cape Guardafui</i> , and thence westward to the <i>Gulf of Tajura</i> , an extent of 1300 miles, and embracing an area of about 175,000 sq. m., the country is occupied by the Somali race.

Latitude.	Longitude.		
° ' "	° ' "		
		Egypt	acquired from Turkey in 1875 the administration of the port of <i>Zeyla</i> , the then recognised limit of Turkish power, and extended her authority over the Somali coast beyond <i>Berbera</i> ; but she has recently retired from this coast. There is now a British agent at <i>Berbera</i> .
10 30 N.	45 00 E.		At the mouth of <i>Tajura Bay</i> lies <i>Mushah I.</i> , and off <i>Zeyla</i> , in <i>Tajura Bay</i> , lies the small island of <i>Aubad</i> (or <i>Efat</i>), both acquired by England in 1839.
11 43 "	43 12 "	England.	
12 30 "	54 11 "	Native.	Off <i>C. Guardafui</i> , at a distance of 148 m. lies <i>Socotra I.</i> , occupied by the Indian Government in 1834, but abandoned in 1839 on the occupation of Aden. By a treaty of January 1876, the Sultan engaged, for a small subsidy, never to cede the island, or allow a settlement on it, without the consent of the British Government. Its area is about 1300 sq. m. The population is thin and the trade insignificant.
11 58 "	43 17 "	France.	<i>Obokh</i> , an insignificant village of mud huts, with small environs, but with a well sheltered anchorage, was purchased in 1862, by the French, from the Sultan of <i>Raheita</i> for the sum of 2000 <i>l.</i> , as a convenient locality for establishing a commercial port in rivalry with the native ports of <i>Tajura</i> , <i>Zeyla</i> , and <i>Berbera</i> , and the British port of <i>Aden</i> on the opposite coast, and providing a coaling station and strategical point for French vessels passing through the <i>Suez Canal</i> . It is, however, only within a year that the French Government have taken steps to utilise it. In Dec. 1880 the French Government publicly notified that the Treaty of 1862 did not contain any indication of the area or limits (<i>périmètre</i>) of the territory, and that the Government had taken no steps to assert its sovereignty over it. <i>M. D. de Rivoire</i> cites the area as 9½ m. territory extends between <i>Tajura Bay</i> and <i>Ras Shakhs</i> , the southern boundary of <i>Egypt Proper</i> , a distance of 230 miles. Within this territory <i>Egypt</i> in 1866 exercised authority near <i>Massowah</i> .
14 37 "	41 10 "	Native	
15 38 "	39 28 "		
13 00 "	42 44 "	Italy	claims a small territory in <i>Assab Bay</i> , 45 miles within the entrance of the <i>Red Sea</i> , with a coast-line of 40 (?) miles, first sold in 1869, and then to Messrs. <i>Rubbattino</i> in 1879. It was officially occupied in Jan. 1881. Its area is 244 sq. m. Its population, distributed over 6 villages, is 1303.
12 39 "	43 25 "	England.	<i>Perim I.</i> , in the Straits of <i>Bab-el-Mandeb</i> , at the entrance of the <i>Red Sea</i> , was occupied by England in 1855, for the purpose of preventing an interruption to the free passage of her shipping through the Straits.

Latitude.	Longitude.	
° ' "	° ' "	
		Its area is 4½ sq. m.; the number of its population is unknown.
		Egypt. From Ras Shakhs to Suez, and thence backward and round Ras Mahommed up to the head of the
29 31 N.	34 58 E.	<i>Gulf of Akabah</i> , Egypt holds undisputed possession, but at <i>Suakim</i> England now exercises temporary authority.
19 7 "	37 20 "	At a distance of 170 miles up the Red Sea, close to the Arabian coast,
		England holds the
		<i>Kumaran Is.</i> , occupied for purposes connected with the laying of the telegraph cable in the Red Sea. Their area is 64 sq. m., and population about 500.
		Egypt. Finally, from the head of the Gulf of Akabah, the boundary of Egypt runs in an almost straight line, and a north-westerly direction, to
31 7 "	33 48 "	<i>El Arish</i> , on the Mediterranean.
		The coast-line from Ras Shakhs to Suez, and thence round Ras Mahommed to the head of the Gulf of Akabah is 1500 miles; thence to El Arish 125 miles, and along the coast of the Mediterranean to the boundary of
	27 52 "	<i>Tripoli</i> , 340 miles, in all 1965 miles. Any Egyptian territory within the continent of Asia does not fall within the scope of this paper.

The area and population of Egypt Proper, divided into its three districts, were in 1877 :

	Area sq. m.	Population.
Lower Egypt	86,482	3,385,766
Middle "	62,290	653,119
Upper "	245,572	1,471,398
Towns: Massowah .. ..	..	2,744
Suakim .. ..	..	4,600
Total	394,344	5,517,627

The same of the Soudan :

Kordofan	41,807	278,740
Darfour	174,511	4,000,000
Remainder of the Soudan and Province of the Equator .. ..	..	6,500,000

The Census of 1883 gives 6,798,230 as the number in Egypt Proper at that date.

The imports in 1883 were 8,596,976*l.*; the exports 12,309,885*l.* The excess of exports over imports from 1874 to 1883 was 62,500,000*l.* Of the exports in 1883 65 per cent. were shipped to England. Chief exports: cotton wool and seed, beans, maize, and sugar.

The following is a summary of the approximate extent of coast-line occupied by the natives, and occupied or claimed by the several countries of Europe, or in the case of Germany reported to be claimed; assuming the total extent, exclusive of all islands, to be 16,718 miles.

Northern Coast.	{	Egypt 840	}	4,370
		Tripoli 1080		
		France 1180		
		Morocco 1770		
Western Coast to Cape of Good Hope.	{	France 1155	}	5,967
		England 1117		
		Portugal 800		
		Spain 35		
		Germany 270?		
		Liberia 350		
		Dahomey 35		
		Other Natives .. 2205		
Eastern Coast, from Cape of Good Hope to Suez.	{	England 900	}	6,381
		Portugal 1160		
		France 4?		
		Italy 40?		
		Egypt 1657		
		Zululand 190		
		Zanzibar 1050		
		Other Natives .. 1380		
Total				16,718 miles.

And without reference to locality :

European.	{	England .. 2017	}	Native.	{	Egypt .. 1997
		France .. 2339				Tripoli .. 1080
		Portugal .. 1960				Morocco .. 1770
		Spain .. 35				Liberia .. 350
		Germany .. 270?				Dahomey .. 35
		Italy .. 40?				Zululand .. 190
6661 miles.					Zanzibar .. 1050	
					Various tribes 3585	
					10,057 miles.	

It is scarcely necessary to say that the above has been compiled from a large number of authorities, more or less reliable, but the best and latest that are accessible; and I desire to express my acknowledgments for valuable information and suggestions to Mr. Ravenstein, and to a very full and accurate article in the *Times* of the 15th Sept., entitled "The Scramble for Africa." Those who wish to view the political aspect of some of the recent acquisitions on the Western Coast may consult the latter with advantage. In conclusion I deem it necessary to disclaim for the above statements any official, or other responsible, authority.

Journey from Mozambique to Lakes Shirwa and Amaramba.

By H. E. O'NEILL, H.M. Consul at Mozambique.

PART I.—FROM MOZAMBIQUE THROUGH THE MAKUA AND LOMWE COUNTRIES
TO LAKE SHIRWA, JUNE TO SEPTEMBER 1883.*

(Read at the Evening Meeting, April 28th, 1884.)

As stated in his letter to the Society, published in the 'Proceedings,' 1883, p. 482, Mr. O'Neill made his final start from the coast (the village of Ngambo, near Mozambique) on the 11th of June, 1883. He travelled by a path leading to Mbadu, which he found, on the 14th, joined the road from Bwibwi to the same place. He spent several days (15th to the 20th of June) at Mbadu, and on leaving it, after five days' march, reached the Tugwi Hill; his diary then continues as follows:—

June 25th.—I notice a great increase in the population here and in the Nagulue district. It is due to the fact that this trade route is attracting to it people from the neighbouring country. A few years back the traveller marched for five and six days, from Bwibwi and Mbadu to Shalawe, through an unpopulated district. Now he may break his journey at Kutugula and Tugwi, food for his men being procurable at these points. Nearer the coast, the path from Ngambo to Mbadu has been disused for the past twelve months, in consequence of the raids of the Makua chief Namaralo, and is now so overgrown as to be impenetrable. The depredations of this lawless chief, who resides some little distance W.S.W. of Moza Mountain, have been the curse of the country in the neighbourhood of Mozambique for the past eight years. In 1875 or 1876 he waged war upon the tribes west of Fernão Veloso Bay, devastating the whole country up to its northern branch Nehegehe, and driving the inhabitants across that inlet to the peninsula of Mwambakoma. These raids have inspired so great a terror that the whole coast-line west of Nakata still remains depopulated and desolate, the people fearing to return to their former homes. Less than a couple of years ago he had the audacity to swoop down upon Ampapa, on the Bay of Mozambique, almost within cannon-shot of the capital of the province, causing a general flight to the island; although he was driven back by the Portuguese troops, no attempt was made to follow him up and inflict such a punishment as would put a stop to any further raids.

The stagnation in agriculture and in the general development of the country immediately west of Mozambique is in great part due to the feeling of insecurity caused by his still being at large. The blighting influence exercised by his outrages I now find extends so far south as to ruin the most direct route from Ngambo westward. I am very glad

* Mr. O'Neill's map will be published with Parts II. and III. of his paper in the December number.

to be able to say that a strong effort is about to be made by the present Governor-General to break once and for all the power of this chief, and to place in his stead another more lawfully disposed and owning allegiance to the Portuguese Government.

27th.—Crossed the Ngambo river flowing north-easterly, 10 miles (approx.) west of Tugwi. Three hours' further march brought us to the same river flowing south-easterly from its sources in the neighbouring hills Kugue, Erewe, and Ndimwe. Camped on left bank in lat. $15^{\circ} 2' 9''$ S., long. $39^{\circ} 8' 41''$ E. (approx.), the river at this point being 926 feet above sea-level.

29th.—Arrived at Shalawe, having passed the previous night at a stream within five miles distance. Was very cordially received by my old acquaintance Gavala, the chief.

June 30th—July 8th.—Laid up with sharp fever, the consequence of the muddy tramp and heavy rains experienced in crossing the coast belt. Unable to leave my tent for three days. This was most vexatious, as it prevented me fixing the longitude of Shalawe by an independent series of lunars. Was only able to obtain five, all of bodies east of moon, which gave mean long. $38^{\circ} 51' 4''$ E.; longitude by half chronometer watch being $38^{\circ} 50' 32''$ E., lat. $14^{\circ} 55' 48''$ S. Altitude of Shalawe by aneroid and boiling-point thermometer 1497 feet above sea-level.

Shalawe will, I believe, take a prominent place in the future development of this country. Not from any special fertility of its soil or richness of the adjacent country, for it seems to me to be rather ill-favoured than otherwise in these respects, and the eastern portion of the plain is poorly watered. But the peaceable and industrious habits of its people; its central position in the Makua country, and the number of trade routes diverging from it; its comparative proximity to the capital of the province, and the mild and just rule of its chief—affording perfect security to traders—all point to its taking an important position in the future.

The poverty of the soil about Shalawe is partly proved by the fact that its people go between six and eight miles to grow their rice. The precipitous sides of Shalawe and Pooso Hills form a partial dam to the drainage from the northward, and at their feet is a considerable tract of swampy ground. It is here that the Shalawe folk raise that luxury of African diet—rice. Little seems to be cultivated about Shalawe but cassava, Kaffir corn, and a pulse called *chiroko*. Tobacco bought by me for my men came from the Ligonya district. No indiarubber is collected here, traders seeking this product also further westward.

The chief trade routes that diverge from Shalawe are:—Northwards through Nabawa, at the foot of Mwima Hill, to the Lurio, and through Nbadua in the Bwibwi valley to the more northern portion of the same district at Muli-mwago, upon the river Nalawa, close to its confluence with the Luli. Westwards, to Mohemela on the Malema river, a district

much frequented by traders; also across the Inagu Hills to the Malema valley, or around the north or south extremities of these hills, viâ Namkuna and Msolomoa respectively,—these three routes all leading to the Upper Lomwe and Mihavani countries. South-westwards, through Namûrola, to the Lomwe country about the upper waters of the Ligonya and Likugu; and to the south, to the Makua country upon the Mluli, through Terala at the foot of the Mubwi Hills.

Although by far the greater part of the trade of this coast is carried on by Battias, Banians, and Hindoos, Shalawe is the only place in the interior of Makuani to which I could hear of one of these Indians venturing. The first, a Banian, went up about six years ago, but was so terribly robbed by his guide, an Arab half-caste, that he soon beat a retreat to the coast. Two others, Hindoos, left the coast almost with me in 1881, and I find that one of them has fairly fixed himself at Shalawe. But the experience of these two has not been encouraging to others. The second, more enterprising than the first, penetrated further westward, and was murdered last year at Najiwe. The result of my inquiries, however, leads me to think that his murder was due to the intrigues of some half-caste slave-dealers, who are strongly opposed to the entrance into Makuani of such successful traders as these Indians are. The companion to the murdered man would have fled to the coast, but was reassured by the powerful protection Gavala was able to give him.

9th.—Left Shalawe, and passing south of Pooso and Shalawe Hills, camped upon left bank of Mluli river. This river will be found marked, but unnamed, in the map that illustrates my former journey in this country. I was then told it was the Mluli river, which has its outlet at Angoche, 90 miles south of Mozambique. But seeing it so small a stream, about 10 or 12 yards broad in the dry season, I hesitated to name it, thinking it might only be an affluent of the main river. Close inquiry, however, upon this journey leads me to conclude that it is the main river very near its source.

To the eye, the Chiga range of hills appears to terminate at the point laid down by me in my first map. In reality they continue in the same direction—north-easterly, but at a much lower altitude. The ridge that forms this continuation divides at this point the Mluli and Mkubure river systems. It does not rise to a height of more than 2000 feet above sea-level. The two rivers were crossed at altitudes of 1531 feet and 1610 feet respectively, and four hours' walk brings you, over an easy incline, from one to the other. This does not destroy what I have before said with respect to the Mluli river, viz. that it is fed by the streams that drain the south-eastern slopes of the Chiga range.

10th.—The district of Nachere has been repopulated under a chief called Mtapata, and a new village is springing up, further to the west and upon one of the outlying shambas of the old. Traders are opening up a new route from Shalawe to the country about Mohemela on the

Malema river, and these people have selected this situation by reason of the profits they gain from the sale of food to passing caravans, and the stay of traders. Beyond being more direct, the new route has the advantage of avoiding the more populated districts passed over by me, where tribute must be paid to the chiefs Matuga, Mudia, Mazua, Namürola, and Nambewe. This question of tribute mainly affects the present traders in the Makua and Lomwe countries, as is natural, their stock-in-trade being generally small. From this point to Mohemela is said to be five to six days' march.

11th-12th.—Remained encamped upon the right bank of the Mkubure river. The river—which empties itself at Mwendazi in Mwemba Bay—at this point (in lat. $14^{\circ} 56' 48''$ S., long. $38^{\circ} 37' 1''$ E.) (mean of chronometer and lunars), is 30 to 40 yards broad and flows swiftly north-eastward over a shallow rocky bed at an altitude of 1610 feet above sea-level.

The Mkubure was left on the 13th, and, crossing the path leading to Mohemela, I rejoined my old route about 10 miles east of Mudia. In consequence of the trouble and extortion experienced by me before at the village of this chief, we made here a long detour to the southward, and passing through the village of Nakanyawa, a petty chief and dependant of Namürola, I arrived at the residence of the latter on the afternoon of the 15th.

15th-27th.—Native rule in this country, in some respects, is curiously like that of the most advanced of civilised states. It may be described as a number of confederations of petty chieftains. Powerful chiefs such as Gavala and Namürola draw around them a number of weaker chiefs; but these preserve the most perfect independence within their own districts, and with regard to their own internal affairs. It appears to be only in regard to external matters affecting the general weal, such as difficulties with neighbouring tribes, or war, that the smaller chiefs are subject to the decision of their leader. And representation is not wanting in the settlement of external matters; for no such important question as that of war would be settled without a great "milando" or "general council," in which every petty chief would personally take part or send his representative.

I have often had proof of the perfect independence of each Makua chief within his own district. It was again shown me here by the action of my guide. My friend Namürola is rather an extortionist, and traders do not love him in consequence. In order to escape his usual heavy demands my guide fixed his camp at the village of Nagulue, within one hour's walk of this. To that petty chief he paid a reasonable tribute, and although the district of Nagulue forms a part of the country named to the traveller as that subject to Namürola, no portion of the tribute was paid to, or was expected by him, the smaller chief pocketing the whole.

Another sharp attack of fever confined me to my tent for four days. But I purposely lengthened my stay here as this was the point furthest west reached by me in 1881, and I was anxious to fix its longitude and also to rate my watch. Observations for the latter gave me the same rate, to within four hundredths of a second per day, as that obtained before leaving the coast, so I hope the longitudes by watch obtained up to this point may be considered fairly reliable. The mean of thirteen lunars, seven of bodies east and six west, gives the longitude of Namūrola $38^{\circ} 0' 44''$ E.; the longitude by watch being $38^{\circ} 0' 44''$ E., lat. $15^{\circ} 9' 14''$ S.

27th-29th.—On the 28th I rejoined my guide at Nagulue and we left the next morning for Najiwe. Passing south of Mkorakora Hill, four hours' walking brought us to the deep bed of a river called Mkurabino, an affluent of the Mtiwa, which was crossed about 12 miles W.N.W. (by compass) of Nagulue. Both these were flowing southward, the first being an affluent of the latter. The Mtiwa connects with the Najiwe river, which, again, enters the Ligonya.

The general drainage of the country passed over between the line of hills laid down by me in 1881, immediately to the west of Namūrola (fresh bearings of which have been taken on this journey) and the Yabala ridge in the neighbourhood of Napūsa, is to the south and south-south-west. West of Yabala we again come upon the Luli or Lurio river system.

Much confusion arises from the Makua habit of calling a district, at times by the name of its chief, at times by the name of a river or some conspicuous hill in its vicinity. Najiwe was formerly named to me as Nameta, who was one of the two chiefs that governed it. It is now ruled over by a chief called Nambewe, the former having migrated last year northwards and taken up a position on the new route described by me from Nachere to Mohemela, and upon the Mtiwa river.

The Najiwe river drains a fertile and pleasant valley, the general direction of which is N.W. by W. and S.E. by E. It has its source in the Riani Hills, which bear W.N.W., and are distant about 15 miles. I noticed here that, in addition to the usual articles of food, tobacco was cultivated upon the river banks.

Although the valley is now thickly populated, it is not improbable that those who follow in my footsteps will find it deserted by its present occupants, as I was informed that a general emigration was contemplated to the Mtiwa district, already partly taken up by the people of the chief Nameta, with whom these people seem to have an old alliance.

August 6th-7th.—Left Najiwe on the morning of the 6th. Our path this day led us close round the Riani Hills, and at night we camped on the left bank of the stream Kurakulu, an affluent of the Mtakusa, which unites with the Ligonya. An hour's walk the next morning brought us to a second stream called the Sisiri, which also flows

south and enters the Mtakuss. Passing through a gorge leading between two hills, the Nakoli and Muhaha, north and south respectively, we crossed the Yabala ridge and descended into the bed of a small stream, the Nimereseen, an affluent of the Mutai, which connects with the Natalea, of the Luli river system. Thus the Yabala Hills divide at this point the Luli and Ligonya river systems, which drain to the northward and southward respectively. (Aneroid reading in crossing the Yabala ridge 27·3 inches.) At noon of the 7th we entered the village of Napūsa, in the valley of the Nisheshe river. The Inagu Hills bear from this point due west, distant between four and five miles.

8th–11th.—The small river Nisheshe, as it flows W.S.W. to enter the Mutai, drains here a pleasant, thickly populated valley, from one to three miles in breadth and six to eight in length. It is bounded on the north * by the hills Nyepe and Yabala and on the south † by the hills Mrugula, Tigili, and Mlema. The latter, lying at its eastern extremity, is a remarkable hill, and forms the most distinctive feature of this valley. The Mutai river, flowing south-westward, crosses the valley at its base, and after taking up the waters of the Nisheshe, unites with the Mtakuss, an affluent of the Natalea. This Mtakuss must not be confounded with the Mtakuss of the Ligonya.

The traveller in this country must be prepared to meet with a constant repetition of names. On this route I have passed the Nagulue of Mbadu, Nagulue Hill, and the Nagulue of Namūrola. We have also had the Shalawe of Gavala and Shalawe of Namūrola. The superabundance of names in this country is also perplexing. It is impossible to get a single name for a range of hills; but any Makua will readily tell you the name of each peak and each individual hill. The accurate knowledge the ordinary Makua has of the geography of his country is often astonishing, and I have rarely found it fail me. If I have been deceived in one or two instances, it has been by the coast trader and not by the Makua.

Whilst at Napūsa I received a visit from the Lomwe chief Namkuna, who occupies a position on the Natalea river, near to its junction with the Malema.

12th–13th.—Crossed the Inagu Hills and descended into the Malema valley.

The Inagu Hills form a double ridge, the inner slopes of which are drained by the Natalea river. These two ridges bound a very fine valley six to eight miles in breadth, and the central dip of which, at the point crossed by me, is 1150 feet. Down this valley the river rushes, forming in its course a series of very fine cascades, until it finds its outlet at the N.N.E. extremity, whence, preserving the same direction, it flows on till it joins the Malema river. Lying E.S.E. and

* East and south, according to the author's map.—[Ed.]

† North on the map.—[Ed.]

W.N.W. (by compass) and at the southern end of the valley is the ridge which divides the Natalea and the affluents of the Ligonya at this point. The night of the 12th was passed on the banks of the first river, at an elevation of 3633 feet above sea-level.

Ascending the western ridge the next morning I obtained a very fine view of the adjacent country from an elevation of 4763 feet, and was able to gain a fair notion of its outlines and conspicuous features.

From east to west the eye travelled over a tract of country not less than 60 miles in width, losing its view to the eastward and northward amongst hills of every shape and form, the most marked of which were the Mripa, the Riani, and the Mlema. Looking westward, an almost bird's-eye view was obtained of the Malema valley, from 12 to 15 miles in width and apparently a dead level, though after descent into the plain some detached hills become visible. Across the level belt, bounded eastward and westward by the Inagu and Namuli Hills respectively, the Malema river takes an almost diagonal course, and its outlet from the Namuli Hills, where it has its source, may be distinctly seen near their south-eastern extremity. Flowing north-eastward it winds close round the Inagu Hills at their northern termination.

But the most remarkable feature westward was unmistakably Namuli Peak and its surrounding hills. Although not reaching the description that traders in this country generally give of them, they form a very fine block of hills, the highest point of which I estimate at 8500 or 9000 feet. Okikitika, the highest point of the Inagu Hills, was about 1200 feet above the elevation reached by me on the western ridge, and would be therefore about 6000 feet above sea-level.

Our descent occupied us about three hours, and, though in parts difficult for the carriers, was very interesting. The western face of Inagu is more broken than the eastern, and amongst the valleys and deep ravines formed upon it by the streams that rush down here to feed the Malema river, the eye is gratified by some very beautiful mountain scenery. On the night of the 13th we camped at Namlugu on the right bank of the Malema river.

This river is the largest crossed by me since leaving the coast; although it cannot be less than 300 miles from the outlet of the Luli river in Lurio Bay. It is between 40 and 50 yards in width; but unlike the broader and shallower streams of Ngambo and Mkulure, which flow over broken rocky beds, the Malema has its course between stiff clayey banks. In this the dry season it was fordable at Namlugu; but during and after the rains it is crossed by two suspension bridges, three miles apart, at the villages of Namlugu and Baridi. These bridges are between 20 and 25 feet above the present level of the stream, and are very ingeniously constructed with long supple sticks crossed by short stouter ones, the whole bound together with fibre cord and suspended from the branches of tall trees upon the banks. I crossed

one with a party of six men, and we tested its strength by crossing it together. It may have borne more than double that number. Such care had been taken to rail in these bridges that a child might have crossed alone without fear of falling into the water.

The streams that drain the western slopes of the Inagu and feed the Malema river are:—1. Revere; 2. Nakoli; 3. Mōlini; 4. Niobe; 5. Ukuruguru; named from north to south, the first four being north of Namlugu and the last south. Three of these were crossed by me, and the Molini is said to be the largest of all.

The Ukuruguru takes its source in the Mkasi Hills, which are a continuation of the Magu to the south-westward, but at a much lower altitude. They form at that point the water-parting of the affluents of the Malema and Ligonya. The village of Msolomoa is situated at the feet of the Mkasi Hills.

16th–19th.—*Egwoli*.—These three days were passed at the village of Egwoli, which, with that of Anabuna, is situated upon the south-eastern, eastern, and northern slopes of the hill Koje, which rises to an altitude of 1000 feet above the plain. The northern extremity of Inagu bears from this N. 57° E. (compass), and is distant only four to five miles.

Forty-two lunars taken at the eastern and western feet of the Inagu Hills and on the Malema river, will, I hope, help to fix the position of these two important points.

These people are, certainly, of the primitive the most primitive, and it would be difficult to conceive any more absolute go-nakeds than they. My guide purchased for me, for *one hand-palm's breadth* of the commonest calico, a mat of native make that must have cost many days' labour. That palm's breadth—40 inches in length—would certainly provide complete suits of clothing for at least half-a-dozen adult members of the family, no matter of which sex. I am glad, however, to be able to say that I saw here, for the first time since leaving the coast, some cloth, strong and well woven, of local manufacture. But it was very rare, as cotton is little grown. Westward this art of hand-weaving is more practised.

Upon the plain and on the banks of the Nakoli river, which runs off the north-west face of Inagu, I noticed the growth of sugar. It is, however, only cultivated in small quantities.

20th–21st.—Started from Egwoli to cross the Malema plain. Our path wound to the north-west and west around the feet of the hills Koje and Muguru. The huts of the village of Egwoli are thickly scattered along the line of route north of these hills, and line both banks of the small river Namaga which flows eastward into the Malema. Passed close on our right, and to the north of Koje, a well-marked cone-shaped hill Kulutu, upon the northern side of which is the village of Shasha.

A sharp but short descent is made from Muguru into the plain, and hence our path led us over almost a dead level, which in the rainy

season must form rather a bad swamp, judging from the spongy tracts in many parts passed over. Six hours' march from Egwoli, and we arrived on the banks of the Ludia river, which has its source in the Namuli Hills, and flowing northwards connects with the Nalume, another main tributary of the Luli.

If my observations be correct, the Malema plain (I call the level belt between the Inagu and Namuli Hills, for simplicity, the "Malema plain") sinks to the westward and on the banks of the Ludia more than 400 feet. On the night of the 20th we camped on the banks of this river.

An hour's walk the next morning brought us to the Losi river, flowing N.N.E., an affluent of the Ludia, and shortly after we entered a cultivated district, the work of the people of Mwedederi, one of the most powerful of Lomwe chiefs, whose village is fixed at the north-eastern extremity of the Namuli Hills, at an elevation of 3500 feet, and between the valleys of the Ludia and Nalume. Camped at the southern foot of Nikomani Hill.

Aug. 22nd-Sept. 7th. — Mwedederi. — At this point my guide commenced his trading operations, himself going on to Nihoma, one day's journey further west, and detaching his headmen into the surrounding districts. My stay here was therefore a long one, as I am compelled to conform to his movements. He has, however, promised me to send his party to the coast when his business is done, and to accompany me alone on my journey. This, he says, he will be able to do in fifteen or twenty days' time.

I have now walked over this country in every direction, and the more I see of it the better I am pleased with it. It is full of points of natural beauty, and I am convinced it will be found to be healthy and well adapted for the residence of Europeans. Shady and fertile valleys watered by the purest mountain streams, and like the valley of the Ludia, situated at an altitude of between 3000 and 5000 feet above sea-level, cannot be unhealthy, or fail to prove attractive to those who are devoting their lives to the civilisation of the natives of Eastern Africa, and who only seek suitable localities where they can preserve health to carry on their good work. No better position could be found than the Namuli Hills, for the establishment of a central mission and sanitarium, from whence branch stations could radiate into the surrounding country, and I hope very many years may not be allowed to pass before some earnest workers—whether they be English or Portuguese I think matters little—be found to occupy this spot.

It seems to me that even for the purpose of developing legitimate commerce, trading stations might be advantageously fixed at such a position as this, on the Nalume valley at Nihoma or Etutuli, or other points that a more careful examination may show to be suitable.

The greatest obstacle I fear, and one that must be seriously considered before any attempt to establish such stations be made, is the

certain and powerful opposition of those who hold the present monopoly, viz. the half-castes and other traders from the coast. They would at once see in such a proceeding an attempt to wrest from them their trade, and by working upon the superstitions of these people and deceiving their chiefs as to the true objects of the whites, might place the latter in a very precarious position. It will be absolutely necessary first by some means to establish confidence and to win over a few of the most powerful chiefs, who must be made to see that it is in their material interests that the slave trade should cease and legitimate trade be developed. Such a development will be slow and uncertain; but when it comes it will be a bright day for this country, which is at present, and has been for the past two centuries, completely at the mercy of the slave-dealers.

Anxious to get a bearing of Namuli Peak, I left camp at 4 A.M. on the 1st of September to cross the Losi valley and make the ascent of the Mwakwa Hills. This climb was a most pleasant one. The natural beauty of the surrounding scenery was enhanced by the golden light which the rising sun threw upon the hill-tops, and the fresh, almost cold, breeze made the exertion very enjoyable. From an elevation of 5423 feet, and near to the base of Mwakwa Peak, I looked across the Ludia valley and gained a very fine view of the hills lying between it and Namuli and to the eastward of the latter.

The Ludia and Losi valleys are almost parallel to one another, both winding round from their south to north course in the plain, to nearly east and west. The Baroni, judging from the ridges of its bounding hills Kwiani and Mregeli to the north and Mraja and Elugu to the south, has its outlet to the plain in an E.S.E. direction; whilst the Malema flows out to the south-east, afterwards changing its course to the east and north-east.

Mwakwa Peak, bearing from my point of observation N. 66° E. (compass), distant half to three-quarters of a mile, rises up, in shape a sharp cone, between 1200 and 1500 feet above me. This peak may at once be recognised from its bearing upon its summit three sharp cylindrical boulders, up-ended, the diameter of the one smaller at the base than at the top. Its elevation will be about 6600 to 6900 feet.

Namuli is a double peak, the higher showing, upon this bearing, a square flat top. It cannot, I think, be less than 2000 feet above Mwakwa.

These Namuli Hills must surely, at the time of their upheaval, have formed a huge quadrilateral block. Out of the heart and faces of this the denudation of ages has worn out, to the north-east, east, and south-east, the valleys of the Losi, Ludia, Baroni, and Malema rivers; upon the southern face the valley of the Likugu; from the south-western the Yano, a main tributary of the Likugu, has its source, and from the north-western the Nalume finds an outlet. To the action that has

carved out these valleys and formed the adjoining plains, the granitic and hard metamorphic rocks have remained invulnerable, and now form the peaks and ridges that cut up and so beautify this range.

There is a very interesting and curious tradition amongst the Upper Lomwe with respect to Namuli Mountain. It is said by them that Namuli gave birth to the first of the human race, and that the first man and woman came "out of" that mountain. Asking if the first beast, bird, and fish, also descended from it, they replied "No, only the father and mother of us all; but," they said, pointing to the N.N.W., "there is a hill there six days' journey from this, from which all other living things came."

The feeling of veneration for the most conspicuous or remarkably shaped hill in their vicinity—in the case of Namuli almost reaching a mountain-worship—appears to extend throughout the Upper Lomwe.

When at Napūsa I heard of the sacred pigeons of Okikitika, birds that were never killed and often had food carried to them, for they rested and built their nests upon a peak that was held in veneration by those who dwelt in its neighbourhood. Great "milandos" or general councils, are usually held at the feet of these mountains.

Even amongst the Lomwe further eastward this feeling, though much weaker than amongst the inhabitants of the highlands, to a certain degree exists, and I found that both at Mātuga and Shalawe the people looked upon certain hills with peculiar regard.

This regard may perhaps be accounted for by, and may possibly have originated in, the fact that these hills form hills of refuge from their enemies. Throughout Makuani I found that the past raids of the dreaded Mangoni formed one of the chief landmarks of their simple history. Of two of these, in one of which the country was devastated as far east as Shalawe, there remain the clearest traditions. And upon this raid, Shalawe Hill, Okikitika, Nikomani, and Namuli, formed the hills of refuge for the people of Gavala, Napūsa, Mwedederi, and those who dwelt at the foot of Namuli, respectively.

The rivers to which these hills give birth—the Luli and Likugu, by far the largest between the Rovuma and Zambezi, show how important and central a position they occupy in the fluvial system of this country.

The mean of eighteen lunars taken at Mwedederi may, I hope, fairly fix the longitude of the eastern limit of the Namuli Hills.

Great excitement was caused throughout the village one morning, at early dawn, by the cry that a man had been taken by a leopard. Joining in the general rush, I arrived in a few minutes close to the house of the chief, where a fine large leopard lay dead upon the spot where it had been shot. It appears that in the night the brute had entered a hut and carried off a dog. Frightened by the noise made by the inmates of the hut, he had dropped his prey and fled. Feeling sure he would return for it, two or three men tied the wounded dog to a tree and lay in wait

near the spot. Just before dawn he had returned, and was shot in the act of seizing the bait. One of the men approached him too soon, and the brute severely mangled his arm.

7th-8th.—Since leaving the coast our course had been wonderfully direct to the westward, and we had never diverged from the latitude of our starting-point Ngambo more than six or seven miles. But on leaving Mwedederi we turned almost due south. Our path first led westward up the Losi valley and across the Yabala ridge that encloses it to the eastward, then down the bed of the Mayali stream and into the plain of the Nalume river. We now turned to the S.S.W., and for five hours marched in a course parallel to the Nalume river, crossing it in lat. and long. (by account) $15^{\circ} 15' S.$ and $36^{\circ} 38' E.$ The river was here between 20 and 30 yards broad, shallow and running over a stony bed, at an elevation of 2496 feet above sea-level.

Six feeders of the Nalume were crossed on our march up the valley and before we came to the main stream. Named from north to south these were:—1. Mayali; 2. Kulubi; 3. Murura; 4. Napigu; 5. Nampweni; 6. Pisin, all flowing off the north-western slopes of the Namuli Hills. During this day's march we kept fairly parallel to the north-western face of the Namuli Hills, sighting some fine peaks amongst them, the most conspicuous of which were those of Palawa, the higher of which cannot be less than 7000 feet.

Crossing the Nalume we struck off to the south-west and up a fine valley enclosed to the north-west by the hill of Echibwi. The south-western extremity of this connects with, perhaps more correctly may be said to form a part of, the Namuli Hills, and the connecting ridge forms here the water-parting of the Echibwi and Yano rivers, affluents of the Nalume and Likugu respectively.

Crossing this ridge we descended into the valley of the Yano, camping at noon of the 8th upon the opposite side of the valley, and on the right bank of the Wāлага, a small stream connecting with this river.

The increase of population west of the Malema valley is very noticeable. On the last two days' march, and between Mwedederi and my present encampment, I passed no less than seven villages, of which those of Nahepeliwa, Nihoma, Etutuli, and Nadodo were the chief. This is a favourite field for traders from the coast, and at all the villages I have named were half-caste Arabs and others from the neighbourhood of Mozambique.

9th-16th.—Feeling this to be an important point, not only because I am near the water-parting of two of the chief rivers of this coast, but also because it fixes the south-west limit of the Namuli Hills, I delayed here five days and got twenty lunars on the 10th and 12th. Latitude observations delayed me till the 16th, as the other nights were unfavourable.

19th-24th.—*Nanqoma.*—Leaving the Yano valley, we ascended the

Mapé Hills that bound it to the westward, and in crossing them reached an elevation of 3400 feet (approx. by aneroid barometer). In crossing these hills, we skirted some fine valleys and deep gorges, our path leading high up on the hill-sides and over the intervening ridges. Three hours' walk from our camp at Yano brought us to a narrow valley, lying N.W. and S.E., bounded on the north by a fine hill called Lugwi, which rose up to a height of 1500 feet or 2000 feet above the plain. This soon widened out to a broad valley, or rather plain, of eight or ten miles in width, watered by the river Lukotokwa ("that flows through red soil": "Ekotokwa" meaning "red soil"), which has here a south-westerly course, and connects with the river Likugu. Upon the south side of this valley, and at the foot of the hill Mazizi, is the village of chief Namūrola, from whom I received a friendly visit during my stay.

This is the district in which my guide has chosen to conduct all his trading operations, and I see that I am now being trotted round and lionised in furtherance of them. However, I cannot grumble much, for he leaves all here in charge of his headmen and accompanies me alone on the remainder of my journey.

After five days' delay I got him away, and we continued our journey, our path leading us again to the northward to take up the direct westerly route, from which I had deviated considerably in going to Nangoma to rejoin my guide. In this day's march we passed over a low ridge, between the hills Mahara and Lugwi, out of the valley of the Lukotokwa into that of the Lusi. Crossing first the Ohukulu, which unites with the Lusi, we arrived at noon at the village of Turua, situated on the left bank of the river. The Lusi flows here north-easterly over a bed curiously formed entirely of massive water-worn boulders.

Bounding this valley to the westward are the hills of Matakawe and Mrieku, which lie north and south by compass. At 3 P.M. we rounded the southern extremity of the former, and shortly after camped at the village of a chief called Makanyera, on the Mtusi river, which flows north-westward and connects with the Luli.

25th-30th.—I have now arrived at the extreme western limits of a most interesting country, the home of a most interesting people, that of the Highland Lomwe. Instead of the "fierce, treacherous, and inhospitable" people they are generally painted, and whom I fully expected to meet, I find a tribe industrious and peacefully disposed—though unhappily not always at peace owing to the efforts of slave-traders—workers in cotton and in iron, and superior in most respects to any other section of the Makua people I have yet encountered. Specimens of their skill in weaving cloths and working iron I am collecting, to be sent home at the termination of my journey.

I speak of the Lomwe as a section of the Makua race, and by the few who have heard of their existence—I think Elton was the first to mention the name—they have always been spoken of as such. I have

myself done so. But I am beginning to doubt if they can rightly be called so. Their language is curiously different, and though it contains very many Makua words and others evidently of Makua origin, it has some very distinctive features of its own. This is only natural, for upon the eastern, northern, and southern outskirts of their country they have gradually amalgamated with the Makuas, until at some points, such as Shalawe, it is difficult to say if they are more distinctively Makua or Lomwe.

On the west they have mixed in like manner with the Maravi. Since crossing the Mapé Hills west of the Yano valley, I have been in a district called Mihavani. These people speak a language that is known amongst traders as Ki-Mihavani, and is, I am told, half Lomwe, half Maravi. The chiefs Namūrola, Nangoma, and Makanyera have all told me they belong to the Maravi race, and that their own country is that about the shores of Lake Kilwa. From that country they say they were driven by an invasion of the Mangoni "a long time ago." It is almost impossible to get a definite expression of time from a native. Flying eastwards, they came to the hilly country about the Namuli Hills. Some finding these districts securer and more productive than that they had left, settled upon them, and have become part and parcel of the Lomwe tribe. Others, after the Mangoni had passed away, returned to their own country about Lake Kilwa. This is the account given me by the Maravi themselves in the Lomwe country. Mwededeni, as well as those I have named as living in Mihavani, is a Maravi chief.

Perhaps I could give no better proof of the real courtesy and welcome given me by these Lomwe people, than that Mwededeni, one of their most influential chiefs, personally accompanied me to the shores of Lake Kilwa, to introduce me to his connections there, and smooth away any difficulties that might arise from a misconception of the real objects of my journey.

Sept. 30th—Oct. 2nd.—Both upon this journey and in that made by me west of Mozambique in 1881, I have crossed numerous affluents of the Luli or Lurio river. Since passing out of the valley of the Mkubure all the drainage to the northward has been into that river, and I think it may be said to be, without doubt, the most important river of the coast between the Rovuma and the Zambezi.

Three hours' walk in a W.N.W. direction from Makanyera now brought me upon the banks of the main stream of that river. It is said to have its source in the Mrubu Hills. These hills lie 12 or 15 miles south-west of the point at which the river was crossed by me, a point that by dead reckoning I place in lat. 15° 15' S., and long. 36° 9' E.

The general aspect of the country greatly changes as one travels westward from Mihavani. The plains grow wider; the hills are more detached and diminish in size and altitude, and the country altogether assumes a tamer look. You feel you have left the border hills behind you and have commenced your descent into the basin of the Central

African lakes. On the night of the 30th, after a hard day's going, we camped on the banks of the Luasi, the last affluent crossed of the Luli river, and at the eastern foot of a low range of hills, lying north-east and south-west, that separates here the Luli drainage system from that of Lake Kilwa.

Crossing these hills on the 1st of October and passing several hamlets of the Maravi tribe pleasantly situated amongst them, we arrived in the afternoon at the village of Chigwadu, on the banks of the river Mnoto, which flows into Lake Kilwa.

Four hours' easy walking on the 2nd over a dead level country, brought us to the village of Mkanyea within a mile of the eastern shore of Lake Kilwa. From this point the waters of the lake and the two islands Kisi and Kitongwe, as well as the hills on the opposite shore—Zomba, Chikala, and Chunguni—and those to the southward of Milanje, are all clearly visible.

Oct. 3rd.—I am now pushing to despatch a mail home via Blantyre and Quillimane, containing an account of my journey from Mozambique to this lake, and I must therefore defer all remarks upon this district until the concluding portion of my narrative.

The first half of my journey is accomplished, and I think I may now say I have succeeded in opening up a new route from the East African coast to the Central Lakes district.

In point of geographical interest, of security, and facility of travel, I believe this route will compare favourably with any overland route to the African lakes. When we look at the difficulties of the Zanzibar-Tanganyika route; the dreaded Makata swamp; the insecurity caused by the presence of such lawless chiefs as Mirambo; the extortionate *ushongo* or blackmail levied on that line by chiefs accustomed to the passing of rich unwieldy caravans, and the obstructive character of the Arabs and others who live in the interior districts and acknowledge the rule of the Sultan of Zanzibar only in name, as well as the uninteresting character of the country passed over, I feel that the two routes cannot be placed side by side.

The survivors of the unfortunate expedition of my predecessor Captain Elton, and the able leader of the Geographical Society's late expedition, Mr. Thomson, have shown us the difficulties of the route from North Nyassa to the Zanzibar coast. And to these must now be added the dangers inseparable from the proximity of that freebooting, murderous tribe the Magwangwara.

The old Kilwa-Nyassa road, opened up first by Dr. Livingstone, passes now in great part through a deserted and desolate country, owing to the ravages of that same tribe, who only last year destroyed the Universities Mission station at Masasi, which was situated almost upon it.

Traders from Kilwa, Lindy, and the adjacent districts now, I am told, ford the Rovuma at a point much lower down than formerly, and take up

the Tunghi-Nyassa road, upon which I journeyed as far as Lake Lidedi last year. They do not cross the Lujenda, but keep upon its right bank, travelling parallel to and up the valley of the river, until a point near Mtarika's is reached.

There remains one more route to the Nyassa, of which as yet we know nothing, and which it was my ambition to open up upon this journey, viz. that which passes through the Maua and Medo country and terminates on the coast at Kissanga near Ibo. I deeply regret that the prospect of my being able to do this is diminishing, as the termination of the period of my leave of absence is approaching and the rains are nearly upon us. I shall, however, strive to avoid returning by the same route as that by which I came.

EASTERN SHORE OF LAKE KILWA OR SHIRWA,
MKANYEA VILLAGE,
October 4th, 1883.

*Brief collection of Lomwe words made in passing through the Lomwe country,
July to October 1883.*

The following vocabulary is sent as it has been collected. No attempt has been made to classify the words or to examine their construction, for which indeed I have had no leisure. I beg that it be remembered the collection has been made by one travelling through a country and not residing in it. It was not intended to be sent home until the termination of my journey, by which time I hope to have it greatly enlarged and put into better shape. But a desire to give others more competent than myself an opportunity of assigning the right place to this Lomwe people has decided me to send at once the first-fruits of my collection.

Many errors have doubtless crept in, and at times a Makua word may have found a place amongst the Lomwe. I have, however, taken the utmost pains to avoid this by careful reference to the vocabularies of Ki-Makua in my possession. These are two in number—that of Dr. Peters and the more recent one of the Rev. Chauncy Maples.

The incompleteness of these collections and the great difference in the Makua spoken in the different parts of the vast area over which the tribe is spread, as well as the gradual amalgamation that has taken place in many parts of the country between the Lomwe and Makua, make a rigorous division between the two languages at times very difficult.

In Mr. Maples' handbook of the Makua language we have the most valuable collection of Makua words hitherto published; but it has been gathered upon the very outskirts of the Makua country, north of the Rovuma river, and I am constantly coming across words of the same signification, that can hardly be synonyms, which differ completely from those given in his collection.

Dr. Peters has given us the Ki-Makua of Mozambique and its neighbourhood, in which a horribly corrupt Portuguese has largely entered. Then there are other dialects of the Makua language, some of which are said to differ strongly from each other, of which no collections have yet been made; such as the Maua and Medo; the "Ki-Wibo" which appears to be more than half Swahili, and the "Ki-Angoche" which seems to be mixed up with Sakalava, Comoro, and the languages of others, with whom it was a favourite contraband station before its occupation by the Portuguese some twenty-five years ago.

Judging partly from a careful comparison of this Lomwe vocabulary with those that have been published of the Makua language, partly from the fact that a separate and distinct place seems to be given them by the adjoining Makua and Maravi tribes, and partly also from what I have seen and heard of them in travelling through this country, I am inclined to think we may have erred in speaking of the Lomwe people as a branch of the Makua tribe. It seems to me not impossible that future and more thorough research will assign to them as distinct a position amongst East African tribes as that occupied by the Yao, Anganja, and others.

Partly incorporated with the Makua they doubtless are upon the northern, eastern, and southern outskirts of their country, as in like manner upon the western, in the district of Mihavani, they are with the Maravi. This gradual process of amalgamation has gone on so long that in certain outlying districts such as Shalawe, it is difficult now to say whether they are more distinctly Makua or Lomwe.

But whatever the place assigned to the Lomwe tribe, it seems to me an acquisition of the means of gaining a knowledge of their language is of the first importance. It is unquestionable that they occupy the finest districts of the country hitherto marked on our maps as the "Makua country." To the northward the rich and fertile valleys of the Bwibwi, the Malema, and Nalume rivers, and the district about the upper waters of the Luli river itself is peopled by them; whilst the healthy and picturesque country around the Namuli Hills may be called their central home.

To the southward, I am told—and this only confirms what was written by my predecessor in his narrative of a sea journey made by him to the mouths of the Quizungu and Moma rivers—the country occupied by them is separated from the sea-shore by only a narrow belt of Makua. The valleys of the Yano and Lukotokwa, as well as much of the country drained by the numerous affluents of the Mluli, Ligonya and Likugu, are certainly peopled by, and only by, the Lomwe.

To whomsoever business or pleasure shall call to this country in the future, whether he be trader, missionary, or hunter, an acquirement of this language will be a great gain. To the first two, I think, almost indispensable, in order that they may free themselves from the shackles of the not too trustworthy class of interpreters who now form our only medium of communication with this people.

With these feelings uppermost in my mind, I am striving to make such a collection of Lomwe words as shall at least serve as a basis for others more able, and who have more leisure than I, to enter upon a study of this language. The following few words will, I hope, prove to be only the nucleus of a larger and more valuable collection.

	English.	KI-Lomwe.	KI-Makua.
A tree	Miri	Mitali	
A star	Eteneri	Etotoa	
A cloud	Mahurugu	Megu	
The evening	Woshegua	Wohila	
To bind, shut	Owala?	Utuga	
To unbind, open	Ohula?	Utugula	
A forest	Muhiru	Etakwa	
A pipe of tobacco	Ekoli	Enugwa	
A net for catching game	Mulaba	Etavi	
The cloth of tree bark	Nimojo	Nimodo	
A hoe	Mshesheri	Ehipa	
An axe of native manufacture	Kashemo	Epaaso	
A wizard	Ukwiri	Oloa	
A sweet potato	Bihiri	Karaga	
Honey	Inui	Uravo	
A grave	Mahiye	Mazihara	

English.	Ki-Lomwe.	Ki-Makua.
A cat	Malua	Kwatu
A bird	Balame	Mwanuni
Oil of amendoim	Musara	Namuhagwa
An earring	E'ora	Amkurinya
An anklet	Esabu	Enyadu
The dress of women	Opotela	Mgonda
The flat stones used for grinding corn	Namahau	Nchilo
A dandy, coxcomb	Eruso	Orada
A species of rattle worn on the ankle } during the dance }	Makoaheru	Mahea
A preparation of leaves mixed with } food to serve as a relish }	Esasa	Mataba
A very small grain eaten in the form } of porridge, and used to make an } intoxicating liquor much appreciated, } and stronger and sweeter than the } "pombe" of mtama or cassava .. }	Kwakwe	Marubi
The hair of the head	Mihi	Ekarari
The hide of an animal after it has been } prepared and dried }	Eshabala	Ekataka
A waterfall	Eparawe	Nikuli
A rat	Machili	Emede
A spear	Mkuluba	Nivaka
A sleeping mat	Muli	Mtato
An earthen vessel	Ikali	Mwabu
A flat earthenware plate	Mujeju	Mukogu
A small vessel used for putting their } food relish in }	Eworo	Mukakasi
The banana tree	Miwobo	Miniga
Tobacco, after it has been dried	Hora	Sona
Gunpowder	Kasheka	Oka
A gun	{ Nikua } { Mtapiko } { Mbila }	Kapuli
A buffalo	Pulubu	Enari
An elephant	Nakumali	Etebo
A hyena	Majapua	Kuzupa
A small rhinoceros	Shepembere	Mchojo
A crocodile	Mukaku	Ekonya
A mosquito	Echichima	Ebwillimiti
The common house fly	Ekulihi	Epebele
A dog	Samla	Mwalabwa
A guinea-fowl	Ekololo	Ekaga
A very broad-bladed spear	Kavi	Nivaka-nulubale
A barb-headed spear	Chokerere	Choka
A spear made completely of a very hard } wood }	Musonga	Mkobe
A newly made path, untraversed by } many people }	Nikarara	Mpito
A well-known and commonly traversed } path }	Nikata	Nikwala
A rabbit	Namarogolo	Ugula
A fish	Itobi	Ehoba
War	Namura	Ekoto
A thief	Nikogoni	Wiya
To cheat	Oturula	Umwaka
To hoe	Okwasa	Ulima

English.	Ki-Lomwe.	Ki-Makua.
To speak	Ologoha	Uhimia
To hear	Owiriana	Wiwa
A mad person	Amsiri	Aneba
Wooden trough used for thrashing corn	Erawe	Iriawe
The chaff of corn	Etogwa	Etelo
A needle	Eesokore	Mtoto
To borrow	Opolea	Wolia
To accompany	Ochana	Utara
To tattoo marks upon the body	Ehuku	Upopa
The ear	Muwiwi	Maru
The eyebrow	Iapi	Makwigwi
The beard	Ebwetu	Ereru
Sand	Echaya	Mtaga
The finger	Miné	Makoko
A falsehood	Wota	Oreramwano
A large kind of pea	Echà	Mpagura
The cheek	Marama	Malaga
The nail of the finger or toe	Makaru	Ekata
A stranger	Mlejo	Mledo
Cold	Nakudu	Oriria
A small iron instrument used for tattooing	Namalopa	Ehoka
A razor of native manufacture	Nchemu	Nimedo
The shoulder	Nikata	Eturi
The neck	Nalokoloko	Milo
To be ashamed	Ohawa	{ Uhuva Uliamuru
The body	Mwili	Erutu
A bag	Lihosha	{ Mfuko (S.) Sacco (P.)
A fish-hook	Nimiso	Nanjolo
Bait for fish	Nyakwara	Ejambo
Iadiarubber	Korá	Mpira (S.)
A hat	Epirima	Mlema
A bedstead made of clay	Mushiro	Kitanda (S.)
A bow	Orà	Mura
Bitter	Onena	Owawa
A person blind of one eye	Oregana	Opweanito
A swelling or tumour	Eloja	Nipote
A bone	Nigokojoko	Nikuva
A boundary	Mikagano	Mwinano
Brother	Munamuno	Muhimaga
The Deity	Murimu	Mlugu
Thunder	Etari	Etari
Lightning	Overima	Oserima
Custom	Mukori	{ Ekwieri Mwiko
Chalk	Ekobi	Etakao
The dress of a man	Namakata	Malaya
Small-pox	Echopa	Etuvi
Salt	Maba	Naka
A fowl	Èku	Mwalaku
A squirrel	Ejaga	Ekoba
Smoke	Etutu	Mwishi
To be unwell	Wisheliwa	Uwerei

English.	Ki-Lomwe.	Ki-Makua.
A salt pan	Nulu	Epwita
A ravine or large hole in the earth ..	Ekogwi	Nlidi
The state of pregnancy	Ahikalela	Arubana
A bullet	Ehoruma	Epolovolo
A small measure for gunpowder ..	Etapateru	Ekariga
A belt worn to carry these small measures, each containing a large charge	Kadoru	Nambwobar
A ramrod	Moshaviro	Ekapete
A cowrie. This shell is much prized as an ornament by the Lomwe ..	Ebarasuku	Ekori
The period of mourning that succeeds the death of a relative or friend ..	Milala	Namkweli
A cap or head-dress	Eahuli	Kofia (S.)
Blue calico	Karebareba	Ekua yoriba
White calico	Eahema	Ekua odela
A very small grain	Nashasha	Mahele
A water-rat	Napochogwe	Napolo
The woven cloth of the country ..	Kapacha	Nehira
A long, narrow cloth made in the country and worn by the men ..	Mukwagwali	Muzago
Sister	Abosie	Mrogoraga
Uncle	Namatata	Musulaga
Oil	Malesu	Makura
An evil spirit	Asaraji	Amashepa
A black ant	Nyipini	Mzozo
A white ant	Uweshi	Overa
A small sheath made of wood for a knife	Epenya	Nduo
A comb	Ehashulu	Epenti (P.)
A stone	{ Niboochwa Mtagaliwe }	Mluga
The short rods around which the hair is bound with fibre cord	Musheka	Musheka
To pierce the ear or upper or lower lip for the reception of the discs of wood or shell or iron rod they place there	Ochemala	Otemula
Blood	Mulova	Ipome
A goat	Echehu	Eburi
A dove	Ekunja	Pomba (S.)
A native basket	Mulala	Mkuta
A gourd used as a drinking vessel ..	Echupa (?)	Namarika
Red pepper	Sabora	Poiipiri
A quarrelsome person	Msugulu	Mwanamwano
Spittle	Mara	Eshenya
To cut into shape or form, to adze ..	Osagula	Otogola
A bean, haricot bean	Nehabela	Ekute
Rice	Tili	Muga
To-morrow	Osheshelu	Melo
The day after to-morrow	Ohugule	Mroto
A hermit, or one who lives much alone	Ohaboliwa	Winia
Strength	Maahiva	Iguru
The first rains which set in in October amongst the hills	Otula	Ochula
A pulse, much consumed as food in all the Makua and Lomwe country ..	{ Namurovo Namkolovio }	{ Holoko Chiriko (S.) }

English.	Ki-Lomwe.	Ki-Makua.
An eagle	Kalagachi	Namagwevi
A stick of sugar-cane	Murekeli	Muhali
A crow	Mureko	Nakugu
An iron bracelet of native make	Nakoje	Nibwe
A small iron rod inserted in the lower lip by the women	Kolovi	Mtala
A small black bead much used in ornamentation	Nikokopihi	Nyhiri
The temporary huts used by passing strangers	Mikocha	Marabata
A stockade or enclosure	Vamakumanelo	Eriga
A door	Olago	Makora
To err	Obahula	Ovonya
The face	Ekove	Wito
Small faggots	Etakwarikwa	Etatu
Hunger, famine	Namuekwe	Etala
A fire-place of three stones	Machua	Matua
A fire-fly	Ekayakaya	Epanipani
The flat	Ekutu	Ekwipi
A flea	Etotomu	Ovavani
A flower	Echuva	Eduva
A forked stick	Nikoroma	Epata
Fruit	Sawima	Wima (?)
Dizziness	Nagalikali	Naruru
A girdle or belt	Etikwi	Ekulula
To rejoice	Omira	Otela
A glutton	Omira (?)	Mulala
A grandchild	Apwia	Musulaga
A smithy or hut in which iron is worked	Chukucha	Chukucha
The bellows used in the furnace	Murupa	Murupa
The clay retort used at extremity of bellows	Enyopi	Enyopi
The hammer used	Ekopo	Enuto
The anvil	Mushumu	Nlugu
The rods used to seize the hot iron	Kelegeha	Etanazi
The particles of iron that fly off when the iron is struck	Masaka	Masaka
The morning	Oshishelo	Obihiyu
The day	Nehigu	Elelu
Deep waters	Oririmela	Vowisha
On purpose, with forethought	Epoosa	Mwayiui
A desert	Etoro	Otako
Dew	Okami	Okami
Dirt	Ekokola	Ekokola
A dissipated person	Orarus	Wamana
Drum used to call the people of a village to war	Namshoro	Ekomango
A dwarf	Anivisi	Okuveha
An egg	Nihalashusho	Noje
The yolk of an egg	Noshera	Noshera
The white of an egg	Notela	Marubo
A stool of native make, carved out of one piece	Nipiragwe	Ehije
An oil tree	Mkura (?)	Epopo
A cause, reason	Matoa	Miogo
A cave	Etilo	Nikugu

English.	Ki-Lomwe.	Ki-Makua.
Charcoal	Mashuhu	Nikala
A cock's crest	Enyenjera	Ejonjoro
A cold in the head	Nikohi	Mamila
To trust, confide in	Okabalala	Usunga
To cut	Oleba	Utikila
To return	Okoka	Uhogoloa
To wash clothes	Ovasa	Ukata
To twist or wring out clothes	Owama	Ukamla
To count	Wala	{Wabaya Walakela
To cook	Ochokochia	Wabea
To dish up food	Oravula	Opakula
To turn over an article	Othanusa	Orugunusa
A long, narrow cloth woven in the country and worn by the men .. .}	Mukwagwali	Muzago
To behave well	Wisinanela	Witorata
To behave badly	Wisibanera	Wirazonanara
Dust	Opoosu	Ntupi
Cotton	Boboso	Ntoje
The elbow	Ewakwino	Ewakwino
To be unwell	Ohasa	Orapea
The north	Opararini	Opararini
The south	Omirimana	Omirimana
The east	Ohicho	Oti
The west	Ota	Ota
The border of ornamentation generally worked in a cloth of native make .. .}	Waramela	
A sword-shaped rod used for beating the threads together in weaving .. .}	Nipaga	
The cross rods dividing the sections of the threads}	Mureli	
The uprights used to confine the cross rods}	Makwe ¹	
Long	Wachimpa	Oregama
Short	Anivisi	Okuveha
Broad	Nikulu	Orngu
Narrow	Inani	Oyevorugu
Great	Etokotoko	Yulubale
Small	Inanju	Ekani
Dirty	Otapala	Onyala
To look at	Ovaria	Oweha
To jump	Ovalo	Otupa
To tread on the foot	Okipirimita	Okinyakela
Sterile ground	Kokòchela	Olipa (?)
Damp ground fitted for the growth of rice}	Muyisi	Vowoloa
The raised bed on which potatoes are grown}	Ekudu	Ntutu
An idle, inapt person	Orushiwa (?)	Wobana
The heel	Enyukinyuki	Enao
The knee	Nikokoro	Nikuta
To be unfortunate, unlucky	Uchilu	Othakalia
Bone marrow	Nihiro	Okogo
Trade	Marota	Maronja
The jaw bone	Nanjere	Ntere
Mother	Maa	Maa

English.	Ki-Lomwe.	Ki-Makua.
Yes	Eyo, Eya	Zizo
No	Hoi	Hatia
A woman who has given birth to children	Myebele	Namwana
An old man	Ovela	Uluvala
A hippopotamus	Epwitu	Tomondo
Cassava	Ebana	{ Mandioca Muhogo (S.)
Kaffir corn	Tokoli	Mele
To marry	Otela	Woria
Wooden trough used for pounding and cleaning corn	Erawe	Iriawe
To sew	Oshoma	Otota
To take leave of	Oyeha	Uwaresha
To rot	Osugumana	Unda
To forget	Ojiwala	Uliala
To consider, think	Otananela	Ubuela
To be bound	Omagiwa (?)	Utugiwa
To be unbound	Otapuliwa	Utuguliwa
Fibre cord used for binding the hair	Ekopoti	Ekopoti
Sense	Mirugu	Akili (S.)
A mark	Ikori	Alama (S.)
An order	Naruruma	
The present carried to the graves of the dead when on the eve of a journey, &c.	Epepa	
Opium (?) or the extraction of a herb which when weakened with water is drunk with effects similar to opium	Malava	

The foregoing Part I. of Mr. O'Neill's paper was read in abridgment, followed by Part II., by Mr. W. H. WYLDE, who prefaced the reading by a few remarks in which he said that it was in the early part of last year that Mr. O'Neill, having obtained six months' leave of absence from the Foreign Office, commenced preparations for his projected journey, which were completed by the beginning of the month of June. The limited time would not permit his reading the first part *in extenso*, though this journey from the coast to Lake Shirwa was one of very considerable interest, describing as it does a new route from the coast to the lake, and passing through a friendly country where no great difficulties were encountered and where the chiefs are less extortionate than on other routes followed by previous explorers.

After the paper,

The Rev. HORACE WALLER said it was his good fortune some years ago to see Lake Shirwa and the mountain to the north of it, and he well remembered how often the subject was discussed by Dr. Livingstone and Dr. Kirk. All who had listened to the paper must acknowledge that Mr. O'Neill's exploration was one of the most minute and painstaking pieces of work that had ever been laid before the Society. We were indebted for the paper to what might be called a new departure. It had been wisely seen that to keep a man tied down to his post at a place like Mozambique was simply death to him. Roving commissions were now given to the Consuls, and the result was that they maintained their health and sent home most valuable information. Dr. Laws, who had resided on the western side of Lake Nyassa for seven years, had arrived in London, and Mr. Johnson, who had been on the east side, was near at hand. He therefore hoped that the Society would soon have a thoroughly good paper read on Lake Nyassa, and then an opportunity would be given to do honour to Dr. Laws whom he regarded as one of the most valuable men who ever entered Central Africa.

Lake Shirwa certainly could not have an outlet. It was now tolerably well proved that it was a huge evaporating pan. At Nyassa there was a gradual desiccation of the country going on, and he had no doubt that Mr. O'Neill was perfectly right in saying that the lake Shirwa was gradually drying up. In Livingstone's time there might have been an outlet, and in wet seasons there probably was, but Mr. O'Neill's painstaking exploration had virtually cleared up an old difficult point in African exploration. In the paper the lake was called Kilwa, and that was no doubt what the natives on the east side would call it, but those on the west would use the word Chiroa or Shirwa. All those who looked forward to a better state of things in Africa must be thankful to Mr. O'Neill for stating that at an elevation of 3000 feet a healthy country was to be found. A great many lives were lost because men would content themselves with sticking about the swamps and on the rivers, whereas if they went up to higher levels they would enjoy tolerably good health. The ascent to the highlands was generally followed by an outbreak of fever, but that was caused by change of air, as was frequently the case with agues in this country. Fever poison might be latent in persons near the rivers, and be developed when they went into the hills, but the fever in such cases was of a modified form, and was soon over.

Mr. F. HOLMWOOD said that some one had referred to the necessity for great pedestrian powers in an African explorer. He could vouch for Mr. O'Neill's qualifications in that respect, having recently accompanied him on a long walk at Zanzibar, when, though only recovering from a severe attack of African fever, Mr. O'Neill had got over the ground at a pace few would care to keep up with.

The PRESIDENT, in proposing a vote of thanks to Mr. Wyld for his kindness in reading the extracts from the paper, said it was extremely difficult to follow the minute geographical details, but the account of the people Mr. O'Neill met with on his way to the lake aroused the desire to have a fuller account of them. They appeared to be somewhat vexed by the slave trade, but able to beat back the slavers. They also formed a kind of parliament of their own and had a sort of federal council which decided questions of peace and war, and they received strangers with kindness. They also manufactured iron and cotton, and in fact had a very considerable amount of civilisation under extremely adverse circumstances. The ease with which Mr. O'Neill had traversed the country would no doubt soon encourage other persons to go there, and thus the geographical knowledge of the district would be increased. It was also quite clear that there was no longer any mistake about the sources of the Lujenda, and that whatever it had been in the past Lake Shirwa was now nothing more than what in Scotland was called a tarn, a great pool like Lake Fucino in the middle of the Apennines, without an outlet. Lake Fucino had had an artificial outlet made for it, but Lake Shirwa had not. It would be interesting to the members to know that the Rev. Mr. Johnson had arrived in England, and had undertaken to read a paper before the Society. He had lived for twelve years near Nyassa, and had learned several native languages. He had brought home three lads, who were now being trained on the coast of Devonshire in the management of a steam launch. He was a man of great ability and candour, and no doubt when he read Mr. O'Neill's paper he would see that beyond all question the lake which he took to be the head of Lake Shirwa was really Amaramba.

Captain Elliott's Expedition to the Kwilu-Niadi Valley.

AN account of the expedition sent in the early part of last year by the International African Association, under Captain J. Grant Elliott, for the purpose of traversing the Kwilu-Niadi valley and opening up stations, has now reached us; and, although the results have already appeared upon our maps, some details of the journey itself may not be without interest. The party consisted of Captain Elliott as leader, two Belgian officers, MM. Destrain and Legat, an Austrian, Herr von Schumann, a German, Herr Lermann, and two Englishmen, Messrs. Ruthven and Illingsworth. They reached Vivi in company with Mr. H. M. Stanley on the 17th December, 1882, and on the following 12th January started from that place with 70 Zanzibaris, each carrying a 65 lb. load. There was no food to take, and from this want, mutinous conduct, desertions and sickness, the party was in bad plight after only three days' journey—the country being found by no means so productive as had been stated. A buffalo, however, was shot, and the expedition reached Isanghila on January 23rd—an unusually long time for the short distance. Here further troubles arose, as Messrs. Lermann and Illingsworth succumbed, and had to be left behind, the latter dying a few days afterwards. Starting in a N.W. by W. direction from Isanghila, at the commencement of the rainy season, a fresh misfortune awaited the party in the loss of their only interpreter, who deserted about six days' march from the Congo; and here, in consequence of a native being wounded by the accidental discharge of the rifle of a Zanzibari, a hostile attack in force was with difficulty averted. Having satisfied the injured man and his family in the usual way, the expedition continued in the same direction as before, guided by compass only, and arrived in fourteen days at two magnificent ranges running east and west, with a lovely valley between them as far as the eye could reach. These were respectively named the Des Barres and Rudolph ranges, and the Stephanie valley, the latter being watered by the Ludima river, afterwards found to be an affluent of the Niadi (or Niari). Here the introduced pine-apples and papaws abounded, and antelope and buffalo were seen in numbers, leopard tracks being also frequently observed.

At a village in these Des Barres mountains, where copper and iron abound, a primitive forge was seen at work, rings, anklets, and fetiah ornaments being welded into shape by native-made hammers; artistic pipes, drinking cups, and gourds of clay were also manufactured, chiefly by the women, who wore ivory arrows through their noses, ears, and hair, and were mostly tattooed over the whole of the back and front of the body. Splendidly worked mats and waist-bands were here made from dried grasses, and often dyed black; the musical instruments were also very interesting.

Continuing through forests and high hills, one of the remaining white members of the party received a sunstroke, and caused much danger and anxiety to the others. Undulating country, covered with the long grass, 14 to 16 feet high, so distressing to travellers in Africa from its retention of wet, was reached after the high land, and on the 25th day from Isanghila the Niadi was struck at a village called Tandu.

After a rest of four days here (where, as in the earlier part of the journey, they met with fair civility from the natives) the expedition followed the south bank of the river, proceeding due west to find the junction with the Ludima, and arriving at the village of Kimbanda on Feb. 22nd. Here all the white men but the leader were for the time disabled, and he crossed the Ludima alone, finding a spot near the confluence for the first station of the Association on the Upper Niadi. This was founded six days later, with permission of the chief M'Goonga Wali, and named after the Princess Stephanie, Crown Princess of Austria and daughter of the King of the Belgians. The exact position, as subsequently ascertained by Mr. E. Spencer-Burns, F.R.G.S., is $8^{\circ} 58' 55''$ S. lat., and $13^{\circ} 14' 27''$ E. long., the original compass reckoning being seven miles wrong.

M. Destrain and five Zanzibaris were left in charge of this new post, and Captain Elliott, in pursuance of instructions, determined to trace the course of the Niadi, which had been supposed by De Brazza to join the Lalli and run into the Kwilu about 80 miles from the coast,—an erroneous idea, as the Kwilu and Niadi are identical, and the Lalli is an affluent of the Luasa, which reaches the Kwilu-Niadi about $3^{\circ} 12' 7''$ S. lat., and $12^{\circ} 27' 20''$ E. long. The river ran northward and was followed to Kingi, where the party rested, Von Schaumann suffering terribly, and being lashed to a mule which had been brought from Isanghila, and caused much wonder among the natives, who called it "Big White Goat." A friendly visit by a local chief was received at Kingi, and the territory of a dreaded "Poison" chief, through which no guide could be induced to travel, was safely crossed by the aid of presents. From many hills crossed here and subsequently, it could be seen that the Niadi ran through a magnificent valley, across which, running north-west from Stephanie-ville, was a splendid unbroken range of very high and wooded hills, named the Strauch Mountains. Arriving at the village of Hanga on March 13th, a portion of the Zanzibaris mutinied, fourteen deserting with their leader, thus necessitating the destruction of part of the baggage for want of bearers.

This danger passed, the remainder of the expedition turned N.W. by W., and reached the confluence of the Niadi and Luasa, into which latter the Lalli runs about 90 miles north-east. Here another station was formed, and called Frank Town, the remaining Belgian officer, M. Legat, being left in charge. Still following the river, now in a south-western direction, Captain Elliott in 12 days reached the village of Mensuka,

after frequently cutting a way through forests and fording streams. Standing on the Susu Hill (about 4000 feet above sea-level), nothing could be seen but interminable forest-covered elevations, and it was ascertained from the natives that the most arduous 15 or 20 days' travel remained before a white man could be reached. Von Schaumann, who died on the voyage home, was still hopelessly ill, the only other officer was in a deathly stupor from sunstroke (he eventually recovered), and the leader was covered with painful ulcers, much emaciated, and with bleeding feet; nevertheless, he made an attempt to push on by himself for help, and four days afterwards, when on the point of succumbing, met with a native sent on by M. Van de Velde, who had been despatched by Mr. Stanley to succour the party, and was still seven days off at Kilabi (since formed into a station called Taunton-ville). Captain Elliott and his two companions succeeded in reaching the coast, having travelled 600 miles in $3\frac{1}{2}$ months; and he has subsequently thoroughly explored the Kwilu-Niadi river and valley with Mr. Spencer-Burns and MM. Mikic and Destrain.

The district has for the most part been freely ceded by the natives to the Association, and formed into a province, in which there are 15 stations, under Captain Elliott as administrator, with a staff of 28 officers and about 250 men.

Dr. Güssfeldt's Work in the Andes.

THE results of Dr. Paul Güssfeldt's journey in the central Chilian-Argentine Andes have recently been communicated to the Berlin Academy of Sciences, and we are indebted to the courtesy of the traveller for an early separate copy of his preliminary account. His explorations extended from November 1882 to March 1883, in the wild and lofty mountain region containing Aconcagua, the most elevated known point of the American continent, which lies between 32° and 35° S. lat., and is limited on the east by the Argentine Pampas and on the west by the Pacific. For scientific purposes, this was practically a pioneer journey, as the country is only known in its lower elevations, or along narrow cross mule tracts. Already trained for mountaineering by his experiences in the European Alps, and to the use of scientific instruments during his journeys in Northern and Equatorial Africa, Dr. Güssfeldt set himself the daily general task of observing the great orographical and landscape features, the glacial conditions above the snow-line, the character of the vegetation, and the phenomena of rock weathering; as well as the special duty of fixing positions astronomically and taking altitudes, for which purposes he was provided with nineteen instruments of various approved kinds. The central Chilian-Argentine Andes,

which are peculiarly adapted for showing the influence of climatic and meteorological factors in the modification of surface features, are sketched by Dr. Güssfeldt as two parallel chains, having on the Pacific side an outlying coast range. The western chain is the true water-parting of the Atlantic and Pacific, and the eastern is in many places broken through by the waters rising in the great trough between the two chains, which has no well-defined valley formation, indications of a longitudinal depression being only found at intervals, constantly interrupted by cross ridges. This trough or basin is of the highest orographical interest, and affords a problem yet to be solved. It is about 185 miles in length, entirely uninhabited, with a mean elevation probably over 9800 feet, only in a few places crossed by mule paths; and presenting such difficulties of travel in its axial direction as trained mountaineers could scarcely cope with, but which must still be overcome by the indispensable mule caravans; to these impediments, it must be added that even scattered localities where food could be obtained are unknown, and that three months of the year at most are available for exploration. For a thorough exploration of this region, Dr. Güssfeldt is of opinion that the native guides, though very serviceable, are not enough; without Alpine guides from Europe, the traveller is like a man in fetters, and it is only as an exception that he can reach the panoramic summits affording views essential to his undertaking. From his remarks it is clear that care must be taken in the selection of even experienced Swiss guides for this work (Mr. E. Whymper's success, however, has proved that thoroughly efficient men can be obtained). The outer flanks are equally complicated; and a very characteristic feature in the structure of the chief valleys is indicated by the term "cajon" (box or chest) applied to them, instead of the usual word "valle"; each is, as it were, a basin with straight sides, having a separate vegetation-zone, limited by perpetual ice. These valley sides are composed of boulder slopes and wall-like outcropping rock, the latter generally showing distinct traces of stratification or bench formation, presenting the appearance of projecting and almost horizontal bands, thrown in relief by their differences of colour. The diversity and richness of the tints of soil and rock are indeed material points in the landscape, as the vegetation, in some places of great luxuriance, is as a whole of irregular distribution, to such an extent that belts and not lines of the flora are capable of definition. The snow limit is also not to be rigidly fixed, and for the like reason, the number of factors and local influences.

At the four points where Dr. Güssfeldt crossed the divide, he obtained the following altitudes:—Atravieso de la Leña, 13,474 feet, Paso del Maipo, 11,394 feet, Cumbre Iglesia, 12,303 feet (on the Uspallata road), and Boquete del Valle Hermoso, 11,696 feet: the crest-line between these elevations was estimated to reach over 19,600 feet. The passes of the second chain reach similar heights (13,779 feet, 12,270 feet, and

9494 feet). The highest elevations are in the neighbourhood of Valle Hermoso, not on either the eastern or western main cordillera, but apparently on lateral spurs of the chief western chain. The mountain land forming the left northern side of Valle Hermoso comprises the Ramada range, with peaks 19,685 feet, the highest being 21,040 feet. Finally, the great volcano Aconcagua reaches 22,867 feet near the commencement of Valle Hermoso.

The glacial covering of the central Chilian-Argentine Andes is as a whole widely different from the Alpine type. This is perhaps to be referred less to quantity of deposit, than to the structure of the highest points, which is unfavourable for the collection of large glacier-forming masses of snow. The wind also doubtless plays an important part in carrying off the fallen snow; at all events, the north-west side of Aconcagua is entirely free for a belt between 19,685 to 21,653 feet, although it is there of a trough-like construction, affording good hold. Elsewhere, the conditions of position and incline favourable for retention of ice are markedly wanting; and the channels capable of holding extensive glaciers are either climatically too low, or, if high enough, too steeply inclined. The snow-line is often broken by abrupt ice streams wedged between masses of rock, which terminate far above the valley bottom; and even where sufficiently broad channels communicate with a slope covered with perpetual snow, the descending ice disappears before reaching the base. Dr. Güssfeldt discovered, however, one ice-stream which appears to form a remarkable exception to the general poverty of the chain in this respect. The head of a side-valley of the Cachapual, called the Cajon de los Cipreses, is filled by a magnificent glacier (named the Ada glacier) nearly 12 miles in length. The ice has its source in a vast snow basin some 10 miles in length, fed by numerous secondary glaciers, and surrounded by lofty peaks, of which the Gran Onorado, 14,816 feet, is the highest. It escapes from this in an icefall, 8580 feet in length, and of an average slope of $22^{\circ} 15'$. Below the fall, the tongue of the glacier pushes down the valley for 4265 feet more with a slope of $12^{\circ} 45'$ ending (in December 1882) at the height of 6299 feet in a cavern, the source of the stream. There is evidence in the glaciation of the rocks below the present extremity of the glacier, that it once reached a far lower level. A cliff now more than 6000 yards distant from the glacier is covered with glacier marks; and Dr. Güssfeldt's companion pointed out a conspicuous red boulder as marking the point reached by the ice thirty years ago, and which is 5676 feet distant from the present glacier.

The highest peaks but rarely show a continuous snow-cap, as the common formation of abrupt crags leaves the naked rock almost everywhere exposed. Crevassed snow-fields and broken glaciers are thus common phenomena; and Dr. Güssfeldt especially notices some peculiar formations of the upper snow locally called "Penitentes" or pilgrims, most curious

ice-figures, modelled as it were by exposure to a fierce sun out of the ridges thrown up between parallel furrows caused by strong winds blowing on the surface. These figures are sometimes so high that a horseman is hidden between them as if by the tall grass of an African savanna. They were seen in different stages, and were most strongly developed at the bottoms of high snow valleys, in a zone of from 11,483 to 13,779 feet, but also occurred on unfurrowed snow-slopes. As regards the snow-line, its mean is estimated at 13,779 feet, between 32° and 33° S. lat.; 11,483 feet in 34° S. lat.; and 13,123 feet 10' further south; it is beyond question much lower between 32° and 35° than in other parts of the Andes.

Dr. Güssfeldt's tables of astronomical positions, barometrical readings, trigonometrical and magnetic observations, &c., which are numerous, are not capable of condensation: a special section is devoted to the mensuration of Aconcagua, the highest peak of which is given as situated in 69° 59' 5" W. long. and 32° 39' S. lat., and as being 22,867 feet above sea-level. He discusses the question of the effect of rarefied air upon the human frame at great elevations, and from his own experiences is much of the same opinion as that expressed by Mr. Graham during his recent account of his Himálayan work. He and his assistant attained 21,030 feet on Aconcagua, and were able to work their scientific instruments at that height, though not in good condition from anxiety and want of sleep; their lungs were physically exhausted by the effort of speaking, but there was no flow of blood from nose or ears. He says that the so-called "Puna" can be resisted by mental effort and confidence, the only effects upon a properly trained individual being those of increased lung-action, and that any one who could work as he did at 21,030 feet could reach the top of Aconcagua, where the proportion of oxygen is only 6½ per cent. less than at that elevation.

The numerous plants collected are briefly analysed by Prof. Ascherson; the minerals (which establish the volcanic nature of Aconcagua) are to be separately treated by Herr Justus Roth.

GEOGRAPHICAL NOTES.

Lieut. Shufeldt's Explorations in Madagascar.—Lieut. Shufeldt, of the United States Navy, has recently made an important journey across the island of Madagascar in a direction south-west of the capital not previously explored by a scientific traveller. Leaving Antananarivo with a large party, he made for the sources and numerous tributary head-waters of the Zizibongy river, which he thoroughly investigated and mapped, and in descending the plateaux to the south-west coast made accurate observations of the successive escarpments. He travelled

680 miles and reached the coast on the 2nd of July last, having fully accomplished the objects of his expedition. He crossed the Mozambique Channel with a few native followers in an old boat patched up for the voyage, and landing at Mozambique, proceeded to Europe and the States via Zanzibar. Lieut. Shufeldt has promised to send us a detailed account of his remarkable journey, as soon as his Official Report has been published by his Government.

Another Expedition across Africa.—The African International Association is about to despatch another expedition to Central Africa, under the command of Lieutenant Becker. Its mission will be to carry out one of the leading objects of the Association, viz. to cross Africa and connect the station of Karema on Lake Tanganyika with those recently founded by Mr. Stanley on the Upper Congo.

Flegel's Travels in the Niger Region.—Herr Flegel returned to Germany last summer, and gave an account of his recent travels and discoveries in the Niger basin at a meeting of the Berlin Geographical Society on the 4th of October. He had explored during the past two years the whole of Adamawa, and had discovered the sources of the Binue, but his efforts to carry out the mission with which he had been charged by the German African Society, viz. to cross the unknown region between the Binue and the Congo, ended in failure owing to the turbulence and opposition of the native tribes. He spoke highly of the commercial value of the Binue, which he said is navigable for 680 miles.

The Afghan Frontier Mission.—The Afghan Frontier Mission, consisting of 35 Europeans and about 1300 natives (the latter including an escort of 250 bayonets of the 20th Punjab Infantry and 200 sabres of the 11th Bengal Lancers), started from Quetta on the 23rd September, under the command of Lieut.-Col. J. W. Ridgeway. The scientific staff consist of Major J. Hill, R.E., Captain St. G. Gore, R.E., and Lieut. the Hon. M. G. Talbot, R.E., Surveyors; Mr. Griesbach, geologist, and Surgeon-Major J. E. T. Aitchison, C.I.E., naturalist. Colonel Ridgeway's route from Quetta to North-western Afghanistan may be said generally to coincide with Captain Christie's in 1810, though as regards the earlier part it harmonises more closely (though in reverse direction) with that of Sir Charles Macgregor's fellow traveller, the late Captain R. B. Lockwood, when he separated from the former and took a more northern line on his way back to India, apparently with the object of determining whether the Lora and the Helmund had any physical connection, a point which seems to have been clearly decided in the negative. Colonel Ridgeway appears to have passed through Chageh, a square mud-built fort on a level plain just west of the Lora *hamun* or lake in which that river debouches. The fort is surrounded by thirty or forty huts, and the plain affords excellent grazing for camels, while the district boasts of being able to raise a thousand matchlocks. From Chageh three roads

lead across an almost waterless desert to the Helmund, and lists of the stations are given by Captain Lockwood in Sir Charles Macgregor's book,* but it is difficult to say whether Colonel Ridgeway adopted any of these. It seems more probable from his mention of Galichah, which occurs on Christie's route, that he has followed the latter line. The Helmund at the point where these routes strike it, has been visited by several officers. Lieut. Patterson, in 1840, surveyed its course from Kila Beisht at the junction of the Argundab to Rudbar, including the whole country of the Garmail with the positions of thirty-two villages, and thus connected Kandahar with Captain Christie's work. The same route was traversed in 1872 by General Sir Richard Pollock and Dr. Bellew when they made their way through Afghanistan to join Sir F. Goldsmid's mission in Seistan. They left Kandahar on the 13th of February, and reached Rudbar on the 20th, travelling along the banks of the Helmund, which they described as fringed with an almost continuous succession of villages, cornfields, and gardens, while to the south all cultivation is bounded by the desert. Sir Richard took no astronomical observations, but his bearings and distances satisfactorily connect the work of Patterson with that of Captain Lovett, who had carried on his work eastward along the river from Seistan to within about 20 miles of Rudbar.† Onward from the latter point the present Mission will be traversing ground fairly well known to us from the labours of Sir F. Goldsmid and his party. It will, however, be very interesting to learn something about the process of desiccation in Seistan, and what dimensions and form the famous Seistan Lake has now assumed. It will be remembered that at the time of the Seistan Mission's visit there had been five successive years of drought, and the limits of the lake had consequently shrunk enormously, and again, in 1877, Macgregor and Lockwood ran a near chance of perishing from thirst at a point abutting on the former area of inundation.

South Georgia.—Some interesting particulars of the geography, climate, &c., of the island of South Georgia have just been published by the members of the German expedition which sojourned last year at the island. They are of the more interest as no scientific expedition had previously visited the island, of which we know, therefore, but little.—The expedition, in command of Dr. Schrader, took up their quarters at Moltke Hafen, in Royal Bay, which is from $4\frac{1}{2}$ to five miles wide, and from six to eight miles long; here observations were made from September 15th, 1882, until September 3rd, 1883, when the expedition left in a German gunboat. The 8472 observations made during this period on the temperature, air pressure, moisture, wind, &c., are of great importance. The island is by its position ($54^{\circ} 31'$ lat. S. and $36^{\circ} 5'$ long.

* 'Wanderings in Balochistan,' p. 247.

† 'Eastern Persia,' vol. i. p. 291.

W.) not an Antarctic island in the strict sense of the word, but its appearance stamps it as such; Royal Bay being surrounded by mountains with enormous glaciers from 900 to 1200 feet in height, which inland rise to 6000 or 7000 feet. This circumstance may give some idea of the climate, and it is, therefore, not surprising to learn that the mean temperature of the whole period of observation was only 35° Fahr.; for February, the warmest month, 42°, and for the coldest (June) 26·6°. No single month was free from frost, and 30 per cent. of the hours of observation showed a temperature below freezing point. In July the minimum thermometer registered 26·2°, and in February the maximum one 57·2°, the range of temperature amounting to 31 degrees. Clear days occurred in the winter only, the total being eight; whereas the total of cloudy days was 127; the latter were less frequent in July and August. During December not a single hour was clear, and the total number of hours of clear sky was only 269, against 3302 cloudy ones, viz. 38·9 per cent. of the total. Consequently there was much rain and snow, particularly in November and December, which had only one dry day each. Most snow fell in March and least in May. Even the warmest month (February) had 13 days with snow, while the coldest (June) had four days with rain. It hailed on 19 days, principally in December; there were 75 days of fog, but it did not last long.—As regards winds and storms, the observations of the expedition seem to indicate that the neighbourhood of Cape Horn is not so stormy as is generally believed. At South Georgia there were many days with perfect calm; the summer was, however, more stormy than the winter. The winds came mostly from the west, straight westerly ones being most common, and also from W.S.W. or N.W. The westerly and south-westerly winds were, during the winter, the warmest, which is ascribed to the circumstance that they passed over mountains some 6000 feet in height which rendered them “Föhn-like.” The barometer readings varied between 715 and 770 mm. The lowest readings were never attended by violent storms; these occurred always quite unexceptionably when the glass stood at “fair.” There was no aurora australis, nor thunder-storms.—Explorations of the island were undertaken several times, and many of the peaks in the neighbourhood of Royal Bay were climbed. The slate rocks were very difficult of ascent. The enormous glaciers in the mountains of the interior prevented, unfortunately, any thorough exploration of this part. The mountains sloped often abruptly into the sea, and the highest tops were about 10 miles from the station, and were covered with eternal snow. The roar of avalanches was continually heard.—The fauna was very poor. That such a melancholy climate should boast much of a fauna or flora was hardly to be expected, but nevertheless the mosses were very fine. Dr. H. Will, the botanist, collected about thirty varieties.

Temperature of the Gulf Stream in 1884.—In the remarks appended to the Daily Weather Report of the Meteorological Office for September 26th is an interesting note on the unusually high temperature of the Gulf Stream during the past summer. A comparison has been made in the Office between returns from 28 ships containing 116 recent observations, with the data in the charts of the Atlantic sea-surface temperature (lately published by the Office) referring to the area between latitudes 45° and 55° N. and longitudes 0° to 35° W., i. e. between the latitudes of the north of Ireland and Bordeaux, and extending half-way across the Atlantic; and it appears from this comparison that during last summer the ocean temperature in the course of the Gulf Stream has been abnormally high. In June the whole area was about 3° Fahr. above the mean; in July the half of the area lying nearest to the British Isles was about 1½°, and in August about 1° higher than the mean.

The Gilbert Islands.—From the fact that many of the coral islands of this Western Pacific Equatorial group afford anchorage on their lee side on sandbanks, and that in others the lee or western reef is now wholly wanting, it has been usually believed that the islands themselves are fast wearing away by the action of the sea upon them during the strong western gales; a view considered to be strengthened by the further fact, that, when any of them is exposed, it becomes broken up into a string of detached islets. But we are informed by Mr. Charles Morris Woodford, of Suva, Fiji, who has recently visited the Gilbert Group as Government Agent in the ketch *Patience*, that according to the evidence of a trader residing on Peru or Francis Island, one of the group, the whole of that particular island at all events is rising bodily and noticeably. The trader had been there four years, and when he first came he could come out of the reef passage with a loaded boat at all states of the tide, though at the time of Mr. Woodford's visit the passage was dry at low water. Other indications corroborating this view were shown to Mr. Woodford, and the elevation was estimated at two feet during the four years of the trader's residence.

Annexation of part of New Guinea.—The political geography of Australasia has undergone an important change within the last few days by the resolution of our Government to proclaim the Queen's protectorate over the southern coast of New Guinea, from the meridian of 141° E. to East Cape in Goschen Straits and over the adjacent islands.* The limits towards the interior are not at present defined, but will be eventually extended as far as local circumstances may demand.

'Petermann's Mittheilungen.'—A notification has been received of a change in the editorship and scheme of this important geographical publication. From the 1st of October last, Professor A. Supan has acted

* *Vide* Map of New Guinea in April number 'Proceedings,' 1884.

and will continue to act as editor; and from January 1885 each monthly part will be divided into three chief sections, the first to consist of original articles, not only on geographical explorations and discoveries, but physical geography, anthropology in its geographical aspects, topography, astronomical geography, meteorology, navigation, geology, ethnography, political geography, and statistics. Problems of earth-physics, as well as economic geography and attempts at colonisation, are to receive special attention. The second section is to consist of monthly accounts of the progress of geographical exploration and colonisation beyond Europe; and the third of an analysis of literature (both books and maps). The system of an occasional supplement for the more extensive articles is to be retained.

Death of Dr. Ferdinand Von Hochstetter.—This eminent Austrian traveller, one of our Honorary Corresponding Members, died after a long illness on the 18th of July last. He was a member of the celebrated *Novara* Expedition, and wrote the elaborate report on the geological results of the voyage. But he is most widely known for his work on New Zealand, an English translation of which was published in 1867. He was for some years President of the Austro-Hungarian Geographical Society.

New Geographical Societies.—We are glad to learn that a British Commercial Geographical Society is likely to be established in the city of London. A provisional committee was formed at a preliminary meeting on the 15th of July, and a public meeting to discuss further the subject was held at the Mansion House on the 27th of October.—A Geographical Society has been started in Manchester under influential guidance. The commencement was made at a meeting on the 16th of October, at which the Mayor presided, and speeches were delivered by Mr. Armitage, M.P., Mr. Slagg, M.P., Mr. Hutton (the President of the Manchester Chamber of Commerce), the Bishop of Salford, and others. On the 22nd of October Mr. H. M. Stanley gave a lecture at the Free Trade Hall, Manchester, in support of the movement.—We hear that a Scottish Geographical Society is also to be soon established, with its seat at Edinburgh.

Erratum.—We are requested by Sir Henry Lefroy to insert the following correction of a mistake in his address to the Geographical Section at Montreal (*ante* p. 586, line 3 from the top):—Instead of “neither of these explorers,” it should have been “the latter of these explorers.”

PROCEEDINGS OF THE GEOGRAPHICAL SECTION
OF THE BRITISH ASSOCIATION.

MONTREAL MEETING, 1884 (*continued from p. 606*).

Friday, August 29th.

The Remarkable Journey of the trained Indian Explorer A. K. on the Frontiers of India and China. By TRELAWNY SAUNDERS.—The work of this native scientific explorer, trained by the officers of the great Trigonometrical Survey of India, has thrown a light over regions on the eastern frontier of India, partly traversed before by the French Fathers Huc and Gabet, by Manning and Bogle, Turner, Nain Singh, and Prejevalsky. Besides these this native explorer has penetrated into new regions of which our only ideas were derived from D'Anville's 'Atlas de la Chine,' containing the maps of Tibet, derived from the surveys of Lama priests, made in continuation of the great Jesuit work under the orders of the famous Emperor Kuenlen. It has been all along a most interesting feature of the researches of our native explorers in Tibet that they have in a remarkable degree confirmed these Tibetan surveys, allowing some little differences easily recognised. In the present case the explorer A. K. has struck an entirely new path with the most instructive and valuable results. Leaving Prejevalsky's route at a point near the sources of the Hoang Ho he struck a river which, on placing a reduction of his work upon a reduction of the Lama survey on the same projection and scale, falls exactly, without any exaggeration, upon the course of the Murus Ussu or upper waters of the great river Yang-tse-Kiang. Nevertheless, the conclusions adopted in Calcutta make this river to be the Yalung, one of the great affluents of the Yang-tse-Kiang. The journey abounds in other points of the greatest interest, which will appear in a fuller report now in preparation at the India Office.

The First General Census of India. By TRELAWNY SAUNDERS.

North Borneo. By E. P. GUERITZ.—The object of this paper, as stated by the author, was to give a short and general sketch of the territory belonging to the British North Borneo Company, from personal observations made during a residence of nearly three years in the country and from the official reports of Messrs. Pryer, Von Donop, F. Hatton, and Wittl.

Mount Roraima in Guiana. By EVERARD F. IM THURN, M.A. OXON.—The few notes which I am about to put in order, concerning that strange and little-known sandstone tract of British Guiana which is distinguishable as containing perhaps the most remarkable mountain in the known world, Roraima, arc, I confess, gathered from no personal experience—for I have never been further than the very outskirts of the district in question—but are gathered from the scanty accounts of the very few white men who have ever seen that mountain.* I have, however, a sufficient excuse for breaking through a rule which is generally so wisely observed, in that I am about to make an endeavour to explore, for the first time to pass completely round, and if possible to ascend, this remarkable and mysterious

* It is perhaps not strictly accurate to describe Roraima as in British Guiana, which is separated at that point from the Brazils and from Venezuela by no very certain boundary. The boundary usually entered in maps is that which was laid down, about 1840, by Sir Robert Schomburgk, but this has never been officially accepted. Roraima may, however, be said to be on the border of British Guiana, but in territory which might be claimed either by Brazil or Venezuela.

Mount Roraima; and I find it necessary to invite assistance for, and therefore to attract attention to, my project.

In the beginning of the present year I issued a privately printed appeal for funds to defray the cost of this expedition. That appeal was at once most kindly taken up and urged by, among others, Sir Joseph Hooker, Professor Moseley, and Mr. P. L. Sclater; and it has, consequently, been most promptly and liberally responded to by the Royal Society and by the Royal Geographical Society, each of which has voted a sum of 200*l.* for the purpose of the expedition. The required amount is so nearly, though not quite, met by these votes that I am determined to avail myself of certain present favourable opportunities, and to start for Roraima in October, trusting, as I think I am justified in trusting, that the deficient amount may be granted, perhaps, by the British Association, in time to allow the enterprise to be completely unhampered by any insufficiency of means.

Roraima is a very extraordinary, pillar-like, flat-topped sandstone mountain, the most remarkable of a very remarkable group, all of somewhat similar character, which stand in the sandstone region of Guiana in latitude 5° 9' 40" N. and longitude 60° 48' W.* The plain from which it rises has been estimated at 4925 feet above the level of the sea; † from that level the mountain slopes gradually upward till it reaches a height of above 5500 feet over sea-level; and this slope is crowned by a perpendicular-faced, column-like table-land variously estimated at from 1400 to 2000 feet. From its summit, leaping down this enormous cliff, spring various cascades, the sources of rivers which, all starting from this one small point, flow apart to swell the Orinoco, the Essequibo, and the Amazons.

But such statistics and dry facts can give but little idea of this wonderful place. From them neither can my readers gain any vivid idea for themselves, nor can I draw material for any vivid description of my own. I can, therefore, but quote the words of one of those who, more fortunate than I have yet been, have seen Roraima. Sir Robert Schomburgk wrote—"Before sunrise, and half an hour after, Roraima was beautifully clear, which enabled us to see it in all its grandeur. Those stupendous walls rise to a height of 1500 feet . . . They are as perpendicular as if erected with a plumb-line; nevertheless in some parts they are overhung with low shrubs, which, seen from a distance, give a dark hue to the reddish rock, and an appearance of being altered by the action of the atmosphere. Baron von Humboldt observes that a rock of 1600 feet of perpendicular height has in vain been sought for in the Swiss Alps, nor do I think that Guiana offers another example of that description. A much more remarkable feature of this locality, however, lies in the cascades, which fall from this enormous height, and, strange as it may appear, afterwards flow in different directions into three of the mightiest rivers of the northern half of South America, namely the Amazons, the Orinoco, and the Essequibo. . . . The summit of the mural precipice is somewhat rounded, and overgrown with shrubs; but that part which rises in a rounded form over the walls must be of inconsiderable elevation, perhaps not more than 50 feet; nevertheless, at this height from the summit, where the mountains assume the wall-like appearance, the supply of water is so great that it falls in streams and forms the wonderful cascades for which Roraima is famed among the Indians, who in their dances, sing of the wonders of 'Roraima, the red rock, wrapped in clouds, the ever fertile source of streams!' . . . Roraima and the neighbouring mountains repre-

* This is the determination of the easternmost point of Roraima itself by Sir Robert Schomburgk.

† See 'Reports on the Geology of British Guiana,' by Charles B. Brown, F.G.S., and J. G. Sawkins, F.G.S. London, 1875, p. 24.

sent on a large scale that which the spring of the Brocken in the Harz Mountains offers in miniature, namely, water breaking out from the side of the mountain only a short distance below its summit. . . . Roraima is the most eastern and the highest of this remarkable group of mountains, the greatest extent of which is about 25 miles in a north-west and south-east direction. . . . I can but imperfectly describe the magnificent appearance of these mountains, with their thundering and foaming cataracts. They convey the idea of vast buildings, and might be called Nature's forum; or, associating them with those splendid remains of man's gigantic conception and execution, we may imagine them what the Forum would have been if its columns and walls could have been raised to a height of 1500 feet, and if it had covered an extent of 10 miles."

The flora of Roraima is of quite unusual beauty and interest; and it would be easy to fill many pages with quotations expressing the rapturous delight of the two brothers Schomburgk and of Karl Appun concerning the vegetation of this district, where almost every plant they met with was new, often alike to their experience and to science, beautiful, or quaint of form. But considerations of space compel me, rather, to put together the general results of the statements of these botanists on this subject. None of the three had ever seen the Kaieteur Savannah, situated at a distant point of the same sandstone tract; or they would have realised that the very peculiar and characteristic flora of the sandstone of Guiana is not restricted to the immediate neighbourhood of Roraima, as they imagined.* But though the flora of the whole of this tract shares, in some measure, in this peculiar character, it is just round about Roraima itself that this character attains its chief and marvellous development. This is of course principally due to the fact that Roraima is at once the highest point above sea-level, and is ever surrounded, because of the many rivers which fall from its crown, by an extraordinarily moist atmosphere. To the latter, especially, of these causes is due the extraordinary development in the fern-flora of Roraima; Appun makes a calculation, avowedly rough, that at least 200 species of ferns grow on the mountain, and that of these, probably, half are peculiar, or almost peculiar, to it. Tree-ferns and filmy ferns, neither of which, considering the tropical nature of the country, are conspicuously abundant elsewhere in Guiana, seem to form almost the most prominent vegetation about Roraima. There, too, palms and cacti are unusually abundant, and many of them certainly peculiar; and this is also true of the various and innumerable orchids. Quite peculiar forms of plants, such as the *Befarias* resembling the heaths of colder climates, and, most strange of all, at least one "pitcher-plant" (*Heliamphora*) occur in such abundance as markedly to characterise the scenery. In short, an extraordinarily large number of its plants are peculiar to Roraima, and almost all of them are of unusual beauty, or are strange in form, or perhaps both. And, though the two Schomburgks and Appun all collected, comparatively few of these interesting plants have as yet been gathered.

As with the flora so with the fauna, except that the latter, though equally peculiar, seems to be by no means so abundant. Even the Indians of the district, the *Areconas*, are less known, and appear to have been less affected by the influence of white men, than those of any other district of the Colony. In short, according to all accounts, Roraima stands in a true wonderland, filled with things rare and beautiful and strange.

I will say little here—for I confess I am somewhat incredulous—of the primitive

* A very instructive paper on "The Aspect and Flora of the Kaieteur Savannah," by my friend G. S. Jenman, F.L.S., is to be found in the first volume of *Timehri* (Demerara and London), 1882, p. 229.

forms of animal and plant life which have been supposed to survive and linger, shut into their own small world, and shut out from the rest of the world by the mighty and steep cliffs which lift them high up into the clouds. It is a pretty idea, that of a small primeval world—a fossil world as it were—lost for ages up in the clouds, to be found some day, and then to afford enormous enlightenment to men as regards the history of the past. Even without this—in which I wish I could believe—there is enough, and more than enough matter for study about Roraima.

The whole sandstone tract which, roughly speaking, forms one-half, as the, chiefly granite, savannah forms the other half, of the interior of British Guiana, has been less visited, less thoroughly explored, than almost any other part of this insufficiently known colony. Yet it is of all the most interesting; for it includes within its limits the two, by far, most remarkable physical features of Guiana, namely, Roraima and the Kaieteur waterfall, on the Potaro river. The obvious reason for the comparatively very insufficient exploration which has been made of this interesting district, and especially of Roraima, on its farthest borders, is to be found in the fact that, though it is the fruitful mother of many streams, the district itself is traversed by no large river such as might afford an easy waterway for the boats of travellers who would penetrate it; and, at the same time, its many and abrupt mountains, together with the scantiness of its population, render it no easy matter to traverse the district on foot. It is true that close along the northern limits of the tract the important river the Mazeruni passes, the headwaters of which rise within, and emerge from, this very district; but its lower course is much obstructed by falls, and that part of its upper course which runs within the sandstone tract, and even for some distance beyond, is so circuitous, so much obstructed by rocks, as to be practically impassable for boats. Again, roughly parallel to, but at a very inconvenient distance from, the southern limits of the district runs a large and comparatively easily navigable tributary of the Essequibo, the Rupununi.

Inconvenient as these are, when regarded as roads to Roraima, one or other of these two rivers, either the Mazeruni on the north or the Rupununi on the south, has invariably been the chosen way of the few travellers to our wonderful mountain; and, in either case, these travellers have been obliged to leave their boats at points far distant from Roraima, which they have had to approach on foot, carrying with them all the large store of provisions required in a very sparsely inhabited country, and journeying for many days along mountainous and, even to the Indians, little known paths.

So but few have ever seen Roraima. From a passage in his 'Discovery of Guiana,'* it seems probable that Sir Walter Raleigh heard some vague rumours of the mountain. He wrote of it—"I was enformed of the mountain of Christall, to which in trueth for the length of the way, and the evil season of the yearo, I was not able to march, nor abide any longer upon the journey: we saw it a farre off and it appeared like a white Churche towre of an exceeding height. There falleth over it a mightie river which toucheth no part of the side of the mountaine, but rusheth over the top of it, and falleth to the grounde with a terrible noyse and clamor, as if 1000 great belles were knockt one against another. I think there is not in the world so straunge an overfall, nor so wonderfull to beholde: Berreo told mee it hath Diamondes and other precious stones on it, and that they ahined very farre off: but what it hath I knowe not, neither durst he nor any of his men ascende to the toppe of the saide mountaine, those people adjoyning beeing his enemies, and the way to it is so impassible."

* Hakluyt Society's edition, 1848, p. 101.

But, in modern times, the first white man to gain any definite notions about Roraima, seems to have been Robert, afterwards Sir Robert Schomburgk, who, when under the auspices of the Royal Geographical Society he was exploring the then almost completely unknown interior of British Guiana, ascended the Essequibo and the Rupununi, at the end of 1835, and spent some months in the neighbourhood of Pirara, an Indian settlement not far from the banks of the latter river. The accounts which he heard there of a remarkable mountain were such as to make him eager to see for himself. This he accomplished in 1838, approaching Roraima from Pirara (on the Rupununi), and viewing the mountain, the wondrous features of which more than satisfied his expectations, from the south and south-east.* I have already quoted some of the impressions of the mountain and its fellows gained by him on this first visit. A few years later, in 1842, he again visited Roraima, in company with his brother Richard, who is now, in this present year, the honoured curator of the Botanic Gardens of Adelaide, South Australia.† The latter, an excellent botanist, has given a marvellous account of the wonderful plant-wealth of Roraima. The brothers on this occasion again saw only the southern and south-eastern fronts of the mountain. One of them, Richard, though surely on somewhat insufficient data, pronounced it inaccessible.

The next European to see Roraima was again a German and a botanist, Carl Ferdinand Appun, who, being employed by some of the leading colonists to collect specimens for the British Guiana Museum, visited the mountain in 1864, remaining in its neighbourhood for nearly a month. He reached the plain at the foot of Roraima from the Mazeruni and its tributary the Cako, after a long and tedious land journey from the head of the latter river.‡ He examined the mountain, and even ascended to the base of its perpendicular, cliff-sided cap, both on the eastern and southern sides; and he too, taking it for granted that the mountain is as inaccessible on the sides unseen by him as on those which he had seen, pronounced it inaccessible.

Next, Charles Barrington Brown, employed by the Government in making a geological survey of the Colony, visited Roraima in 1869.§ He, following the same route as the Schomburgks, travelled up the Essequibo and Rupununi, and, leaving the latter river at Pirara, walked across the savannah till, after nine days, he obtained a first glimpse of Roraima, and, after another eight days, was able to ascend the mountain at its south-eastern point nearly up to the base of the great cliff. Then, driven by the same cause that had already beaten back the Schomburgks and Appun, want of provisions, he had to retreat. One more, but very distant, view of the mountain he caught, from the north-east, when, in 1872, he had ascended the Mazeruni and approached just within sight of Roraima. He too, from such data as he had thus gathered, pronounced it inaccessible.

The next visitors were Messrs. Flint and Eddington, two travellers who spent

* Sir Robert Schomburgk published his narrative of his two visits to Roraima in the 'Journal of the Royal Geographical Society,' London, vols. x. and xiii. He also republished part of the same matter in a separate book devoted to an account of 'British Guiana.'

† Dr. Richard Schomburgk gave his account, first in his 'Reisen in Britisch Guiana,' Leipzig, 1847-8, and again, in an English version, in his 'Botanical Reminiscences,' Adelaide, 1876.

‡ Appun's account is to be found in the second volume of his 'Unter den Tropen,' Jena, 1871.

§ Mr. Barrington Brown's account is to be found both in his 'Reports on the Geology of British Guiana,' London, 1875, and in his 'Canoe and Camp Life in British Guiana,' London, 1876.

some years in the interior of the Colony, chiefly on the savannahs of the Rupununi, and walked to Roraima from that river, in 1877, the journey to the foot of the mountain occupying eighteen days.* They too, as though some fate impelled all travellers to follow one in the wake of the other, managed to ascend to the foot of the cliff on the south-eastern side; and, being then immediately driven back by want of provisions, pronounced it, with commendable caution, to be possibly inaccessible.

In the very next year, 1878, two other travellers, Messrs. M'Turk and Boddam-Wetham,† visited the mountain, by way of the Mazeruni, and, having walked to it with much labour, first from that same strangely attractive south-eastern extremity, and then from the southern side, both of which, after an admittedly hasty survey, they thought inaccessible. They also obtained, though at a distance, a view of the northern face, which seemed to them as pathless as those on the south and east, and which moreover, the base of the mountain in that direction being surrounded by dense forest,—whereas its southern end rises from an open savannah, they thought would prove almost unapproachable. Then, Mr. Boddam-Wetham writes—"it only remained for us to see what we could of the western side. Of this flank we could only get glimpses by returning toward Kukuenaam, and from savannah hills obtaining a view up the dividing valley. Owing to the clouds which almost invariably filled the gorge, it was seldom that we could enjoy a satisfactory view; but what we did see only convinced us that the western side was a repetition of the others." This passage I have quoted because it gives the only account of the only glimpse—and it was a mere glimpse—which any European has ever had of the western side of Roraima.

To complete the list of visitors to Roraima: in 1881, Mr. David Burke, an enterprising young orchid-collector in the employment of Messrs. Veitch and Sons, visited the mountain, by way of the Mazeruni, and viewed its north-eastern side, but, perhaps more wise in this than some of his predecessors, did not venture, on the strength of so cursory an inspection, to pronounce the mountain either accessible or inaccessible.‡ And, last of all, Mr. Henry Whitely, a very successful collector of birds for scientific purposes, has on several occasions, between 1879 and the present year, spent some months in the neighbourhood of Roraima, and, though as far as I know he has merely stated this verbally, has expressed an opinion that the summit may not be inaccessible.§

To sum up these several verdicts: the mountain has been examined—though even this insufficiently—at its southern and south-eastern points, and also—though still less satisfactorily—on its eastern side; its northern end has been viewed from a distance; and along its western side just one unsatisfactory glimpse has been thrown from a point far to the south-west. The general, but not universal opinion, perhaps under the circumstances somewhat dogmatically expressed, of those who have seen the mountain in these insufficient ways, is that it is inaccessible—unless, perhaps, in a balloon.

* Some account of this visit has been given by Mr. Flint in three papers published in 'Temple Bar,' vols. xlviii. and xlix.

† Mr. Hoddam-Wetham's story will be found in his book, 'Roraima and British Guiana,' London, 1879.

‡ Mr. Burke has published no account of his expedition, but was good enough to give me a MS. copy of his notes.

§ Like Mr. Burke, Mr. Whitely has published no account of his travels. Two papers, by Messrs. Salvin and Godman, on the fine series of birds collected by him in the neighbourhood of Roraima, appeared in the *Ibis* for 1882 (pp. 76-84), and for 1883 (pp. 203-212). [Mr. Whitely's narrative has been published since Mr. im Thurn wrote the above, viz. in the Proceedings R. G. S., August 1884, p. 429.—Ed.]

While I should be far more rash than, as I think, some of these travellers have been were I, who have never yet seen the mountain, to pronounce that most of those who have had that advantage have been mistaken, and that Roraima may probably be ascended, yet I think I may safely venture so far as to say that no traveller has yet had, or at least has given any record of having had, sufficient experience of the mountain to pronounce it inaccessible. Therefore, the chief point of the journey which I now propose to make to Roraima is to acquire the necessary data from which to judge whether or not it is accessible. That is, I propose to examine it as closely as possible, and from all sides. If, in addition to doing this, I am also able to make the ascent—without going up in a balloon, for of trying that means I have no intention—I shall most gladly do so, and only then will the success of the journey be quite complete. Furthermore, as to do that which has already been indicated will necessitate a stay of some duration at Roraima, I propose during that time to examine and collect the flora and fauna, and to investigate, to me the most interesting subject of all, the condition of the comparatively little-known Arecoona Indians, in whose district Roraima lies. Such are the objects which I hope to attain, and for the attainment of which I have already obtained the support of the Royal and the Royal Geographical Societies, and for which I now ask the support of the British Association.

Before closing this paper, it is right that I should give some account of my plan of attack on Roraima.

It has already been explained that the great difficulty which has hindered previous travellers has been the enormous difficulty of the transport of the baggage overland from either the Rupununi or the Mazeruni. My chief thought has therefore been given to meeting this difficulty; and I think that the desired end may be attained by following a river which, as a road to Roraima, is as yet untried. This is the Potaro, which rises in the sandstone tract, at a point not very far distant from Roraima, and forms, almost at the point where it emerges from that tract into the great valley of the Essequibo, the now famous Kaieteur Fall. As I know by the experience gained in my two visits to that fall, the requisite amount of baggage may without much difficulty be conveyed by boat as far as the Kaieteur, and may also easily be carried up to the higher level from which the river there falls.

A mission station of the Church of England has within the last few years been established on the Potaro, originally at the old Indian settlement called Chinebowie (“Enaponow” of the maps), which is situated at a distance of a day and a half’s journey above the Kaieteur; but this has since been partially transplanted to a place called Ichowra, below the Kaieteur, and indeed almost at the mouth of the Potaro. An approaching visit, the first, of the Bishop of Guiana to this latter place, with which visit I propose to make my expedition synchronise, is sure, as always happens in such cases, to attract large numbers of strange Indians, from up the Potaro, from the country about its head-waters, and from the very neighbourhood of Roraima itself. Timing my visit so as to be at the Mission simultaneously with the Bishop, I hope to be able to secure not only much information otherwise difficult to be obtained, but also the services of these stranger Indians both as guides and porters, to obtain sufficient of which is often one of the chief difficulties of an expedition such as the one proposed.

Sending messengers forward from the Mission, I hope to get boats brought down from Chinebowie to the head of the Kaieteur Fall, to which point, as I have already said, transport can easily be managed. Leaving my own boats and a supply of provisions to await our return at the Kaieteur, I hope to proceed in the second set of boats to a point some two days further on, where, as the Indians all say, the Potaro forms another fall, as yet unseen by white men, but equal to the Kaieteur.

As there is by all accounts a portage past this second fall, and as there are many Indians living beyond it, even as far as the head of the Potaro, I hope to pass it as the Kaieteur was passed, to obtain again a new supply of boats from the waters beyond, and so to advance to the Potaro head. From the last-named point, I am assured, there is a comparatively short path which, crossing the upper waters of the Ireng (or Mahoo) river, leads to the head-waters of the Cotinga river, where there are other Indian settlements close under the shadow of Roraima. From the Potaro head to the Cotinga it will of course be necessary to carry the baggage; but the distance is not great, and at a time when large numbers of Indians will certainly be travelling home from their meeting with the Bishop along our very path, this will offer comparatively little difficulty.

It is vain to speak definitely beforehand of such matters; but, roughly speaking, I hope to be at Roraima well within a month of the time of leaving the mouth of the Essequibo, to spend either one or two months, as may seem desirable, in travelling round and about that mountain and in collecting its flora and fauna, and to return either in the third or the fourth month.

POMEBOON RIVER, July 11, 1884.

Friday, August 29th.

Object Lessons in Geography. By E. G. RAVENSTEIN.—The time when our teachers of geography confined themselves to teaching their pupils a "barren list of localities," as Pliny expresses himself, may fortunately be said to lie behind us, and the principles first enunciated by Pestalozzi and Fröbel may be said to have taken a firm root. Nevertheless, many if not most of our geographical text-books are far too abundant in geographical nomenclature, as distinct from an exposition of facts or an explanation of phenomena. I conceive it to be the object of our elementary teaching of geography to make our children acquainted with the locality in which they live; so as to train them to observe, as distinct from merely learning by heart, without digesting, what they find in their text-book; to think for themselves, instead of accepting the definitions presented to them; and to describe their experiences in language of their own selection, instead of merely paraphrasing the language made use of by their teachers. This method naturally compels us to take our children outside the schoolroom, and we can do so by personally conducted tours, or by inviting them to visit certain localities or to observe those phenomena which we desire to discuss during the ensuing lesson in the schoolroom. This lesson would thus be in reality an object lesson, which a lesson merely illustrated by a map, a picture, or a model of the thing to be observed would not be. The children should be encouraged to observe the same phenomenon repeatedly, until they have obtained a clear conception of it; this observation would be followed by a systematic explanation in connection with other phenomena. The child would then once more observe the fact under consideration, with such lights as are afforded by the teacher's explanation; and to this would succeed a final consideration of the subject within the schoolroom or on the ground itself. And now as to the subjects to be dealt with in this elementary stage of geographical teaching. They would include the surface features of our earth, of its vegetation and fauna, and of its inhabitants. We also consider atmospheric phenomena, as well as the celestial bodies, in as far as their movements are visible from our earth. We include consequently not merely what in a strict sense may be described as geography, but also the elements of geology, and of the natural sciences generally, in as far as they serve to explain geographical phenomena. And, moreover, we seek an opportunity of expounding the principles of political economy and of statistics. The range is therefore a wide one. The subjects to be considered would naturally differ according

to the locality in which the school is situated, for during the earlier stages of instruction the children should be limited to objects coming within their own range of observation, and only at a more advanced age, when the power of imagination has been developed, would we carry the minds of our children from things seen to things unseen, though connected with what falls under their personal observation. Thus a consideration of the St. Lawrence and its turgid tributary the Ottawa would carry us in course of time to the great lakes and to your magnificent forests, which explain to us the colour of the waters of your rivers. On no account would I introduce at this early stage a critical consideration of the political or municipal institutions of the country, or endeavour to instil into my pupils feelings of patriotism. The various phenomena would not at first be considered systematically, but as occasion arises. Taking "Rain" as a subject of consideration, I should proceed as follows:—Invite children to measure its quantity, and to consider its nature, whether a mere drizzle, a downpour, or otherwise. Note the seasons of the year when it is most frequent; the winds which bring it; and its general causes. Point out its effects upon the vegetation; its effect in laying the dust, or converting your streets into Sloughs of Despond. Describe the quality of the rain-water; explain why it is soft; account for the hard water of some of our towns; show how hard water may be distinguished from soft. Show what becomes of the rain; how some is carried off by rivers, some sinks through porous soil, and some evaporates; and finally explain the circulation of the waters. I have thus explained, as fully as the limited time at my disposal will permit, the principles which are held by our leading educationalists in organising the elementary instruction in geography. I am aware that this method requires teachers of competence, who are themselves observers, but have no doubt that such will be forthcoming as soon as the principles here advocated meet with general recognition.

Monday, September 1st.

Report of the Committee for promoting the Survey of Western Palestine. By JAMES GLAISHER, F.R.S.

Comparison of the Climates of the Eastern and Western Hemispheres. By J. BEAUFORT HURLBERT, M.A., LL.D.

Dominion Surveys. By TRELAWNY SAUNDERS.—The advent of the British Association appeared to the author to call for a notice of certain scientific points in the character of the Dominion Surveys. In particular he would allude to the maintenance of an attempt devised in times of geodetic ignorance in the United States, and adopted in the Dominion from that source, involving the application of a network of squares to the allotment of public lands for purposes of sale. No doubt the idea of selling lands by the square mile, and division of the square mile, would naturally commend itself to surveyors trained in the management of estates and parishes. But such a method cannot be carried out over the surface of the earth to any considerable extent. It is only on the basis of meridians and parallels that rectangular intersection can be applied over a spherical surface of any great extent. The discrepancies and objections to the system of squares in the United States in time attracted the attention of the General Legislature of the United States, and, in the opinion of the author, it is to be regretted that the conclusion arrived at was a compromise contrary to science, providing a correction at certain intervals. So far from this compromise offering facilities for the uniform allotment of land, it is decidedly the reverse. There can be no difficulty in finding the area in acres or otherwise of any division, however large or however small, on the true geodetic basis of meridians and parallels; and the area being once found between any two parallels, it is of course the same all around the sphere in the same belt and

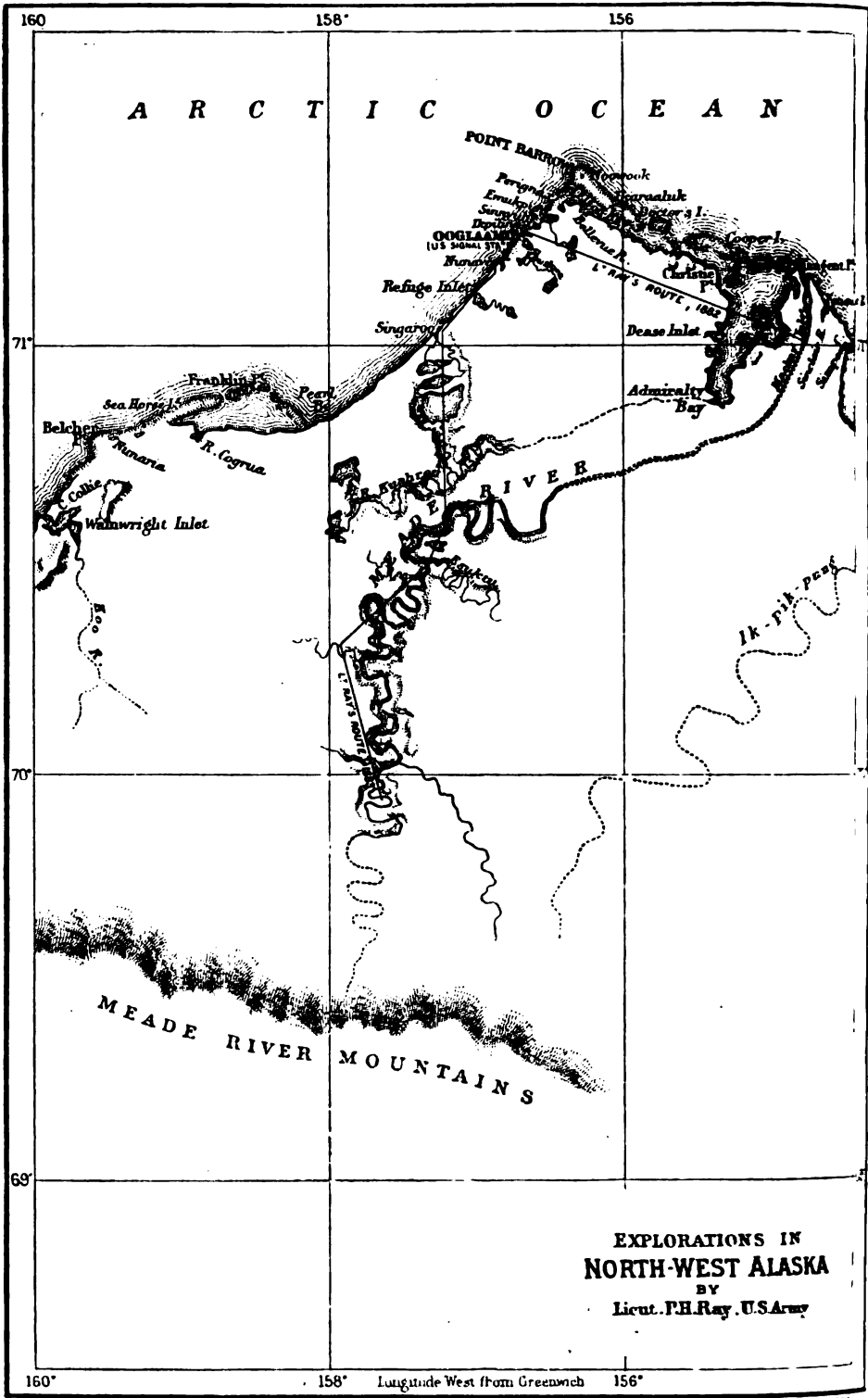
over similar limits. It is also to be observed that boundaries defined under the system of squares, or on any other basis natural or even capricious, can be as easily delineated on the true basis as on the false one. There does not indeed appear to be any sufficient grounds for retaining the unscientific method now in vogue, according to law, in the United States and adopted by law also in the Dominion from the example of the great independent English-speaking republic. Notice is also called to the aspect of these allotment maps. They are rather registers than maps. Registers indeed of the allotment squares and compromise squares rather than maps of the natural features of the ground. Such true maps are, however, far from being altogether wanting, though the public seldom have access to such as are on a large scale sufficient for the study of geographers. The triangulation of both the United States and the Dominion of Canada invites the attention of geodesists, but the subject is perhaps too technical for the present discussion.

Dillon's Automatic Sounder, for preparing Charts, Sections, or Soundings of Lakes, Rivers, or Sea-coasts, &c. By JAMES DILLON, M. INST. C.E.—When exploring new countries, such as Canada, Africa, &c., the geographer or geologist finds it a great source of delay, expense, and fatigue to even approximately determine the character and depths of lakes, large rivers, &c. Vast sums of money will have to be spent on the improvement of rivers, lakes, and other inland navigations in new countries. To determine the cost of such improvements much delay and expense will be necessary, on account of having to employ large staffs of engineers and other competent persons to determine and record on paper, sections, and charts, the character of the seas and inland waters in their present state before estimating the cost of proposed improvements. All this work now to be done by the old and tedious method of sending parties of engineers in boats or ships and sounding for depths with lines or rods during the rise, fall, or flow of the water, making it difficult to define the position of the soundings or height of water, &c. I have found this old method an intolerable nuisance during an experience of twenty-five or more years, and the following is a description of the apparatus proposed by the author:—Over the side of a steamer or boat is hung a long sounding-bar or tube of ten, fifty, or more feet in length; this bar works freely round a fixed centre in the side of the boat. This fixed centre is placed in the centre of a circular dial, on which are marked fathoms or feet, a duplicate dial being placed in the captain's cabin (if used in a steamer). On moving this boat over a shoal rising to the surface of the water, the sounding-bar which always hangs vertically will strike the shoal, and from its weight this bar will rub along the ground, pointing to the number of feet on the dial representing the depth of the shoal under the water surface, as the bottom end of the bar passes over it until the bar reaches the top of the shoal, touching the water surface, when the other end of this bar will point to zero on dial, showing no depth of water. In this way, by rapidly rowing or steaming up or down or across inland waters, perfect records can be had of the depths of the waters by noting same in a note-book, or with the aid of a pencil pointer tracing the outline of the ground under water on an endless roll of paper in the captain's cabin. When running down or up a river, the position of the boat may be determined either by landmarks on the survey of the adjoining country, or by time, or by the number of revolutions of the wheel working at the end of the sounding-rod, or both, the water-levels being recorded on land. How to determine the physical characters of the ground under water:—The smoothness of the ground under water varies from fine mud to silt, gravel, coarse gravel, boulder, and rock formations. It has been found that the vibrations of the sounding-bar differ in degree when the boat moves it along these different formations, thus enabling an observer, after a very short experience, to record in his note-book whether the surface of the ground under water is composed

of mud, silt, sand, gravel, boulders, rock (with or without sea-weed) or trunks of trees. The invention has been successfully used for ten or more years, and is highly thought of by many of the most eminent engineers, as for example, Messrs. Bateman, Abernethy, Sir Wm. Armstrong, and H. F. Perley; and has been subsequently patented by the author.

Tuesday, September 2nd.

Arctic Experiences at Point Barrow. By Lieut. P. H. BAY, U.S.A.—That part of the American coast lying between Bering Straits and Point Barrow is too well known from the reports of English explorers to require further description from me, but that region lying between the Yukon and Arctic Sea has never before been explored until visited by my party. In 1883, accompanied by two natives, I made an expedition 160 miles due south from Point Barrow, striking Meade river 60 miles above its mouth, and followed up its course until I came in sight of a low range of mountains trending north-west and south-east, dividing the north-east watershed from that of Kotzebue Sound. From this point I was obliged to turn back as my native guides refused to go further; they had never before been so far into the interior, and to them all unknown land is peopled with imaginary enemies. I found the country lying along the coast level, about 100 miles back; slightly undulating, the low divides trending north-east and south-west, and the whole region a labyrinth of small lakes, lagoons, and streams, and in summer impassable to any one but a native with his kyak, as all that part which is not covered with water becomes like a wet marsh when thawed by the summer sun, into which the traveller sinks down to the frozen earth at every step. This region is uninhabited and is only visited by a few natives from Noonook and Ooglaamie in the winter in the pursuit of reindeer along Meade river, but we saw several ruins of winter huts, very old, and the natives have a legend that this region was once inhabited but they all perished from famine. All streams of this northern watershed have broad shallow channels owing to the fact that the earth is perpetually frozen, and the summer traveller who sees them full with the waters from the melting snow is apt to go away with the impression that they are large rivers, but they soon run down when the frost seals up their sources and in the winter they freeze solid on the bars and riffles and cease to flow. The region is destitute of timber; a few Arctic willow were found along Meade river; on the dry hummocks and along the sea-shore was found a coarse salt grass, but otherwise the land is covered with a dense growth of moss affording pasturage to the few herds of reindeer found in this region. There is no soil to support vegetation, and the earth was found to be strongly impregnated with salt down as far as we excavated, a depth of 38 feet. After two years' careful observation I am well satisfied that there is no open polar sea from the fact that the temperature of the sea water is unvarying [from the time the sea closes in October until it opens in July, which could not well be the case if there was a large body of warm water lying around the pole, and the atmospheric conditions were found to be such as would not exist near a large body of open water, as in the winter clouds were rarely seen except to the south and west, and there is no precipitation except the frozen mist that drifts in from over the ocean, which is simply the condensed vapour rising from the cracks opened by the gales and tides. The constant crowding down of ancient ice so often noticed by explorers I think can be fully explained. We found that seven feet was the maximum thickness of ice formed over still water on sea or inlet. The Arctic Ocean proper is filled with pack varying from 7 to 100 feet in thickness; its rough broken surface being acted upon by violent gales during the winter, opens cracks of all dimensions from a few feet to one mile in width: these freeze over with great rapidity as the temperature of the water stands at 29° F., and this expansion



forces apart the great masses, and as the depth to which the land will freeze is limited to six and a half or seven feet we have the phenomena of heavy ice replaced by light. This process is going on every day and hour, and the old ice must yield toward the side of the least resistance, which is the lower latitude.

Recent Discoveries in Northern Greenland and in Grinnell Land.

By Lieut. A. W. GREELY, U.S.A.

Map, p. 686.*

The geographical work of the Lady Franklin-Bay Expedition covers nearly three degrees of latitude, and more than forty degrees of longitude. Starting from lat. $81^{\circ} 44'$, long. $84^{\circ} 45'$, Lieut. Lockwood reached on May 18th, 1882, on the north coast of Greenland, lat. $83^{\circ} 24'$, long. $40^{\circ} 46'$. From the same starting-point he reached, to the south-west, in May 1883, in Greely Fiord, an inlet of the western Polar Ocean, lat. $80^{\circ} 48'$, long. $78^{\circ} 26'$. The journey to the northward resulted in the addition to our charts of a new coast-line of 100 miles beyond the farthest point seen by Lieutenant Beaumont, of the Royal Navy. It also carried Greenland over forty miles northward, giving that continent a much greater extension in that direction than it has generally been credited with. The farthest point seen on the Greenland coast was estimated to be about lat. $83^{\circ} 35'$, long. 38° . There were no indications that the farthest point seen was the northern termination of Greenland. The newly discovered coast resembled in many respects that of southern Greenland. The main land was intersected by many deep fiords with numerous outlying islands. The interior of the country, as seen from an elevation of some 2000 feet, consisted of confused masses of mountains, either eternally snow-clad or covered with an ice-cap, the fiords presented to the eye nothing but broad level expanses of snow and ice, being devoid of any marked ice-foot, floebergs, pressed-up hummocks, or any other indications tending to prove their direct connection with the Spitzbergen Sea. In general the immediate coast was high, rugged and precipitous. The formation was very like that around Discovery Harbour; schistose slate with a sprinkling of quartz. The vegetation resembled closely that of Grinnell Land; among specimens brought back, the arctic poppy and several saxifrages were identified. Above the eighty-third parallel, traces of the Polar bear, the lemming, and the Arctic fox were seen, and a hare and ptarmigan killed. At the farthest north a snow bunting was heard. A remarkable fact noted was the existence of a tidal crack, so called for lack of a better name, which extended from Cape Bryant along the entire coast, running across the various fiords in a direct line from headland to headland, and varying from one yard to several hundred yards in width. Inside the crack the rough and hummocky ice was but rarely seen, while outside prevailed the paleocrystic ice, over which Commander Markham struggled so manfully and successfully in his wonderful journey of 1876. Midway between Capes May and Britannia a sounding was made, but no bottom found at 800 feet. Apparently no current existed. It may be well to state that the latitude of the farthest north, Lockwood Island, was determined by a set of circum-meridian, and sub-polar observations, which were reduced by Gauss's method. The latitude of Cape Britannia and several other points was determined by circum-meridian observations. It affords me pleasure to testify to the accuracy of Lieutenant Beaumont's maps. The only correction made places Cape Britannia a few miles south and Cape May a few miles west of their assigned positions. These points were located by

* The map is a reduction of the two sheets of the official map, early copies of which were kindly sent to us from Washington by Lieut. Greely.—[Ed.]

Lieutenant Beaumont from bearings, and his comparative exactness was remarkable, considering the disadvantages under which he laboured.

The journeys made by Lieutenant Lockwood and myself across Grinnell Land, and into its interior revealed striking and peculiar physical conditions which have been hitherto unsuspected. Between the heads of Archer and Greely Fiords, a distance of some seventy miles, stretches the perpendicular front of an immense ice-cap, which follows closely from east to west the eighty-first parallel. Its average height was not less than 150 feet. The undulations of the surface of the ice conformed closely to the configuration of the country, so that the variations in the thickness of the ice-cap were inconsiderable. In about sixty miles but two places were found where slope and face were so modified as to render an ascent of the ice possible. This ice-cap, extending southward, covers Grinnell Land almost entirely from the 81st parallel to Hayes Sound, and from Kennedy Channel westward to Greely Fiord on the Polar Ocean. The glacier discharging into Dobbin Bay is but an off-shoot of this ice-cap, and without doubt glaciers are to be found at the head of every considerable valley debouching into Richardson, Scoresby, or other bays. Several valleys which were visited during the retreat southward displayed at their entrances evident signs of such occupancy in the past. In July I was fortunate enough to ascend Mount Arthur, the summit of which is 4500 feet above the sea. The day was very clear to the northward of the Garfield range, a similar ice-cap appeared to view from which extensive glaciers were projected through every mountain gap; one of these, the Henrietta Nesmith Glacier, had been visited by me in the preceding April, and was found to have a perpendicular face of about 200 feet; it discharged into a small bay, a part of Lake Hazen. Gilman, Abbe, and other glaciers feed streams which empty into that lake. Similarly glaciers were found at the head of rivers discharging into Saint Patrick, Lincoln, Basil Norris bays and Discovery Harbour. From these indications I estimate the northern ice-cap of Grinnell Land as not far from 6000 miles in area. Its southern limit closely coincides with the 82nd parallel. The country between the 81st and 82nd parallels, extending from Kennedy and Robeson channels to the western Polar Ocean, was found in July to be entirely free from snow except on the very backbone. In over 150 miles travel into the interior my foot never touched snow.

Vegetation abounded, being exceedingly luxuriant as compared with Cape Hawkes, Cape Sabine, or other points farther south, visited by me. Dead willow was found in such abundance as to serve for fuel, and in more than one instance willow, saxifrage, grasses, and other plants grew in such profusion as to completely cover large tracts of ground. These valleys afford excellent pasturage for musk cattle, which feeding towards the sea-coast during the summer, withdraw to the interior as winter advances. I frequently noted evidences of the recent elevation above the sea of the region now free from ice-cap. Such indications consisted of raised beaches, marine shells, and drift-wood. At one place the trunks of two large coniferous trees were found in such state of preservation as to allow of their use for fuel. It seems probable that the two ice-caps were originally united. It is certain that both the northern and the southern ice-caps have recently retreated, even if such process is not going on now. Along the front of the southern ice were found many small glacial lakes and moraines. To the north Lake Hazen for some 50 miles borders the ice-cap. In front of Henrietta Nesmith Glacier there were three parallel moraines between the face of the glacier and the main lake.

At the junction of Lake Hazen and Ruggles river I discovered the remains of permanent Eskimo huts. Many relics were obtained at that place and at various points along the southern shore of Lake Hazen, but no traces of any kind were found on the northern shore of the lake. It is perhaps worthy of remark that the

reindeer, which must have been plentiful in that country, have entirely disappeared, having either migrated or become extinct. In connection with the line of perpetual snow, I may state that on Mount Arthur it was not far from 3500 feet above the sea. From barometrical measurements, it appeared that the crest of Grinnell Land was of about 2500 feet elevation in front of the southern ice-cap, and 3000 feet near Mount Arthur.

Your indulgence is asked for any imperfections in these notes. Strength has failed for their elaboration, and my memory has necessarily served me in their preparation as all records and journals are on file in Washington.

A Search for Lost Colonies of Northmen and Portuguese in British N. America. By R. G. HALIBURTON.

Notes on the Lower Basin of the St. Lawrence and the Lake Region of Labrador. By the Rev. Abbé J. C. LAFLAMME, M.A., S.T.D., M.S.G.F.—Having traced the great physical features of the basin of the St. Lawrence, the author pointed out that the hills which bounded the fertile tracts extending along that river consisted for the most part of bare rocks, or were covered with but a thin layer of cultivable soil. These were consequently not fit for agricultural settlement, and the few attempts made in that direction had been given up in despair. Several of the river valleys within this sterile belt were of great fertility. The author next considered the height of land or *Hauteurs des Terres*, to the north of the St. Lawrence, where innumerable lakes and lakelets of limpid water filled cavities in the Laurentian rocks. The smaller of these lakes were no doubt due to glacial action. This, however, appeared not to be the case as to such lakes as the Temiscaming or St. John, which occupied one lake basin, whose origin dated back to a period antecedent to that of the ice age. The Silurian rocks discovered on the margin of the St. John, and the many large rivers which converged upon that lake, clearly demonstrated this. The vast and apparently limitless plain which stretched away from the St. John towards the north and west was destined at no distant period to become an important centre of population. Its clayey soil was of exceeding fertility, and its climate quite equal to that of Montreal. Even now this plain had become the home of thousands of settlers, and the dense forest which covered it was gradually disappearing. The same favourable conditions were to be met with on the banks of the lakes which existed between the St. John and the sources of the Ottawa, as far as the lake Temiscaming. On going still further north we enter a region where there existed sheets of fresh water which fairly rivalled the lakes separating the Dominion from the United States. At present only one of these lakes was known to us by name, viz. the Mistassini, or, as the old missionaries call it, the Lake of the Mistassirinins, but it could hardly be doubted that other lakes of similar size existed in the peninsula of Labrador, thus verifying the assertion of the Indians of old, that in this part of America there was more water than dry land. Our maps of that region were quite misleading. There could be no doubt that Lake Mistassini was larger than Lake Ontario. One of the earliest French missionaries, who had himself visited it, referred to it in an account written in 1672. He said that "it was believed to be so large that it took twenty days to walk round it." Mr. Burgess affirmed that this lake was 150 miles in length and abounded in deep bays. An old trader of the "Compagnie des Postes du Roi," who was stationed on it for several years, took three days to cross it, going from island to island. He supposed it to be 90 miles wide where it is narrowest. "The savages, according to him, usually spent the whole of summer, with a part of spring and autumn, to go from the head of the lake to its foot," and he saw no reason to doubt that it was but little inferior in size to Lake Superior. It appeared clear from this that Lake Mistassini occupied a depression similar to

that occupied by Lake St. John, and as a matter of fact Mr. Richardson, in 1871, discovered extensive beds of Silurian limestone on its shores. This was not, however, the only large lake in this region, for the account of 1672, already referred to, mentioned another large lake, "ten days round, and surrounded by lofty mountains." An exploration of this lake region was a desideratum, and it was a subject for congratulation that the Government of the Dominion had taken in hand this task. Three expeditions had been despatched in the course of this summer, one by way of Lake St. John, a second up the river Betsiamits, and a third from Newfoundland with orders to land scientific observers at various points of the coast of Labrador, where they would spend the winter. The authorities had been induced to take these measures in consequence of the favourable reports which had reached them respecting territories hitherto supposed to be altogether inhospitable. Dr. Bell had drawn attention to the magnificent forests and the fertile soil of Hudson Bay, whilst Mr. Richardson had spoken in high terms of the plain bordering upon the Mistassini. That lake was supposed to lie at an elevation of 1300 feet above the sea, and the height of land which separated it from Lake St. John, itself only 300 feet above the sea, did not exceed 1500 feet. The account of the missionary of 1672 had thus been confirmed. He too had been struck by the beauty and fertility of the country bordering upon that lake, and with reference to Hudson Bay, he said "that in the month of June there blossomed wild roses on its coast, beautiful and odoriferous as those of Quebec, the season appeared to be more advanced, the air balmy and more pleasant." The explorations now being carried on would not only add largely to our geographical knowledge, but could not fail to open up new territories for colonisation.

On Dominion Surveys in the North-West. By LINDSAY RUSSELL, late Surveyor-General.—The author stated that these surveys must naturally interest geographers as they revealed the physical features of a vast continental area. Having referred to the work carried on by individual explorers, he proceeded to sketch the system on which the Dominion lands are laid out into townships, sections, and quarter-sections, the latter being the unit of individual holdings. He explained the necessity of a rapid survey of vast areas, in order that the land might be got ready for agricultural occupation. It was difficult under existing circumstances to provide adequate checks upon unavoidable accumulation of error. Astronomically determined latitudes yielded but comparatively unsatisfactory results on account of relatively large local deviations of the vertical, as was shown in the survey of the International boundary by the joint United States and British Commission. Checks by telegraphic longitudes had only recently been introduced, and it was intended to apply this method more extensively in the future.

The Former Connection between North America and the Eastern Side of the Atlantic. By Prof. W. BOYD DAWKINS, M.A., F.R.S.—The former connection of North America with Greenland, Iceland, and North-western Europe is most conclusively proved by the distribution of the fossil plants and animals in the remote geological past in the eocene and miocene ages. The magnolia, for example, is a form which was abundant in the eocene forests of Europe and the far north of America. The sequoia too, now confined to the slopes of the Sierra Nevada, may be quoted as an example of the vegetation common to North America and to Europe; as well as the fox-grape. The common sensitive fern so usually found in this region occurs buried under sheets of basalt in the island of Mull. The *Lepidosteus* of the American rivers was living in the eocene rivers of the south of England. Among the higher mammalia common to both may be quoted the *Coryphodon*. The route by which the animals arrived is shown by the soundings. The track of comparatively shallow water ranging from Greenland past Iceland to the Faroes and Northern Scotland, and which isolates the deep waters of the Arctic

Sea from the depths of the Atlantic, formed the bridge across which the migration took place, the 500 fathom line representing approximately the line of the ancient shores. This barrier became submerged during the stupendous geographical changes which took place at the close of the miocene age. Then for the first time were the Arctic waters united with the Atlantic, and Arctic shells gradually found their way southwards into the area of the British Isles.

Winnecke's Explorations in Central Australia. By J. S. O'HALLORAN.—An account of these explorations was published in the last number of the 'Proceedings,' p. 566.

This paper concluded the business of the Section. At the Montreal Meeting the following grants were voted on the recommendation of the Geographical Section in aid of expeditions:—100*l.* to Mr. Everard im Thurn, for his exploration of the vicinity of Mount Roraima, in British Guiana; Administrating Committee, General Sir H. Lefroy, B.A., Rev. Canon Carver, D.D., Prof. Boyd Dawkins, Mr. G. W. Bloxham, Dr. E. B. Tylor, Francis Galton, P. L. Sclater, Prof. H. N. Moseley; *Secretary*, H. W. Bates. 200*l.* to Mr. H. O. Forbes, in aid of his expedition to the Mount Stanley Range, New Guinea; Committee, General Sir H. Lefroy, B.A., Colonel H. H. Godwin-Austen, Lord Alfred Churchill, Francis Galton, Prof. H. N. Moseley, Mr. W. T. Blanford, Mr. P. L. Sclater, Mr. Carruthers, Mr. Thiselton Dyer, Prof. Struthers, Mr. G. W. Bloxham; *Secretary*, H. W. Bates.

NEW BOOKS.

(By E. C. RYAN, *Librarian* R.G.S.)

ASIA.

Doughty, Charles [M.].—Documents épigraphiques recueillis dans le Nord de l'Arabie. Paris (Klincksieck): 1884, 4to., pp. 63, maps, photographs, and illustrations.

Mr. Doughty, whose travels in North-Western Arabia and Nejd formed the subject of a paper read by him before the Society on November 26 last, and of which an abstract with map was given in the present volume of Proceedings, p. 382, has received the unusual honour of a publication by the French Académie des Inscriptions et Belles-lettres of his account in full, written (in English) with a certain archaic quaintness of style, illustrated by 28 plates of reproductions of his rough sketches and explanatory notes of inscriptions, &c., 20 further of maps, profiles, architectural remains, prominent scenery, &c., and 9 perfectly executed double-page photographic reproductions of impressions of Nabathæan inscriptions at Medaïn-Salih. These are accompanied by a transcription and translation, and also by a transcript of the notes on the illustrations.

The publication of a work like this on such a scale is apparently impossible in this country; and the French Government has shown great liberality both in undertaking it and in so promptly giving it to the scientific world, at a time when their own scientific explorer, M. Huber (rumours of whose murder have recently reached Europe) was actually engaged upon the like work in the same region. It has been pronounced by competent authority to be the most valuable and important contribution made of late years to our knowledge of the geography, history, and architecture of the north-west corner of Arabia.

India: North-Western Provinces.—The Himálayan Districts of the North-Western Provinces of India. By Edwin T. Atkinson, B.A., F.R.G.S. Vol. ii. (forming volume xi. of the Gazetteer, N.-W.-P.). Allahabad (North-Western Provinces and Oudh Government Press): 1884, large 8vo., pp. xviii. and 964, map in cover, facsimiles, illustrations.

With the exception of an alphabetical list of villages, towns, and local subdivisions in the Himálaya of the North-Western Provinces (presumably to

form vol. xii. of the entire Gazetteer, and vol. iii. of the section Himáláyan Districts), this volume concludes Mr. Atkinson's part of the whole work. Vol. i. (forming vol. x. of the entire series) was noticed *antea* p. 300, and covers the Physical Geography, Geology, Meteorology, and Botany. The present issue discusses Zoology, History, and Religion, and is particularly detailed as regards the Insecta, reviewing the major portion of what has been written regarding India, excluding British Burma, thus being practically a first attempt at a comprehensive view of the species known to occur in India as a whole. Introductory chapters on structure and classification, &c., are given for this part.

In the historical part, the account of the Khasiyas of Kumaon is entirely new; and in examining the connection (which is considered to be fairly established) between them and their Katyúri rulers with the Kho people and Kator rulers in Kashkára at the western end of the Himáláya beyond Kashmir, Mr. Atkinson comes to the conclusion that the time has passed for attributing to the immigration of Aryans to whom the Vedas are owing, the origin of all the races now assumed to be of Aryan blood, or even for holding that all so-called Rajpúts are of Aryan descent. Many of the Rajpút clans can be traced to Bactrians, Parthians, and Scythians; the Aryans of the Vedas soon became absorbed; and the Khasiyas of Kumaon have every right to be considered an Aryan race in its widest sense. Some highly interesting records and explanations of Indian ritualistic ceremonies are given by Mr. Atkinson, who concludes with pointing out anew the evidence of kinship of race shown by the history of thought in India and Europe, almost every theory advanced by Greek and Roman writers having its parallel in India, and curious and startling analogies with the broad beliefs of the inhabitants of European cities occurring in any considerable Indian town.

The map in the cover of the volume is of Garhwál (scale 1 : 380,160, or six miles to the inch), prepared at the office of the Great Trigonometrical Survey of India.

[India: N.W. Provinces]—Statistical, Descriptive, and Historical account of the North-Western Provinces of India. Vol. xiv. Part I.—Benares. By F. H. Fisher, B.A. Lond., and J. P. Hewett, both of the Bengal Civil Service. 1884, pp. 170 and index, pp. iv., maps. Part II.—Mirzapur. Compiled by W. Grierson Jackson, Bengal Civil Service, and edited by F. H. Fisher. 1883, pp. ii. and 229, index, pp. v., maps. Part III.—Jaunpur. By J. P. Hewett. 1884, pp. 147, and index pp. iii., maps. Allahabad (North-Western Provinces and Oudh Government Press), large 8vo.

This volume completes the Gazetteer, according to the published scheme, with the exception of vol. xii. forming vol. iii. of the Himáláyan Districts above referred to. It is on the same scheme as its predecessors, and illustrated by similar coloured sketch maps, the Benares portion having also a plan of the city and cantonments, 1880, scale 2000 feet to the inch.

Mitford, Edward Ledwich.—A Land March from England to Ceylon forty years ago, through Dalmatia, Montenegro, Turkey, Asia Minor, Syria, Palestine, Assyria, Persia, Afghanistan, Scinde, and India, of which 7000 miles on horseback. London (W. H. Allen & Co.): 1884, 2 vols. 8vo., pp. xvi. and 374, viii. and 288 [no index], maps, portrait and illustrations. Price 1l. 4s.

After five years' residence and travel in Morocco, the author conceived and successfully carried out the idea of riding overland to Ceylon, with the object of entering the Civil Service of that colony, of which he is now a retired member, being also a Fellow of this Society. His intention was only to use water carriage at the Straits of Dover, the ferry of the Bosphorus, and the Straits of Adam's Bridge; but circumstances compelled him to make a slight departure from this plan, and he also crossed the top of the Adriatic (Venice to Trieste), and the Arabian Sea from Karachi to Bombay. He occupied two years and ten months on the road, starting in July 1839, and arriving at Colombo in May 1842 (the date 1843 on his large map being misleading), and

during this period covered some 9000 miles, of which all beyond Trieste, 7000 miles, was on horseback. This slow rate of travel was caused by sickness, rains, detention by authorities, and other unavoidable delays; but it enabled the author to make copious notes on the countries through which he passed, and when it is remembered that there is even now very great difficulty in traversing a considerable part of his route, it becomes a subject both of wonder and congratulation that he succeeded during such troubled times in passing unharmed through disturbed districts. He was accompanied by a fellow-traveller as far as Hamadan in Persia, but from that point continued his journey alone.

The more interesting part of his account commences after leaving Trieste, as he then rode along the Dalmatian coast, crossing Montenegro and Albania, and reaching Constantinople by Lake Ochrida, Philippopolis, and Adrianople. Asia Minor was traversed from north-west to south-east, *viâ* Ak-Sher, and the coast struck opposite Cyprus and followed to Antioch, whence the author visited Aleppo and journeyed south to Tripoli to Jerusalem and Bethlehem, returning by Damascus. Continuing his eastern route, Mr. Mitford reached the Tigris *viâ* Mardin, following the river down to Bagdad and then striking north-east to Teheran. Continuing through Persia by Shahrud and Mash-had, he reached Herat and Kandahar, arriving at Sakkar on the Indus *viâ* Quetta and the Bolan Pass, and following the river to Karachi; from Bombay, he crossed the peninsula to Madras, visiting Poonah, Aurungabad, Hyderabad, &c., and finally reached Ceylon after following the eastern coast. A large folding map shows this extended route; and two special separate maps give the details (with distances) from Mash-had to Herat, and from Herat to Kandahar, on the scale of 1 : 2,400,000, or 38 miles to the inch. Among the illustrations, mostly of rough execution, are also views of Herat, Kandahar, and the ruins of old Kandahar.

Apart from the extreme personal interest of the narrative of such a journey, Mr. Mitford's book acquires a special value from its dealing in many places with names and events now of historical importance, especially in connection with Afghanistan. His own tastes have evidently led him to notice archaeological and architectural subjects with particular care, but he does not omit to record topographical details, evidences of political feeling, national customs, and sometimes prominent natural history objects.

Müller, David Heinrich.—*Al-Hamdâni's Geographie der Arabischen Halbinsel, nach den Handschriften von Berlin, Constantinopel, London, Paris, und Strassburg zum ersten Male herausgegeben von David Henrich Müller.* Leiden (E. J. Brill): 1884, 8vo. (*Dulau*: price 12s.)

This work, published under the auspices of the Vienna Imperial Academy of Sciences, is entirely in Arabic. A second volume, with introduction, notes, and indices, is promised shortly.

AFRICA.

Krause, Gottlob Adolf.—*Mittheilungen der Riebeck'schen Niger-Expedition. II. Proben der Sprache von Ghât in der Sâhârâ, mit Haussanischer und Deutscher Uebersetzung.* Leipzig (Brockhaus): 1884, 8vo., pp. iv. and 82, map.

This second contribution to the Linguistic and Ethnographical records of Dr. Emil Riebeck's Niger expedition (see p. 425 for part I.) is devoted to the dialect of the small desert city of Ghât, which differs somewhat from the Tuâreg. A map of the city and its neighbourhood (scale 1 : 40,000) is given from native sources; and in a sketch of its history it is stated that Ghât was annexed to the Turkish Empire in 1874 or 1875.

Lenz, [Dr.] Oskar.—*Timbuktu. Reise durch Marokko, die Sahara, und den Sudan, ausgeführt im Auftrage der Afrikanischen Gesellschaft in Deutschland in 1879 und 1880.* Leipzig (F. A. Brockhaus): 1884, 2 vols. 8vo., pp. xvi. and 430, x. and 408, maps, plates and woodcuts. (*Dulau*: price 24s.)

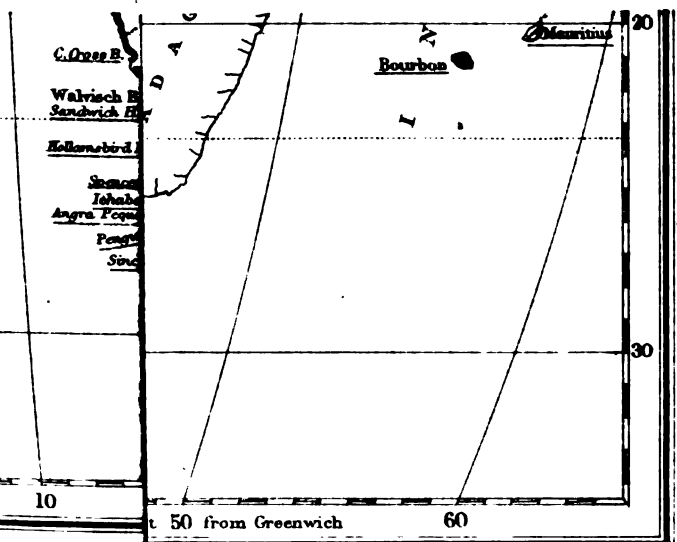
The main features of Dr. Lenz's great journey in North-Western Africa, through Morocco and across the Western Sáhara to Timbuctoo, and then across the Western Sudan by an unexplored track to the Senegal mouth, have from time to time been given in the R. G. S. 'Proceedings' (see especially vol. iii. 1881, pp. 317 and 371); he now gives full details (with many illustrations and excellent maps), which it may be confidently expected will, from the interest of the region and the wide extent of the author's observations, soon be given to the general public in an English form. Independently of his description of modern Timbuctoo, with its 20,000 inhabitants, mosques, libraries, and trade in ostrich feathers, ivory and coral, and of his pointing out that there are other towns of equal, if not greater, importance in the direction of the Sudan,—his various notes on the physical conditions of the region traversed (especially as regards the great Desert) will be found of the most interesting nature. He particularly refers to the prevalent erroneous notions of the Sáhara: finding as he did, elevated plateaux instead of flat plains; a great variety of configuration instead of continuous uniformity; an average temperature of only 86° Fahr., instead of intolerable heat; and many springs, and even running rivers, instead of absolute want of water. In the middle of May, in the central western Sáhara, he records rain and a rainbow. A considerable complex of springs was found in the Areg region; at Bir Tarmanant, three of them were deep and permanent, but the water of the one reputed best was somewhat impregnated with sulphuretted hydrogen. This zone of springs apparently begins with the depression commencing at Wady Sus (not the valley of that name on the Morocco coast, near Agadir). Referring to the question of a great central depression, on which so much speculation and so little fact have been put forward of late, Dr. Lenz says:—"A very considerable portion of the Western Sáhara is usually delineated on maps as El Juf. Such a depression certainly exists, but the lowest level of my route was always about 492 feet above the sea; the depression may possibly increase towards the west, but I do not think the land ever gets lower than 330 feet. The name El Juf is not known to me as applicable to any great part of this region: I only know the Wady El Juf, south of Taudeni, under 21° N. lat." The desert, according to his views, is not an ancient dried-up ocean basin, but a sandstone formation disintegrated by atmospheric influences; and the vast region of shifting sand dunes which it contains offer in themselves a physical obstacle to the formation of any interior sea. The levels given on the author's map vary from 1158 feet at Wady Sus, on the northern side of El Juf, to 836 feet at Arauan, its most southern point by his route. The intermediate heights vary, but were always from 394 feet to 492 feet above the sea, according to a special note at the lowest level reached.

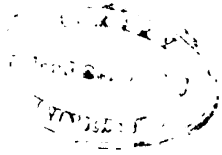
Vol. i. of Dr. Lenz's work is wholly devoted to Morocco, and contains a well illustrated account of the empire, which he traversed from Tangier to Fez, Rabat, the city of Morocco, the Atlas and Anti-Atlas, crossing the Draa to the Igidi desert.

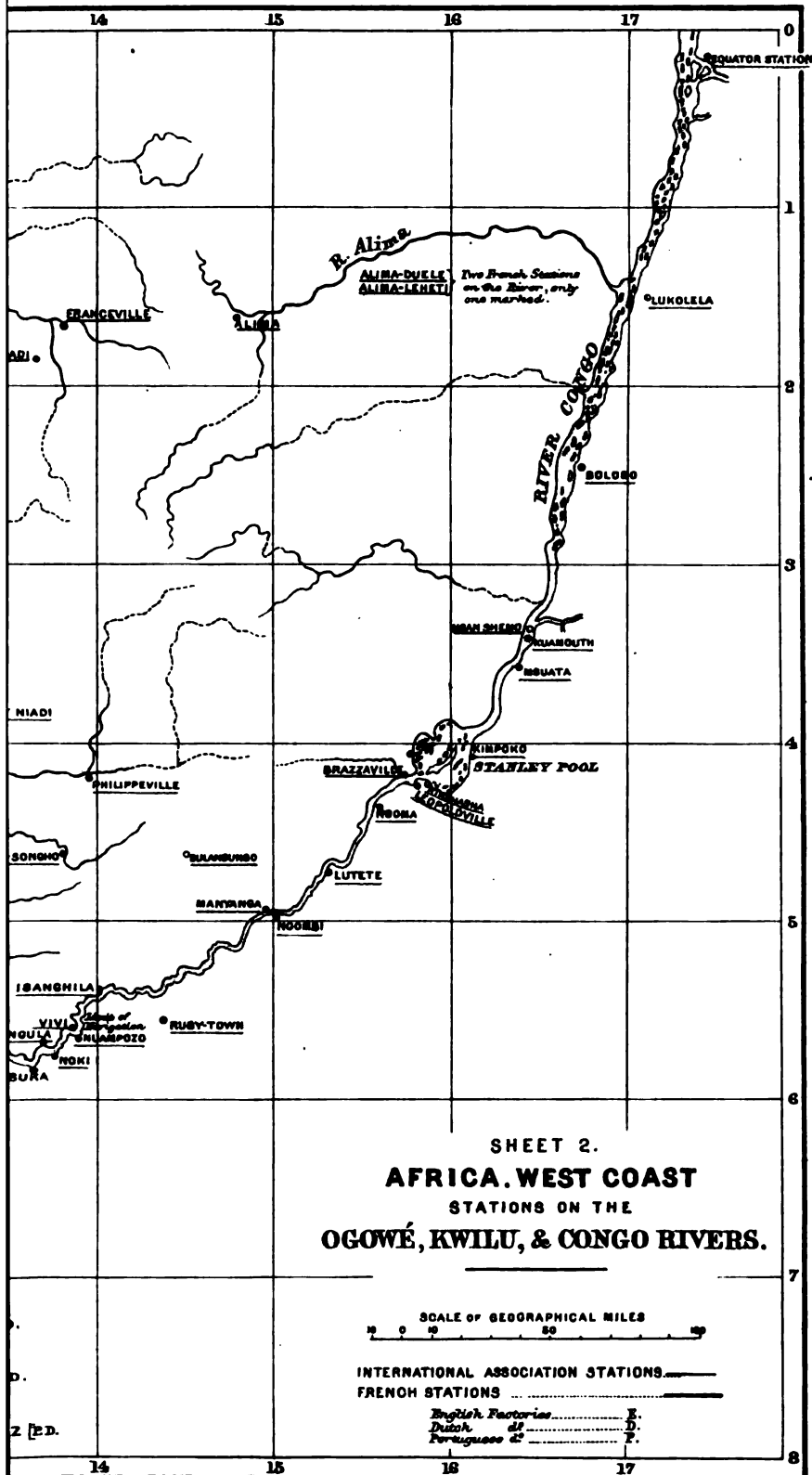
The whole journey is shown on a map of North-west Africa, from Algiers to the Gambia (scale 1 : 10,000,000); the country is also mapped on a larger scale (1 : 1,500,000) in eight sections, 1, from Ceuta to Wady-um-errebba; 2, Wady-um-errebba to Allad Errumla south of Wady Sus; 3, from the latter to Tenduf; 4, from Tenduf to El Eglab; 5, from Bir Mtemnabu Schebia to Wady Teli; 6, from the Wady El Juf to Arauan; 7, from Arauan to Bassikunu (including Timbuctoo); 8, from Bassikunu to Medina on the Senegal. Topographical and geological remarks of general and detailed value accompany the route on these sectional maps.

Williams, [Dr.] Josiah.—Life in the Soudan: Adventures amongst the Tribes, and Travels in Egypt, in 1881 and 1882. London (Remington & Co.): 1884, 8vo., portrait and illustrations. Price 12s. 6d.

The author accompanied the shooting party who visited the Basé country in 1882, and whose experiences are recorded in Mr. F. L. James's book noticed *antea*, p. 54. This account contains much irrelevant matter, and adds nothing to the information on scientific points conveyed in the prior publication,



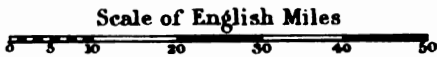






MAP SHOWING THE EXPLORATIONS BY
LIEUT. J.B. LOCKWOOD, INFTRY A.S.O.

1882 - 1883



*The Coast line West of Cape May is
taken from Lieut. Beaumont's Map.*

Preliminary Journey -----

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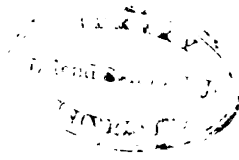
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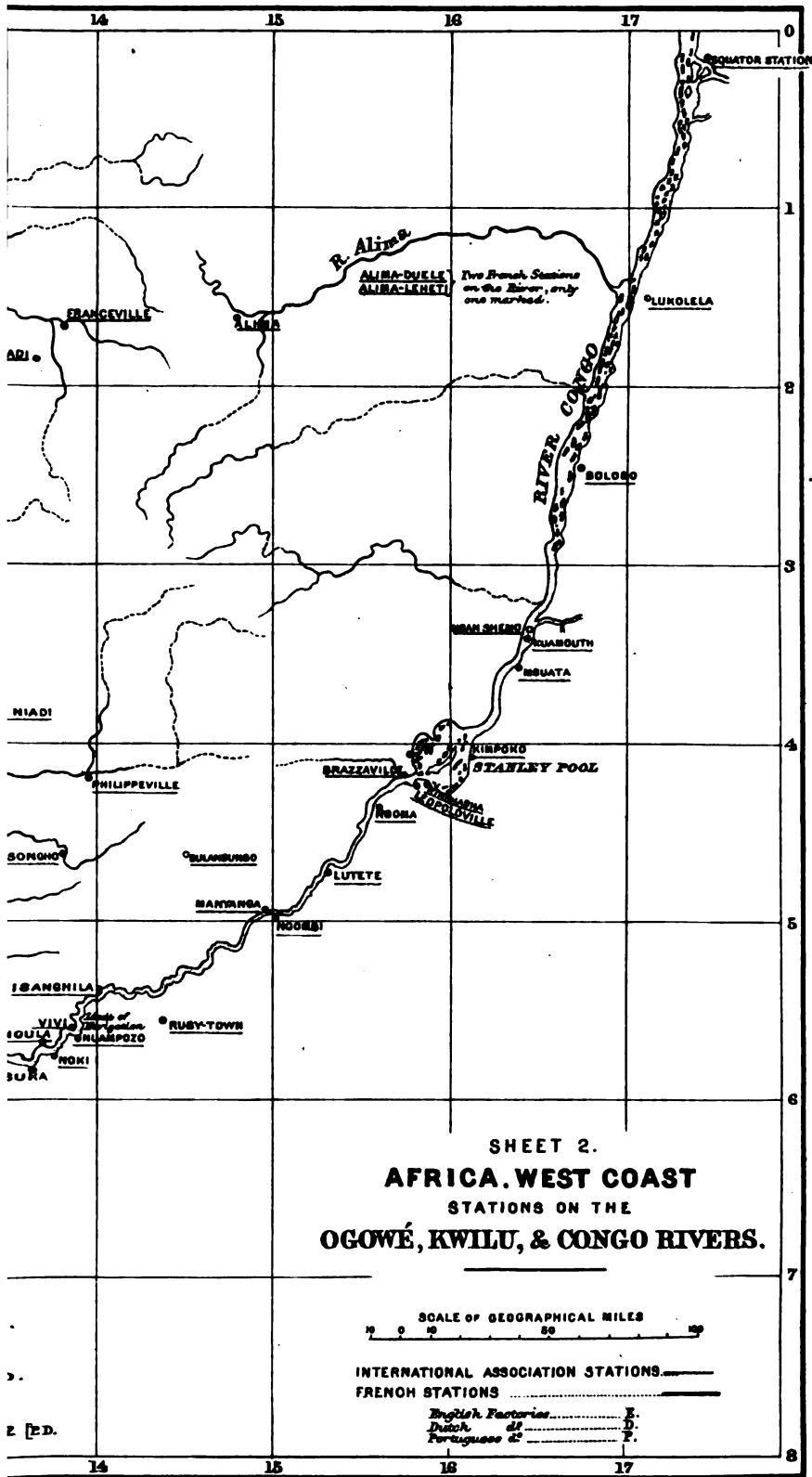
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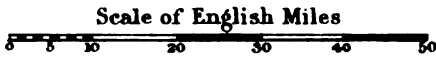




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MAP SHOWING THE EXPLORATIONS BY
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Preliminary Journey -----



PROCEEDINGS
OF THE
ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

Address on the Opening of the Session 1884-5.

By the Right Hon. Lord ABERDARE, President.

(Delivered at the Evening Meeting, November 3rd, 1884.)

I NEED hardly remind you that the annual address of your President is delivered, not at the opening but at the close of the Session; but that it has been his practice on our re-assembling to make brief reference to the principal events of geographical interest which have occurred since our last Meeting. On the present occasion two considerations combine to admonish me that my remarks should be restricted within the shortest possible compass.

One is, that so late as the 28th August our Vice-President, General Sir J. H. Lefroy, presiding over the Geographical Section of the British Association at Montreal, delivered a masterly and comprehensive address, which brought down the chronicle of geographical events to that date, and which has been fully reported in the October number of our 'Proceedings.' I need not say how great was the interest attached to this the first meeting of the Association beyond the British Isles, and you will all share with me the satisfaction I feel at the admirable manner in which our distinguished Vice-President sustained the credit and character of our Society.

The second consideration is that our large gathering this evening attests the interest taken in the address of Mr. Thomson, whose adventures we have followed with keen, often with painful interest, and whose safe return, after travels so perilous and important, is a subject of joy and congratulation far beyond the limits of this Society. I feel how inexpedient it would be to interpose myself one moment longer than is necessary between Mr. Thomson and his audience.

At the meeting of the Geographical Section at Montreal many papers read were of unusual merit and interest. But its chief attraction was the presence of Lieutenant Greely, and the paper read by him on the three years' work of the American Polar Expedition in Lady Franklin

Bay. In my Anniversary Address in May last I recorded the recent departure of the admirably equipped expedition sent by the American Government in search of Lieutenant Greely and his party, and I expressed the belief that, although three years had elapsed since they had been heard of, their rescue was far from hopeless. This belief has been partly justified. The Relief expedition returned in July with the six survivors of the gallant party of twenty-five. Among these fortunately was Lieutenant Greely himself who, with a prompt courtesy which I desire gratefully to acknowledge, has sent us from Washington advance copies of the official maps of the expedition which appeared in the November number of our 'Proceedings,' in illustration of his paper. I will only add that the expedition has, besides other discoveries, added largely to our knowledge of the configuration of the northern coasts of Greenland, during the exploration of which a point appears to have been reached four or five miles nearer to the North Pole than the highest hitherto attained, during what Lieutenant Greely has justly called "the wonderful journey" of Captain Markham in 1876.

During our vacation Mr. Stanley has returned to Europe from the Congo. On the geographical results of his mission he had promised to read a paper during this month; and although we fear he will be unable to fulfil that promise, we have reason to hope that the pleasure of meeting and hearing this energetic traveller is only deferred for a short season. The additions to our geographical knowledge of the Congo, its basin and affluents, made by Mr. Stanley during the last four years have been of great importance; but only fragmentary information respecting them has yet been published. They include his ascent of the Quango tributary and its branch the Wabuma, together with the discovery of a large lake; and also his voyage up the Aruwimi, a northern tributary of great geographical interest in connection with the still unsolved problem of the course of the great African river the Welle.

The return of Herr Flegel has been followed by an account of his recent travels and discoveries in the basin of the Niger, at a meeting of the Berlin Geographical Society on the 4th October. He had explored during the past two years the whole region of Adamawa, and claims to have discovered the sources of the Niger's mightiest tributary, the Binué; but his efforts, in performance of the mission he had received from the German African Society, to cross the unknown tract between that river and the Congo had, in consequence of the turbulence and opposition of the native tribes, ended in failure.

In my Anniversary Address I referred to the rapid increase in the number of Geographical Societies. To these two very important additions have since been made under the most promising conditions. I refer to the Societies founded at Manchester at a public meeting on the 10th October, and at Edinburgh on the 28th October. I am sure that I am representing your feelings in expressing our cordial hope that

the Societies established in such centres of intellectual and commercial activity will have a useful and brilliant career. I have watched also with great interest the attempt made to found a Society of Commercial Geography in the City of London; and trust that it may be attended with the success which so useful an object deserves.

I have also to refer with satisfaction and hope to the first steps taken by Mr. Keltie in prosecution of the inquiry instituted by this Society into the methods pursued in the teaching of geography in the schools and universities of foreign countries.

I now come to the hero of our present meeting, Mr. Joseph Thomson, who appears among us to give an account of the important expedition with which he was intrusted by our Society.

The part of Africa which he has recently explored has been known, from the commencement of the modern era of African exploration, to be the one involving most danger and difficulty to a European traveller. The first attempts were made only thirty-five years ago by the missionaries Rebmann and Krapf, one of whom discovered Kilimanjaro, while the other believed that he got a glimpse of the second-highest snow-capped mountain, Kenia. The wide tract of country between these mountains and the Lake Victoria Nyanza had never been trodden by a European, until Dr. Fischer's expedition in 1883, whose furthest point has been far surpassed by Mr. Thomson. Mr. Thomson has visited both these mountains, and photographed them. He has discovered extinct volcanoes in a region of high plateaux with a central depression lying north and south, along one side of which stretches a lofty range of hills rising from 12,000 to 14,000 feet. In effecting these discoveries he has marched about 3000 miles, 1200 of which were over wholly new countries. He has been brought into contact with tribes, often rapacious and ferocious, yet presenting many features curious and singular, and new among the peoples of Africa. African travel is at best a severe school of fortitude and patience; calling into constant exercise the endurance of a Stoic, the self-command of a Red Indian, the meekness of a saint, and the constitution of a camel; but I doubt whether any traveller has had in the same period of time such frequent occasion for the exercise of all these virtues and gifts as Mr. Thomson in his experience of the Masai and their wild, rugged and romantic country. He has had his hair-breadth escapes from wild men, wild beasts, and many forms of deadly disease. "In my traveller's history" you will hear

"Of antres vast and deserts idle,
Rough quarries, rocks, and hills whose heads touch heaven;"

and if he cannot touch your hearts, as Othello did Desdemona's, by telling

"Of the cannibals which each other eat,
The anthropophagi, and men whose heads
Do grow beneath their shoulders,"

and of other monsters with which our credulous fathers peopled Africa, you will not the less "seriously incline" to hear his modest, unvarnished tale of adventures among lands as strange as any visited by the knights of old romance, and of dangers encountered and overcome by a spirit not less heroic than theirs.

Through the Masai Country to Victoria Nyanza.

By JOSEPH THOMSON.

(Read at the Evening Meeting, November 3rd, 1884.)

Map, p. 758.

As leader of your expedition to Mount Kenia and Victoria Nyanza, I appear before you to-night to render an account of my stewardship—a task which gives me unspeakable satisfaction.

It must be clear to you that in the time at my disposal I cannot tell you both how my work was performed and what are the scientific results of it.

I am confident, therefore, I shall best meet your wishes by relegating to my map and appendices the dry scientific details of my work, and confining myself to a general narrative of my journey.

It will be remembered that the Society, finding itself in 1882 in a position to undertake a new exploratory expedition, determined to prosecute the work in that region where East African discovery first took its rise, and yet which has been the last to yield up its geographical secrets—I allude to the area lying directly between the coast and Victoria Nyanza.

My commission instructed me to ascertain if a practicable direct route existed through the Masai country to the Lake, to examine Mount Kenia, and to gather data for constructing as complete a map as possible in a preliminary survey.

For the prosecution of this difficult and important task I left England on the 13th of December, 1882, and early in February of the following year I reached Zanzibar. There I was received and entertained most hospitably by Col. S. B. Miles, who entered heartily into the scheme of the Society, and rendered me very material assistance.

As I have such an extent of country to traverse and so much to tell, I will not detain you by a wearisome recital of our preparations and troubles—matters which are only too well known to all readers of African travel. I shall, therefore, pass over in silence my preliminary trip of inquiry to the coast, my difficulties in raising a caravan at Zanzibar, the hard work of selecting goods and the thousand items which the traveller requires; although, had time permitted, I should have liked to detail to you the hearty manner in which the C. M. S.

missionaries at Mombasa co-operated with me in my work of preparation. Suffice it to say that six weeks after my arrival at Zanzibar I found myself at Rabai, to the west of Mombasa, ready for the road.

My caravan consisted of 140 men all told, headed by James Martin, a Maltese sailor, Muinyi Sera, Stanley's former headman, and my old servant Makatubu. My headmen were splendid fellows; my ten askari or soldiers all faithful men and true. But the rank and file of 120 porters can only be described as the very offscourings of Zanzibar villany. They formed one of the most disreputable caravans that ever left the coast, though I am happy to say that after a world of trouble and annoyance I brought them back to Zanzibar improved physically and morally beyond all recognition.

It was, then, with this miserable crew that I was called upon to undertake one of the most hazardous expeditions that I make bold to say has been undertaken for many years in Africa. As I looked at them and thought what was before me, I could not but think of Stanley's significant advice to me before leaving England: "Take a thousand men or make your will!" That reminiscence, however, only came in as a piquant refrain to the song of buoyant hopes which tingled in my heart as I gave the signal to start on the 15th of March. There was a wild rush and scramble for the head of the caravan, with the customary incentive shouts to hurry up and a running fire of farewells as, headed by our flag, the long file of porters passed through the Mission village with its cocoa-crowned heights, its verdant ridges and outer cultivated slopes, and away into the "Nyika" or wilderness beyond.

Seeing that the country and people as far as Kilimanjaro have been so frequently and admirably described by the various travellers who have reached that place, I shall not linger to give you details concerning this part of our journey.

On passing the Rabai Hills the route trends away generally W.N.W. over the undulating country of Duruma, with its dense covering of bush and tangle alternating with thorny scrub, in which are here and there to be found settlements of miserable natives waging war with nature and eking out a meagre existence, ever face to face with famine or flying from the dreaded spear of the Masai.

On the third day we leave all trace of inhabitants behind; and by the fifth day the undulations have disappeared; the bush is replaced by a weird and ghastly assemblage of thorns and gnarled trees; the soil changes from a dark or grey loam to a glaring sterile red sand coincidentally with a change from sandstone to schists and gneiss. Not a drop of water is to be found, except in small holes filled by previous rains, and characterised by a "body" and a "bouquet" which require all the pangs of thirst to make us drink.

This is the true "wilderness." It consists of a great uninhabited plain surrounding the mountains of Teita, and it extends from Usambara

and Paré in the south to Ukambani and the Galla country in the north, and from Duruma on the east to Kilimanjaro on the west.

On the sixth march from Rabai we reach the borders of Teita, and exchange the monotonous wilderness for picturesque isolated mountains with their cool breezes and sparkling rills. These mountains, as they tower up in the surrounding waste to heights varying from 3000 to 7000 feet, may be described as an archipelago of precipitous islands rising from a muddy sea.

An ascent of Ndara which proved to be 5050 feet high, a visit to Mr. Wray who holds the outpost of the Mission army in this field, and a narrow escape from a fight with the Wa-teita, agreeably diversified a two days' stay while the men recruited.

We then crossed to the more picturesque and lofty range of Bura. Here again a fight was with difficulty prevented, and an attempt to stampede the men during the night was only warded off by a timely discovery. From Bura two heavy forced marches took us over the remaining bit of desert, and on the 1st of April we had the satisfaction of successfully completing our first stage by a sudden transition from the sandy wastes to the leafy labyrinths and delicious shade of Taveta.

This district is one of those ideal bits of tropical forest with which the popular imagination clothes the equatorial regions, but which the toil-worn African traveller so seldom sees. Clothing the banks of the snow-fed Lumi, it presents one of the most glorious masses of vegetation conceivable, while the agency of man has been instrumental in forming charming glades, bosky bowers, and rich plantations. The Lumi, deliciously cool and clear, invites the traveller to try its liquid depths, and spreads fertility throughout the year. The neighbouring snow cap of Kilimanjaro tempers the air, and keeps it "cool, though in the depths it lies of burning Africa."

It may indeed be said to be a veritable Arcadia in respect of its charming scenes, and the natives hardly detract from the poetical picture. True Arcadians they are in their peaceable habits, their hospitality, their manly pleasant way and surprising honesty, the only blot to the picture being their excessive lack of common morality.

The Wa-taveta are a blending of two very distinct races, viz. the original Wa-taveta who belong to the Bantu branch, and the Wa-kwafi or Masai who are allied to the Hamitic tribes of the Nile and North Africa. And here by the way let me inform the student of ethnology that the term M-kwafi is a purely Swahili name for a clan of Masai. There is no more distinction between a so-called M-kwafi and a Masai than there is between a Campbell and a Cameron in the Scottish Highlands. I would therefore have you clearly to understand that when I use the term M-kwafi I simply retain the coast name of one among many septs of Masai (just as a Campbell belongs to one among the many Gaelic clans). The Wa-kwafi who are now found in Taveta are there through

the loss of their cattle in their numerous civil wars, they being thus compelled to break their strong caste prejudices and take to the cultivation of the soil.

To the traders from the coast Taveta is admirably suited as a trading and recruiting centre for caravans going to or returning from the Masai country; and hence it has always been a place of great importance.

On our arrival at this agreeable spot I found I had much to do. Thirty loads of beads had to be strung into certain required lengths, and cloths made up as war dresses for the Masai. This proved to be a very trying business with the band of thieves I had under me. In spite of every precaution, no less than two loads were stolen. Yet we had to treat the scoundrels most tenderly, lest we should cause a general desertion. At that time, as I well know, the great majority were just waiting for an opportunity to decamp. Hence every road had to be guarded night and day; all the guns had to be taken from the men and locked up; the most bloodthirsty orders given to the guards, and stories about Masai war parties judiciously circulated. But for this incessant care I should have got up some morning to find the greater part of my men gone.

This policeman's duty was, however, somewhat compensated by trips through the forest to Lake Jipè, an inspection of the parasitic cones which dot the base of the parent volcano of Kilimanjaro, and a visit to the charming little crater lake of Chala, which now occupies the centre of a volcano fully two and a half miles in diameter. The eruption which originated this lake must have been one of the last paroxysmal efforts of the volcanic forces in this region, extending indeed into historical times as its perfect preservation would suggest—a fact further made certain by a Masai tradition which tells how a Wa-kwafi village once occupied the site and was blown into the air by a terrible convulsion. With a strain of poetry they tell you how you may still hear the lowing of cattle, the barking of dogs, and other characteristic sounds of village life. The view looking across its liquid depths to the great parent cone beyond is one of the most notable in Africa at once for exquisite romantic beauty and stupendous grandeur.

It was during one of my forest strolls that I got my first glimpse of Kilimanjaro. We had been for many days at its base, and yet not a glimpse had rewarded our frequent attempts to view its cloud-enveloped heights. We had almost begun to ask ourselves if after all we were to be doomed to the mere "mental recognition" ascribed to Reibmann. Happily such was not to be our fate, for there stood the "Mount Olympus" of those parts, revealed in all its glory, fitly framed by the neighbouring trees. From the forest-clad pediment of Chaga towered up on the left the grand dome or crater of Kibo with its snowy helmet glancing and scintillating like burnished silver in the rays of the afternoon sun; and beside it on its eastern flank rose in striking contrast the dark rocks and

jagged outlines of the pinnacle or peak of Kimawenzi. I could only stand speechless as I got this glimpse of majestic grandeur and god-like repose, feeling how utterly inadequate were words to describe my feeling. But my opportunity was brief. The veil had only been lifted temporarily, and soon huge cumulus clouds began to tumble and roll along the lower pediment, hiding it from view, though for a time leaving the black peak and the glittering dome projected against the pure azure, hanging apparently in mid heavens and more impressive than ever. At last a veil of stratus mysteriously spread itself out. In a few seconds the whole scene vanished, and I found myself staring blankly at a monotonous expanse of grey, little wondering that the natives of the surrounding desert looked up to this great mountain as the very Holy of holies.

My conversations with traders recently returned from the Masai country gave me for the first time some adequate conception of the difficulties before me. It enabled me to realise as I had not hitherto done that the conditions of travel in this region were very widely different from those of the region further south, and they confirmed my previous belief that my caravan was much too small. I was assured that no one ever dreamed of entering the Masai with less than 300 men, and always more when possible. I learned also that as there were no recognised footpaths, and as watering-places were few and far between, and the population migratory, it would be simply courting defeat to trust to one guide.

The money at my disposal unfortunately would not permit me to enlarge my caravan, but I took an important step in the engagement of Sadi-bin-Ahedi. This gentleman is well known to geographers as Wakefield's informant; but he has also become famous in a less favourable sense as the caravan leader and guide of Baron Von der Decken, and also of the missionary New. He contrived to ruin the hopes of the former and co-operated with the notorious chief Mandara in the plunder of the latter. That I should have engaged a man with such a black record will show you how strongly I felt myself under the necessity of having a second guide and interpreter.

It was the 18th of April before all our preparations were complete. On that date we moved out of our arboreal fortress, and on the following day, after a night of anxiety and incessant watchfulness to prevent desertion, we set our faces towards the Masai country.

Our route lay round the southern and western aspects of Kilimanjaro, skirting the boundary of Chaga. A six hours' march brought us to the Habali stream, and there to my intense dismay I learned that a great Masai party was camped in front of us. What was to be done? To turn back or to go forward seemed equally to involve ruin. But the former course I could not for a moment bring myself to think of; I resolved to stand my chance and to push on. Meantime, however, we must take precautions against surprise. In an hour we surrounded

ourselves with an impenetrable thorn fence, while during the night a strong guard was mounted as much to prevent desertion as in expectation of an attack.

Next day, sending an advance guard ahead, we again set out. We proceeded with every possible precaution, but nothing disturbed our march. It was necessary, however, to leave the pathway and stow ourselves away in the jungle till the Masai should have left. We selected therefore as the most suitable position a place near the residence of the chief Mandara, and there we rested.

Of the interesting events which happened during that enforced pause in our progress I unfortunately cannot enter into details. Suffice it to say that I had an interview with Mandara himself, and was much impressed by his princely bearing and evident intelligence.

To pass the time, I ascended Kilimanjaro to a height of 8777 feet for the purpose of collecting some plants. On my return I heard with relief that the Masai had passed and the road was clear. I had still, however, to settle with mine host, who had no idea of letting me off without a *souvenir* of my visit. Through the treachery of our guide Muhinna we narrowly escaped being plundered, though at that time I was not aware of it. As it was, I was compelled to leave behind a large and varied selection of my personal effects, including my own gun, a complete suit of clothes, an iron box, and numerous other articles. Not at all delighted to introduce the blessings of civilisation in this involuntary manner, I bade adieu to Mandara with a prudent show of much friendliness, though in reality with (I am afraid) most unchristianlike feelings and wishes. Thus relieved of a burden of care as well as a load of very valuable goods, we hurried on more lightly, mentally and physically, and soon forgot our mishaps in the wonderfully beautiful scenery around us.

The numerous mountain torrents from the region of rain and snow have carved the Chaga slopes into a varied scene of hill and dale; here a gallery forest arching over a rushing stream, there a bush-clad ridge; now a beautiful glade, anon a piece of park-like country. To our left the view extends over cultivated fertile slopes from which rise curling columns of smoke. Thence ever ascending higher, the eye scans the dark-green forest region, till, passing the lower pediment, it reaches a barren zone, from which spring cloudward the masses of Kibo and Kimaenzi. To the east a distant view over Taveta and the plain beyond is bounded by the higher peaks of Bura and Kadiaro rising above the horizon like dangerous black rocks. Turning to the south-west, we survey a rich expanse of forest and jungle, dotted every here and there with sugar-loaf volcanic hills or more humpy masses of schists breaking through the lavas and tuffs. The gaze is at last transfixed by a glimpse of the silvery sheet of Lake Jipè, seen past the dark and gloomy range of Ugono. To the south the view extends over the well-watered

depression of the Kalè country to the interesting mountains of Sogonoi. This fine panorama is completed to the west by the magnificent though simple outline of the volcanic cone of Mount Meru, which rises from the surrounding plain like a cyclopean pyramid.

Four marches from Mandara's over this exquisite country, with its surprising number of streams and rivers running south, brought us to the "door" or gateway of the Masai, at a place called Kibonoto, on the west side of Kilimanjaro. This is the district where the trading caravans halt to make their last preparations and collect food for the transit of the Masai country, in which nothing but cattle is to be obtained.

To my great annoyance I here found that in spite of all my efforts I had fallen upon the very route taken by Dr. Fischer, who my inquiries had led me to believe would have taken a different road. That, however, was a small matter compared with the further discovery that a few days before my arrival Fischer had had a fight with the Masai, and that in consequence the whole country was in a state of dangerous excitement. I had now reason to congratulate myself on the fact that there were warriors behind as well as in front of us, my men being thrown into a condition of panic bordering on mutiny.

The problem thus presented was certainly not a pleasant one. How should we be able to get into the country with only 150 men, when Fischer with a combined caravan of four times that number had been compelled to fight? The position was pretty much that of a forlorn hope, but I could see only one course open to me. I must at least make the attempt to pass before I confessed myself beaten.

That attempt was made. We crossed the threshold, traversed a grassy treeless plain, and reached the kraals of the Masai at Ngaré N'Erobi in Sigirari. Our greeting was at first most encouraging. With much cheerfulness they relieved us of the care of nearly ten loads of goods. As the day advanced, however, matters became ominous. The warriors grew boisterous and rude. One man attempted to stab me because I pushed him away, and we had to remain under arms from morn till night.

On the third day our worst fears were realised. We had been deluded and entrapped, and the entire country was up in arms to take revenge on our small party for their failure to annihilate Fischer. I had, moreover, by this time seen only too good reason to entertain the gravest doubts about the good faith of my guides, who at the best were manifestly cowards. It was with bitter feelings of disappointment and chagrin that I had to confess there was no course open to me but retreat. I might, it is true, have gone in for a policy of sensationalism and adventure, but I felt that *that* was not what I was sent out for, and I had not yet lost faith in the Italian proverb which I had adopted as my motto, "He who goes gently goes safe; he who goes safe goes far."

Prompt action was now required. News reached us that we would probably be attacked next day. I therefore resolved to exercise a wise discretion and to anticipate the enemy's approach. The night came on gloomy and dark. Drops of rain fell. With hearty satisfaction we saw that a storm was brewing. The word was passed to pack up—a work performed with eager though silent celerity—and thus our retreat commenced in pitchy darkness. The kraals were passed safely to our unspeakable relief. Without misadventure the rest of the country was traversed, and towards the morning we reached our camp at Kibonoto in the midst of a terrific thunderstorm.

A few days later we re-entered Taveta. There leaving Martin in charge of the caravan, I selected ten of my best men and made a forced journey to Mombasa. This place we reached in six stages, having tramped from 35 to 40 miles a day. In one of our marches we did little short of 70 miles within the twenty-four hours and that without a drop of water or bit of food.

My object in making this visit to the coast was to get a few more men, to replenish my sadly diminished goods, and if possible to replace the traitor Muhinna by another man if one could be got. The latter object I failed to attain, and was compelled to return with the scoundrel, who of course was meanwhile kept in ignorance that I suspected him.

In a not very enviable state of mind, but imbued with Mr. Micawber's notion that "something would turn up," I regained Taveta after another series of swift marches, to find Martin and the caravan safe and in good health. There had been fortunately no desertion, owing to the precaution we had taken to secure the guns—for the men were too much afraid of the Masai to trust themselves to the wilderness unarmed.

To my great joy I found that the much-desired "something" HAD "turned up." There was a large caravan from Pangani about to start in a few days for the interior. I at once put myself in communication with the leader, Jumba Kimameta, who for a consideration agreed to let me accompany him past the first stage. It required, however, a vast amount of diplomacy and "soft sawder" to get round the other traders, who to a man were dead against having any connection with me. The negotiations ended, however, in the very worst of them declaring that rather than see me stopped he would carry me on his own shoulders.

My worst suspicions about Muhinna and Sadi were here confirmed, and it was conclusively proved to my mind that they had systematically done all they could to ruin the expedition, having been probably instigated thereto by the Governor of Mombasa. Their villany was laid bare in time to prevent their success in a renewed attempt at Taveta. Yet so absolutely necessary were they to me, that I studiously concealed my knowledge of all they had done.

With our combined caravans it was now unanimously determined to adopt the route which passes to the east of Kilimanjaro. That road

had been closed for many years owing to the numerous fights which had taken place between the traders and the Masai of Lytokitok. But with such a caravan as ours we felt we should be quite a match for any number of warriors likely to be brought against us.

On the 17th of July we for the second time advanced upon the Masai country. This time, however, we had no misgivings as to the result. Our route lay due north along the eastern aspect of Kilimanjaro through a beautiful reach of pasture-land which here spreads out between the base of the mountain and the Lumi—the tree-lined banks of that stream distinctly marking off the fertile area from the barren waste of the Nyika, and at the same time indicating the line of separation between the volcanic rocks and the metamorphic.

The second march brought us to the Useri stream which along with the Kimangelia tributaries form the head-waters of the Tzavo branch of the Sabaki river. These streams are remarkable for the way in which they well forth at the base of Kilimanjaro. In this respect they differ wholly from the Chaga streams which rise high up on the mountain.

As we proceed north the ground gradually rises till it culminates beyond Kimangelia in a broad flat ridge 5000 feet high. Game here is surprisingly numerous. I had several narrow escapes from rhinoceroses which on various occasions broke through the caravan. One especially charged me furiously, and I only succeeded in stopping its advance with my last cartridge when it was within less than its own length of me. At Kimangelia also an old buffalo bull scattered our caravan, pitched a donkey in the air, nearly killed two men, and was only stopped running further amuck by a bullet of mine which laid it low.

Our march as far as Kimangelia was characterised by numerous vexatious delays, in collecting food from the Wa-chaga, in sending back wounded men to Taveta, and from various other causes. At last the day arrived for once more crossing the Masai frontier, and the most strict precautions had to be adopted to ensure our safety.

Crossing the ridge of which I have spoken, our route trended more to the west. We rounded the mountain and reached the great plain of Ngiri. Here we renewed our acquaintance with the Masai, and from the few elders who visited us we were rejoiced to learn that all the warriors in that region had left on a great war raid. This was indeed good news. It would save us a world of trouble and danger, and it would lessen enormously the demand on our goods.

Ngiri proved to be the dried-up bottom of a great lake which formerly had occupied this region, and doubtless had supplied Kilimanjaro with the water that seems to be such a necessary element in volcanic activity. It lies at a level of 3550, and there are still numerous indications of its former condition in the shape of ponds, marshes and swamps fed by springs—for curiously enough not a single stream descends from Kilimanjaro or rises at its base, along the whole of the north side.

The view from the centre of the Ngiri plain is one of the most weird and impressive spectacles I have ever seen.

Imagine yourselves standing in the centre of a great level plain without a single inequality to relieve the monotony, and not a blade of grass to lighten the barren aspect of the damp muddy sand, which charged with various salts effectually prevents the formation of vegetation. Here and there in the distance, however, are to be detected a few sheets of water surrounded by rings of green grass; while a few straggling trees or scrubby bushes mark the positions of fresh-water springs. Other tracts are seen to be covered with a crust of natron and saltpetre formed by efflorescence or by the evaporation of the water from the springs. These appear to the eye as sheets of pure white snow or lakes of charmingly clear water; and when struck by the rays of the sun they shine with the blinding splendour of that luminary itself.

In spite of the desolate character of the scene, it is not without abundance of wild life. The giraffe, fit habitant of such a waste, is seen browsing among the bushes which surround the distant ponds. The wildebeest frisks and gambols with uncouth movements or slowly wanders in great herds across the natron plains, while the zebra, most beautiful of all animals, paces leisurely in long lines from some distant pasture ground, with waving tail and head low down, doubtless with the feeling of contentment in a sense of repletion. Various other animals enliven the outlook in numbers sufficient to evoke wondering expressions of inquiry as to how they live in this extraordinary desert. In the morning very perfect mirages are to be seen elevating the game phantom-like till they appear to be moving high in the atmosphere, while a marvellously beautiful effect is produced by the heated air rising from the sands giving a curious wavy motion to the black and white stripes of the zebra, reminding one somewhat of the electric advertisements to be seen about railway stations at home.

Through a ghastly haze Kilimanjaro may be discerned abruptly springing cloudward at a very high angle with perfectly even uninhabited slopes. On the W.S.W. stands the pyramidal Mount Meru. On the north-west are the peaks of Ndapduk and the frowning mass of Donyo Erok. To the north are the less imposing hills of Matumbato, and away to the north-east and east are the mountains of Ulu and Kyulu.

It was very fortunate that game was so abundant here, as our food fell short. I had to supply the entire caravan by my rifle, which caused me to run into more dangers than I bargained for, as I was not at all desirous of reaping glory by shooting rhinoceroses.

Four marches across Ngiri, at first west, then north, brought us to the Ngaré Na Lala, at the base of Donyo Erok el Matumbato; and here we exchanged once more the volcanic for the metamorphic area. Here also we first met the Masai in considerable numbers, and our miseries commenced in right earnest.

It is quite impossible to picture to you the wretched life we were now called upon to lead among the most unscrupulous and arrogant savages to be found in all Africa, who indeed look down upon all other tribes as inferior beings. Even with our large caravan we had to submit with the meekness and patience of martyrs to every conceivable indignity. Though they had pulled our noses, we should have been compelled to smile sweetly upon them.

On reaching camp each day our first business was to construct a strong thorn fence with all possible celerity. Inside this the goods were protected by an inner circle, and covered over from prying eyes. Another fence was placed round the tents, and the entrance guarded by several men who with bland manners and soothing words sought to mitigate the horrors of a Masai invasion. In spite of everything, however, they would frequently push the men aside and swagger into the tent, bestowing their odoriferous, greasy, clay-clad persons on my bed or whatever object best suited their ideas of comfort. After formal salutations and assurances (with "asides") of how delighted I was to see them, begging would commence, and string after string of beads would be given them in the hope of hastening their departure. Finally, after exhibiting to their untutored gaze all the marvels of my own white person, they might be cajoled out, leaving behind them most unsavoury tokens of their visit.

Till night no man might lay aside his gun or leave a single object exposed to view, and it was only in large numbers they dared go outside to draw water or collect food. At sunset the Masai would retire, and then a sense of relief would be experienced. The gate was closed, and a night guard appointed. After that guns might be dispensed with, fires lit, and food cooked. As the night crept on, tongues would be loosened and general animation aroused, only now and then broken as a prowling Masai thief would be challenged or a charge of powder fired to frighten him off. The stir of the camp would reach its maximum three hours after sunset, and then gradually die away as the porters, wearied with the work of the day and filled to repletion, sank one by one to rest. Then only the horrible laughing and yelling of hyenas, the roaring of lions, and the cries of jackals or wild dogs were to be heard in the midnight air.

As we have now seen something of the Masai, it may not be out of place to say a few words more immediately descriptive of them. A more remarkable or unique race does not exist on the continent of Africa—indeed I might safely say in the two hemispheres. In their physique, manners and customs, and religious beliefs, they are distinct alike from the true negroes and from the Galla and Somali. They are the most magnificently modelled savages I have seen or even read of. Beautifully proportioned, they are characterised by the smooth and rounded outline of the Apollo type, rarely showing the knotted and brawny muscles of the true athlete.

The women are very decently dressed in bullock's hide. They wear by way of ornament from 20 to 30 lbs. of thick iron wire coiled round the limbs, arms, and neck, beside a great assortment of beads and iron chains. The men wear only a small kid-skin garment round the shoulders and breast, that being of somewhat more ample dimensions among the married men.

The most remarkable distinctions characterise the various epochs in the life-history of the Masai. The boys and girls up to a certain age live with their parents, and feed upon meat, grain, and curdled milk. At the age of twelve with the girls, and from twelve to fourteen years with the boys, they are sent from the married men's kraal to one in which there are only young unmarried men and women. There they live in a very indescribable manner till they are married.

At this stage the men are warriors, and their sole occupation is cattle-lifting abroad and amusing themselves at home. The young women attend to the cattle, build the huts, and perform other necessary household duties. Both sexes are on the strictest diet. Absolutely nothing but meat and milk passes their lips. Spirits and beer, tobacco, or vegetable food are alike eschewed. So peculiar indeed are they in their notions, that they will not even eat the meat of any wild animal. Moreover, the meat and milk are never taken together. For several days the one is their sole diet, to be followed by the other after partaking of a powerful purgative. On killing a bullock they drink the blood raw, which doubtless supplies them with the necessary salts. In eating meat they always retire to the forest in small parties accompanied by a young woman.

So pleasant does the Masai warrior find this life that he seldom marries till he has passed the prime of life and begins to find his strength decline. The great war spear and heavy buffalo-hide shield, the sword and the knobkerry, are then laid aside. For a month he dons the dress of an unmarried woman, and thereafter becomes a staid and respectable member of Masai society. He goes no more to war, but devotes himself to the rearing of a brood of young warriors. His diet changes with his mode of life, and he may indulge in vegetable food, drink beer or spirits, and smoke or chew tobacco. At death, the body is simply thrown out to the hyenas and the vultures.

The habits of this strange tribe are purely nomadic. They move about according to the pastures. Their houses are formed by bent boughs plastered over with dung, hides forming an additional protection in the wet season. Their mode of government, their peculiar religious belief, and their distinctive customs in peace and war, all form interesting and attractive matter, but must be left undescribed at present.

From Donyo Erok our route lay almost due north, through the district of Matumbato, a region resembling the Nyika in its sterile

character, its red soil, and geological formation, but differing from it in its greater abundance of water, broken surface, and numerous inhabitants.

On our fifth march from Donyo Erok we reached a great area of sterile desert which stretches westward to Ngurumani and the Mau Mountains. Our route now skirted the base of the Kaptè plateau, the perpendicular escarpment of which here frowns dark and threatening over the plains. This topographical feature marks the line of a great fault running generally north and south, its geological character being further indicated by numerous volcanic cones which have sprung up along the line.

Five more marches through Masai in great numbers, and we left the plain. Ascending the plateau we reached Ngongo-a-Bagas at an elevation of 6150 feet. It is here and in the immediate neighbourhood that the Athi river of Ukambani takes its rise, forming the southern boundary of Kikuyu.

At this delightful spot we spent a fortnight, recruiting our men, and laying in a supply of grain which was brought in extraordinary quantities by the intractable Wa-kikuyu.

Our purchases completed, we resumed our march laden with a month's provisions, while the traders had more than double that quantity.

The first camp from Ngongo we passed through a night of adventures, resulting in the death of two Pangani porters and several Wa-kikuyu who surrounded us in thousands. The night was stormy, and we were in a dense forest without our usual thorn fence, so that it was a marvel we escaped with so little loss. In the morning a large capture of Wa-kikuyu was effected, and it was with difficulty I saved them from having their throats cut by the enraged traders.

The next march was a long one without water, and ended in a still more marvellous scene of disorder and panic. Men fell down exhausted. Lions attacked the donkeys, killing several. The donkeys fled braying, kicking off their loads, and in the darkness many were shot down as lions. Men threw down their loads and fled for camp or spent the night up trees. Lions roaring, donkeys braying, guns firing, shouts and cries of panic-stricken porters and excited masters, produced an effect such as I shall never forget, while fear-maddened cattle broke away from all control and crashed through the bush. Ably seconded as I was by Martin and my headmen, I succeeded in keeping my porters together, and got everybody and everything safe into camp. One half of the Pangani caravan, however, under the belief that the Masai or the Wa-kikuyu had attacked those in front, dared not advance, but huddled together like a flock of sheep, seeing lions in every waving bush and Wa-kikuyu in every stump. To hunt up lost donkeys and cattle, collect loads thrown away, and otherwise repair the disasters of that night, required a halt of three days; and even then we departed with a serious loss.

On leaving G. Kidong where we had stopped, we reached the base of a remarkable extinct volcanic crater named Donyo Longonot or Suswa.

It rises 3000 feet above the surrounding plain to a height of 9000 feet in the shape of a truncated cone, the centre of which forms a great circular pit about two miles in diameter and many hundreds of feet deep. So sharp is the rim that I actually sat astride of it, with one leg, dangling into the abyss below and the other down the steep face of the mountain.

The view from this extraordinary crater is one of the most varied and imposing imaginable. To the south, from the great desert plain rises another larger but less regular crater called Donyo La Nyuki. On the east, tower the frowning mountains of Kaptè, over which may be seen the higher peaks of that magnificent range of mountains known to geographers as Settima. To the north lies Lake Naivasha with its pretty isles bounded to the west by the great escarpment of Maũ—the counterpart of the Kaptè plateau.

From this place a single march brought us to the south end of Lake Naivasha; and the next morning we camped at the north end. Here I found that for a second time I had fallen upon Dr. Fischer's route, only to learn, however, that he had been compelled to turn at this point.

Naivasha is a comparatively shallow fresh-water lake, forming an irregular square 12 miles long by 9 broad, lying at an elevation of 6000 feet. It has been formed by the piling up of volcanic débris across the narrow trough lying between Maũ and Kaptè, damming back the waters of the Murundat and Guaso Giligili. Around the lake we find everywhere evidences of a comparatively recent period of volcanic activity, in cones and craters, the steaming mountain of Buru, faults producing angular outlines (a peculiarity not generally found in districts modelled by surface agents), besides numerous hot springs and steaming rents.

Time will not permit me to tell you how we literally bored our way past the Masai of Naivasha after a ten days' plundering. Suffice it to say that we did surmount all difficulties. I here made up my mind to attempt a dangerous enterprise, namely, to visit the district of Lykipia and Mount Kenia. This seemed to offer the only chance of my seeing that hitherto unseen snow-clad peak, and I consequently turned a deaf ear to the remonstrances of the traders and to the abject entreaties of my cowardly guides Sadi and Muhinna.

My plans were soon matured. Remembering my experience in Urua in my first expedition, I determined to take as small a number as possible, and rely more upon my character as a medicine-man than on men and guns. We foresaw a possible flight, and in consequence took only what was absolutely indispensable. With a select party of thirty men, I set out on my hazardous trip on the 6th of October, leaving Martin to go on to Baringo with my good friend Jumba Kimameta.

Passing out of the meridional trough, with its string of charming lakes, we ascended 8400 feet, to find ourselves once more on the plateau here called Lykipia, and occupied by great numbers of Wa-kwafi. We

now entered a splendid forest of coniferous trees, forming a landscape more suggestive of the heart of Europe than of Equatorial regions.

On the following morning I had the satisfaction of finding myself enveloped in a dense, raw Scotch mist, and the thermometer at the freezing point. My men, however, presented a miserable sight, cringing half dead over enormous fires, and we were compelled to remain in camp till the sun had driven off the mist and warmed up the air. We then continued our way, crossing a beautiful rolling country with grassy hollows and forest-clad ridges, and shortly after reached the Masai (or that clan of the tribe known as Wa-kwafi).

A trial of meekness and patience now commenced such as I hope I shall never again be called upon to endure. Indeed, it would have been absolutely impossible to proceed another step but for the reputation I obtained as a great Lybon or medicine-man. You will perhaps form some idea of what we had to put up with from the fact that a trip which should have occupied little more than ten days extended over a whole month. To detail our trials and troubles would but weary your patience, and I will therefore pass them over in silence. Suffice it to say that we had our reward in traversing one of the most interesting tracts of country to be found in the Equatorial regions.

Our route led us among conifers, heaths, and Cape calodendrons, across hills and treeless plains with streams and rills in endless numbers flowing into the mysterious Guaso Nyiro. We visited a beautiful waterfall on the Urūrū or N'Erok, and crossed a magnificent range of mountains. As this range had no name I have taken the liberty to give it that of our respected President. The Aberdare Mountains extend from north to south, and rise to a height of little short of 14,000 feet. Finally, with goods exhausted, and driven almost mad with days of worry and nights of incessant watchfulness, we triumphantly found ourselves standing at the base of Kenia, looking up at its grand proportions but simple outline, quite satisfied that we had not endured in vain.

Kenia rises as a great volcanic cone, nearly 30 miles in diameter at its base, from a thorn-clad plain 5700 feet in altitude. Up to a height of 15,000 feet the angle is very low and the slope is unbroken comparatively by ridge or glen. From that level the mountain suddenly springs into a sugar-loaf peak—the resemblance to a sugar-loaf being made all the more striking by the glittering facets of snow which characterise the uppermost 3000 feet.

The sides of the peak are so steep that the snow cannot lie on many places, the unclad parts showing through the white, as black spots. Hence its Masai name of Donyo Egaré (the speckled or grey mountain).

Unfortunately we were not allowed much time to examine this fine sight, which, like Kilimanjaro, is only to be seen, as a rule, in the morning and evening. The Masai were in great numbers. My goods were finished, and as I had no better stock in hand than a couple of

artificial teeth and some Eno's fruit salt to keep up my reputation as the Wizard of the North, my position became doubly dangerous.

Then, what was even worse, we were subsisting upon the most atrocious food imaginable. A strange disease had attacked the Masai cattle, and was sweeping them off in myriads. In many districts not a head was left, and our customary mode of travelling was with fingers holding our noses through miles of country covered with decomposing bodies.

The consequence of this was, that the people were dying of hunger. In their despair they made my life miserable, demanding, at the point of the sword, medicines to stay the ravages of the disease. For the most exorbitant prices we were able to buy only bullocks at the point of death. Of these only small portions were at all eatable, the rest being absolutely putrid, and even the bones were like mud. Such was our food in Lykipia. It is true that the country swarmed with buffalo, but then we rarely dared fire our guns or leave the camp to hunt.

Our souls began to revolt against this disgusting diet, while our position was daily becoming more perilous. We were compelled to take French leave at last, and fly in the middle of the night. We had almost to make a run of it, and having no loads, we soon put a considerable distance between ourselves and our persecutors. We had further to take the precaution of not going in single file, so as to hide our track. Fortunately we met with success, and on the second day we could breathe more freely in the uninhabited wilderness.

I found myself, however, in a very curious position. We were marching for Lake Baringo, which was only conjectured to be in a particular direction and at a certain distance. The piquancy and romance of the position, however, were most enjoyable, and we had no misgivings, as there were no Masai in front, while game was numerous and sparkling streams everywhere.

Our route lay W.N.W. through dense forest for the most part, which we traversed by means of the buffalo and elephant tracks, assisted by my compass.

On the sixth day from Kenia we once more reached the edge of the plateau, and were overjoyed to find that we had marched straight for Baringo. There it lay glittering several thousands of feet below! I have now looked upon many wonderful lake and mountain scenes in Africa, but not one approaches the striking spectacle which now spread out before me. From the Lykipia Mountains, at a height of nearly 8000 feet, we look down on the meridional trough which extends from Naivasha. The western side of this trough is formed by the abrupt narrow range of Kamasia. Behind springs up the stern face of Elgeyo, from whose summit shades gently away the treeless "Red Plain" of Guas-Ngishu, while at right angles lie the great mountains of Chib-charagnani. To the north the view is shut in by the serrated outline of

Donyo Silali and the high range of the Suk Mountains. Past these can be descried in the far horizon the isolated masses of Nyiro and the Galla country. Around us, in the more immediate vicinity of the glittering isle-besprinkled lake, rise numerous volcanic hills, a curious assemblage of straight lines, abrupt walls, and sharp angles, all telling their tale of igneous disturbances.

At this place I lost my party, and had to spend the night with two men under very unpleasant circumstances. Fortunately next day I contrived to reach Njemps, and there I found the caravan all safe, though very anxious at my non-appearance. Njemps is a colony of M-kwafi, who have been compelled to take to agriculture and a settled mode of life through the loss of their cattle, and who now live in constant dread of their brethren of Lykipia. Like the Wa-kwafi of Taveta, they have improved enormously in the matter of honesty with their new mode of life, and their district has become an important business centre for the ivory traders.

On arrival I lost no time in making my preparations to continue my journey to Kavirondo. This undertaking seemed only too likely to prove one of the most hazardous. The last three caravans which had entered that region had each lost more than 100 men—these having been killed in the numerous fights that took place—and yet I proposed to penetrate to Lake Victoria Nyanza with only 100 men altogether. Muhinna, who knew it well, was so thoroughly frightened that he feigned extreme illness to avoid going; and so profound was my detestation and distrust of him, that I was only too glad to leave him.

On the 16th of November, leaving all the weak and incapable behind, and taking only such goods as were required, we started. Our course bore almost due west. We first crossed the Kamasia Mountains to the narrow valley beyond, in which a considerable stream flows to Lake Samburu. We then ascended the Elgeyo precipices to a height of 7750 feet, and entered upon the plateau of Guas'Ngishu, which extends in treeless unbroken monotony, bounded by the low hills near Kabarás and the great volcanic mountain of Masawa or Elgon—a counterpart of Kenia without the upper peak. To the N.W. we got a glimpse of a very high mountain, Donyo Lekakisera, described as occasionally streaked with snow. The inhabitants of Kamasia and Elgeyo are a race allied in language and certain customs to the Masai, but they differ from them in the fact that they have settled habitations and subsist chiefly by agriculture. Guas'Ngishu, on the other hand, was formerly occupied by Wa-kwafi. These, however, have been scattered by their brethren of the plains and their cattle swept off. They have in consequence taken refuge in Kavirondo where, too proud to work, they live like paupers and are rapidly spoiling the Wa-kavirondo.

Five weary marches across this shelterless region brought us to the district of Kabarás in Kavirondo; and for the first time since leaving

Taveta we revelled in such luxuries as fowls and eggs, Indian corn, sweet potatoes, ground-nuts and other good things which tasted simply delicious after the fare of the Masai country.

I was agreeably surprised to find that the Wa-kavirondo were a pleasant race, though dangerous when excited or drunk; and I soon proved that the traders must have had themselves to blame if they fought.

Both men and women go about in an almost nude condition, the only apology for a dress being worn by the married women in the shape of a small bunch of cord worn in the fashion of a tail—to which indeed it has a ludicrous resemblance.

Though the unity of this tribe is suggested by the universal similarity of their manners, mode of life, houses, &c., yet it is clearly formed of two distinct races. The people to the north are allied to the Wawahili races, while those further south clearly belong to the Nile tribes—a fact which their language indisputably indicates.

The country itself surrounds the north-east aspect of Victoria Nyanza. It extends to within 40 miles of the Nile and does not reach further than 30 miles south of the Equator. My observations indicate that a considerable part of Kavirondo lies where Victoria Nyanza is placed on our maps.

From Kabaras three marches brought us to the large town of Kwa-Sundu on a fine river named the Nzoia. Finding food here in marvellous abundance at ridiculously low prices I camped the men and with a small party proceeded towards the lake. We passed through the most densely populated region I have yet seen in Africa, and after a variety of adventures—such as checkmating attempts to block our way, and to enforce compulsory stoppages—in one of which adventures I had a narrow escape from being speared—I had the supreme satisfaction of drinking the waters of Victoria Nyanza some 45 miles east of its outlet to the Nile. This event happened in the district of Samia on the 10th of December.

Unlike most other African lakes, the Nyanza is not bounded by ranges of mountains. The ground descends gradually to its shores; and peacefully the water laps the muddy and marshy beach, though not unfrequently it is lashed into the furious aspect of a troubled sea.

I would now have pushed on to the Nile, but the good fortune which so far had happily attended my footsteps began to desert me. My stores were exhausted and I was attacked by fever. I did not know what reception I might meet with in the new country beyond. I determined therefore to turn back rather than risk detention or failure.

On my return to Kwa-Sundu I began to recover a little, and then I celebrated Christmas Day—not with the prosaic adjuncts of roast goose and plum-pudding—but with the more delicious inward feast of satis-

faction at the thought that my mission was accomplished and that my face was now homeward.

I adopted a return route through a more northerly district for the purpose of visiting Elgon or Ligonyi. At this splendid mountain, which almost reaches the snow-line, I arrived after a three days' march through the district of Masawa, which had lately been devastated by a coast caravan, in which therefore we had everything to fear from the revengeful feelings of the natives.

The chief feature of Elgon is its artificial caves. These are extraordinary in number and vast in extent. They are cut out of a very compact volcanic agglomerate. They all occupy one particular horizon near the base of the mountain and numbers of them are occupied by whole villages with their cattle. That such was not their original object is shown by the nature of the excavations which extend far away into utter darkness. Their number, and great size, their occupying a certain horizon, and the fact that the present inhabitants have no tradition regarding them lead me to conclude that they have been mines in some very remote period. By whom the mines could have been worked I cannot conjecture, and the subject will remain doubtless for some time to come a problem for the curious.

Though I was burning to make some more careful investigation of these wonderful phenomena, I was compelled perforce to hurry on. No food was to be got and an uninhabited plain lay before us which had to be traversed with no better guide than my compass.

The last day of the year was marked by one of those interesting episodes which enliven African travel and make the life endurable. I had planted six balls in various parts of an old buffalo bull for the purpose of supplying our larder to duly celebrate the day. These had been sufficient to bring him to the ground, and thinking his days ended I went up to secure my prize. A few seconds later I *went up* in a sense I had not anticipated. Caught on the horn of the infuriated brute, I was promptly propelled skyward and turning a graceful somersault in mid air I came down unconcious. The shock of the fall brought me round somewhat, and raising my head slightly, I found myself under the disagreeable gaze of the bull. Seeing me move he was about to give me my quietus, but at this moment fortunately a gun was fired by my faithful servant Brahim. This had the effect of momentarily diverting the enemy's attention, and as he turned round, I staggered a bit aside and simultaneously we dropped, the bull dead, and I fainting from loss of blood. In the evening I recovered sufficiently to celebrate in buffalo soup the end of the year, and my providential escape from untimely closing my career. Next day I enjoyed the unwonted luxury of being carried on a stretcher, where I could amuse myself with the jocularities of my carriers, who in allusion to their wages named me "their dollars," and incited each other to hurry up and not leave their dollars behind in the wilderness.

Skirting the base of the high range of Chiboharagnani we soon reached Elgeyo, recrossed Kamasia, and once more entered Njemps.

It was quite a month before I was able properly to walk again. But as soon as I could effectively use my limbs, I started off for a fortnight's trip to examine the country round Baringo, and if possible, to shoot an elephant. I was successful in both objects and returned loaded with hunting trophies and happy in the possession of new geographical material.

My luck, however, in the matter of good health had now fled. I had just recovered from fever to be nearly killed by a buffalo; and I had only got over the effects of that adventure to fall a prey to the fell disease dysentery.

As the first symptoms appeared in me we had just commenced the hazardous task of repassing the Masai country. Our route lay direct to Naivasha by way of the long narrow trough which connects Baringo with that lake and includes in the space between the two salt lakes of Nakuro and Elmeteita. On the first day I was able to walk. On the second and third I had partly to ride. By the fourth I had to ride entirely. After that I completely collapsed and had to be held on the donkey while we pushed on to Naivasha. Further than that I could not proceed, and for two days I lay at death's door. At this time the only European article I had was tea; even our salt was finished weeks before.

A two days' stay pulled me round a little, and as the men were at the starving point we started for the top of the plateau to try and get food from the Wa-kikuyu. In this we were successful. There, however, I suffered a relapse, and for two months I hovered between life and death under circumstances which added tenfold to the horrors of my situation. My sole food was clear soup made from diseased meat supplied by the Masai. I lost all count of the days. Owing to the wet and bitter cold I was compelled to shut myself up in a dark grass hut without fire or light, and I could not drag myself even to the door.

At last, finding myself getting no better, I concluded that as I was bound to die if I remained there, I might as well do so in making an attempt to reach the coast. A hammock was rigged up, and more dead than alive I left the cold bamboo-clad heights of Mianzini and started coastward.

To my agreeable surprise, I began to improve rapidly, and making forced marches we reached Ngongo-a-Bagas. Thence striking westward through the dangerous district of Kaptè, we reached Ulu. We were now among friendly natives, and the wearying worry and dangers were past. I was, however, still unable to stand on my legs; our goods were nearly exhausted, and a famine was devastating the land. It was consequently necessary to push on with all haste. The men, now completely regenerated, worked like heroes. Not a grumble was

heard, not a remonstrance expressed. They tramped on from morn till dewy eve, often in straits for water and frequently on less than half rations. In this manner we crossed the sterile wastes of Kikumbuliu, and performed feats of travel probably never equalled by a caravan of the same size.

On the 26th of May we once more camped at the base of Ndara, and the 2nd day of June found us emerging from the wilderness and greeting our friends at Rabai.

And so ended the labours of your expedition, in course of which I had penetrated through the most dangerous tribes in Africa, traversed a region unequalled in that continent for the interest and magnificent variety of its topographical features, and for the unique peculiarities of its inhabitants. I had done all this without the loss of a single man by violence or the necessity of shooting a single native, and thus I had illustrated (as I am proud to say I had done before) the truth of my motto, "He who goes gently goes safe; he who goes safe goes far."

After the paper,

The Right Rev. BISHOP HANNINGTON wished to pay his tribute of admiration to Mr. Thomson for the wonderful journey that he had performed. He himself had not done much in the way of African travel, having only been to Victoria Nyanza and back by a route that was very well known, but he had seen enough to know how tremendous were the difficulties to be encountered in crossing some of the desert tracts which Mr. Thomson had referred to. The Masai were a terror to the other natives all round the district, and it was marvellous to think that he should have penetrated through the Masai country with so small a caravan and have returned without lifting his hands against the natives, and without losing any of his own men. He himself had passed through some districts where no white man had ever been seen before. The people would look at him with most unfeigned astonishment, and the remark that they generally made was, "He is not very beautiful." He certainly was able to return the compliment. One great chief, Roma, to the south of the Nyanza, said that he would be glad to see him, and he sent two oxen as a present. On his arrival at the village he saw a long procession of twelve medicine men carrying antelopes' horns; behind them came Roma, very nearly seven feet high, and behind him about twelve of his wives, likewise carrying antelopes' horns. They came down close to the tent and then stopped. Roma sent a man to say, "I want you to put a seat for me in the middle of your tent." He then glided into the tent, and the medicine men and wives put the horns around him in a kind of magic circle. Those horns were filled with rancid butter mixed with blood, and to make himself secure against all spells, Roma had anointed himself with castor-oil from head to foot, so that he shone just like a looking-glass. He soon began to ask the Europeans to stop in his country, and in fact the big chiefs were always anxious to be taught, but they would be sure to extort loads of beads out of the traveller.

Mr. F. W. W. HAYDON added his testimony to the accuracy of the descriptions which Mr. Thomson had given. His own experience had been obtained when serving on the west coast of Africa in the old slave-trading days, and had to make treaties with the native kings.

Commander V. L. CAMERON said that Mr. Thomson's journey had done more for the geography of Equatorial Africa than any other expedition since Stanley's descent

of the Congo. He wished to offer Mr. Thomson, therefore, his hearty congratulations on the success he had achieved. The whole of the Masai country had previously been almost a *terra incognita*, and it was curious to notice that the idea with which the Germans were working on the West Coast was corroborated by Mr. Thomson's travels. That idea was that by means of the volcanic chain a healthy route might be found from the Cameroons into the interior. Some people, among whom Captain Burton was one, thought that at one time a great volcanic chain stretched across the continent north of the Victoria Nyanza. The President had alluded to the British Commercial Geographical Society, which now had a great number of members, and he wished to thank his Lordship for the kind words he had spoken about it. It had occasionally been supposed that the British Commercial Geographical Society was in opposition to the Royal Geographical Society, but it would ill become him, who owed his geographical reputation to the latter Society, to do anything against it. His object was to bring the specially commercial aspects of geography before men of business in the City, and as similar societies had been established in Germany, France, and other countries, he thought it would be advantageous to England to have one in London.

Mr. F. GALTON said that the paper afforded some curious additional information with respect to the great depression or trough that runs from north to south over so large a part of the earth's surface, in this meridian, and which begins with the Dead Sea, extends down the Red Sea, and ends at Tanganyika. The rounding off of the north-eastern corner of Victoria Nyanza was a new and acceptable piece of information. Those members of the Society who recollected the time when Speke and Grant came back, would remember the great interest that was then excited by Lake Baringo. Known to Speke only by native rumour, its locality could not be fixed, and it was at last delineated as an ear-like appendage to the north-east of Victoria Nyanza, though it looked unnatural to so indicate it. No map maker had ever succeeded in drawing a map of an untravelled country that looked natural. The account which Mr. Thomson had given of the huge cave dwellings was most extraordinary. They occurred in hard conglomerate rock, very difficult to quarry; they were 30 feet high, and extended far away into the darkness, much further than Mr. Thomson had time to penetrate. The caverns were supported by columns, and must have been hewn out by some race long since extinct, and who apparently had left no further tokens of their work and existence. What these caves would reveal when examined by artificial light, and what scorings there were on the rocks, were subjects for some future explorer. Perhaps to the general reader one of the most curious parts of the paper was the description it gave of the great beauty of much of the country. Africa as a whole was not a picturesque country, but the sides of Kilimanjaro and Kenia seemed to afford many scenes of great artistic interest; and the favourable impression which Mr. Thomson had brought back was abundantly confirmed by Mr. Johnston, who was at present on the slopes of Kilimanjaro making sketches of the scenery. It had been his (Mr. Galton's) good fortune to listen to many most interesting papers read before the Society, but he had never heard one that was more full of charm and more instructive than that which Mr. Thomson had just read.

Mr. RAVENSTEIN said that Mr. Thomson's explorations were a great addition to our knowledge of Equatorial Africa, and no other expedition ever sent out by the Society had brought back a larger amount of new and most important information at so small an expense. Several travellers, such as Baron Von der Decken and Thornton, had come into contact with the Masai, but Mr. Thomson had gone right across the country. The Gallas were, according to some, very bad, immoral, cruel, and barbarous, but even among the Gallas the Masai had a bad reputation, and no greater insult could

be offered to a Galla than to ask him if he was like a Masai. Mr. Thomson had not only verified the position of Kenia and given it a definite place on the maps, but he had made careful observations of latitude and longitude, and thereby enabled a delineation to be made of the Masai country with its volcanoes, its old lake basins, and that curious lake Baringo. He had not, however, told them whether Baringo drained into any other lake.

Mr. THOMSON said it was quite an inland basin nearly 3000 feet above the sea-level, and not salt.

The PRESIDENT said the evening's proceedings must create increased confidence in the President and Council of the Royal Geographical Society. Rather more than 3000*l.* had been laid out on Mr. Thomson's expedition, and he thought the Fellows would approve of the action of the Council in so doing and especially of their choice of the agent to carry out their views. Of course they would hardly have entrusted the conduct of so important and costly an expedition to a man who was utterly inexperienced, but Mr. Thomson in his expedition to the other side of Lake Tanganyika proved that he was admirably fitted for encountering the tremendous dangers which it was known he would meet with in the Masai country. The Masai were to all that region very much like the Huns and Vandals at the beginning of the Christian era to Europe; they ravaged the country from the shores of Victoria Nyanza to the Indian Ocean, and to have travelled among such a people under such difficulties and to have escaped without having recourse to violence argued that Mr. Thomson was a man of undaunted courage, of extraordinary resources, and that he possessed all the qualities necessary for African travel. Of course the paper only gave an account of a very small part of Mr. Thomson's adventures, and related but little of the scientific results of his expedition, but Sir Joseph Hooker was of opinion that the botanical collections which Mr. Thomson had made were of great scientific importance, showing that some genera and species of Abyssinian trees and representatives of the flora of the Cape of Good Hope here met on the equator. In Mr. Thomson the Society had a man of great courage, enterprisc, and intelligence, and one who in addition possessed the knowledge necessary for the making of a good geographical explorer, and he (the President) wished to congratulate both Mr. Thomson and the Society on the result of an expedition which had been looked forward to with so much interest. No doubt there were still dangers to be encountered in completing the geography of Africa, but probably no expedition remained to be made of equal interest to that which Mr. Thomson had just described, and he was sure that the Fellows of the Society would look forward with the greatest interest to the work which Mr. Thomson was preparing for the press.

The following are the observations which have been supplied by Mr. Thomson for the compilation of his map, in addition to a rough traverse survey, and material collected from native sources:—For latitude: 7 meridian altitudes of ☉, and 40 meridian altitudes of *s; for error of watch: 11 sets of equal altitudes of ☉; for local time: 7 sets of altitudes of ☉, and 4 sets of altitudes of *s; for ☉'s true bearing and error of compass: 2 sets of altitudes of ☉; for longitude: 5 sets lunar distances ☉ and ☾; 5 sets lunar distances ☽ and ♃; 1 set lunar distance ☽ and α Virginis; 3 observations of the eclipse of ♃'s first satellite; for difference of level: 123 aneroid readings, 37 mercurial barometer readings, 48 hypsometric observations. All the altitudes were observed in a George artificial horizon, and the instruments employed in taking the above were:—One 6-inch sextant, 1 half-chronometer watch, 1 telescope of 2½ inch clear aperture, 1 prismatic compass, 1 George mercurial barometer, 1 aneroid, 1 hypsometer.—[JOHN COLES, *Instructor in Practical Astronomy and Surveying, R. G. S.*]

Journey from Mozambique to Lakes Shirwa and Amaramba.

By HENRY E. O'NEILL, H.M. Consul, Mozambique.

Map, p. 758.*

PART II.—EXPLORATION OF THE NORTHERN AND NORTH-EASTERN SHORES OF LAKE SHIRWA, AND DISCOVERY OF THE LAKES AMARAMBA AND CHIÛTA, THE TRUE SOURCES OF THE LUJENDA RIVER.

SOME months before I left Mozambique on my present journey, I had been collecting information respecting the line of route along which I intended to pass, more especially with regard to the eastern and northern shores of Lake Kilwa, or Shirwa, and the supposed connection of this lake with the Lujenda river. My inquiries, made from sources I had no reason to discredit, resulted in my receiving a great deal of information which contradicted in many main particulars that which has been hitherto accepted respecting the northern limit of this lake and the sources of the Lujenda. When sifted, the chief points in which my information differed from that by which we have, up to this, been guided, were the following :

1. Immediately north of Lake Kilwa, it was reported to me, there were two smaller lakes called Amaramba and ChiÛta.
2. The Lujenda river was said not to approach Lake Kilwa, but to commence at the northern extremity of Lake Amaramba, of which it was the outlet.
3. Between lakes Kilwa and ChiÛta there was said to be a distinctly elevated ridge, across which the waters of Lake Kilwa never passed.
4. From information I received a little later, I was also led to

* The map is based upon seven detached topographical sketches, the diary, and the numerous astronomical observations of Mr. O'Neill. Information from other sources has been introduced sparingly. In laying down Mr. O'Neill's route we have adopted the whole of his observed latitudes, that for Namlugu alone excepted. "Namlugu" is probably an error, as an inspection of the inset map, showing Mr. O'Neill's route from Namlugu to Egwoli shows, and the observation was perhaps made at the camp, a couple of miles to the south-east of Egwoli. All longitudes, up to Shalawe, and all those beyond, being the means of lunars and chronometer observations (Mkuburo alone excepted), have been adopted. Najiwe (Nambewe) and Yano, depending upon the chronometer alone, have been shifted five miles to the east, whilst Makanyero, derived from six lunars, has been shifted as much to the westward. The longitude of Nawâruma, derived from no less than 45 sets of lunars, unfortunately reached us too late to be utilised in the compilation of the map. The whole of the route from the coast to the lake had then been plotted and placed in the hands of the engraver. Nawâruma, on our map, however, occupies its true position relatively to the Namuli Peaks. The adoption of the longitude resulting from these lunars would necessitate the rejection of all observations for longitude to the northward and westward of it, and would have completely deranged the topographical features of the country, as they appear upon Mr. O'Neill's own sketches. The 45 sets of lunar observations are, however, reported by Mr. Coles to be perfectly satisfactory and the new position for Nawâruma (lat. 15° 41' 22" S., long. 37° 5' 34" E.) correct. The present map must be considered, therefore, as provisional only.—[E. G. RAVENSTEIN.]

doubt if the lake extended so far to the north as it was usually represented upon our maps.

My informants were chiefly natives of the district of Mungao near Cape Delgado, who had traded up the valley of the Lujenda and in the Kilwa district. They were therefore better able than most to inform me correctly.

I may perhaps as well say at once that a personal exploration of the district has resulted in my being able to confirm, in every particular, the information I have quoted above, and to show that I was truthfully and accurately informed. However, before this second stage of my journey commenced, the above reports only served to whet my curiosity, and I felt a great anxiety to settle the doubts raised by them.

After despatching a mail, *viâ* Blantyre, to England, announcing my arrival at Lake Kilwa from Mozambique, I accordingly left Mkanyea for the north of the lake. At a risk of being considered tedious I shall describe this journey minutely, so that each successive step taken by me to discover the exact relation that exists between Lake Kilwa and its supposed outlet, the Lujenda, may be clearly seen.

Oct. 7th.—Leaving four men at Mkanyea, we started from camp at 6 A.M. for the northern extremity of the lake. At 7.30 crossed the river Mchimasi, a sluggish stream 15 to 20 yards broad, flowing west into the lake. Our path led us parallel to the lake, skirting the broad fringe of mud and swamp that forms its eastern shore. The country to the east, and in the vicinity of the lake, is of a most tame and uninteresting character, almost a dead level, and devoid of any conspicuous feature. It has the appearance of a vast sea of grass and stunted shrub, at this season without even the redeeming feature of freshness. Over this flat a few isolated clumps of trees are scattered, like islands in a sea of grass. At these clumps will almost invariably be found a few huts; for the inhabitants of this shadeless region value their trees. 10.30 A.M. arrived at a low hill, or rather large boulder, 50 to 60 feet high, from which I took a round of bearings by prismatic compass. An hour after leaving this our path began to wind round to the north-west, and at 3.30 we arrived at an encampment called Masabango (meaning "water-holes"), having rounded the north-eastern extremity of the lake. The waters of the lake were not visible from this point; but judging from the commencement of the reeds, I should say the lake shore was from 1 to 1½ mile south of this.

This spot, which forms a regular encampment for parties passing to and fro from Mkanyea, is about 30 to 40 feet above the level of the flat at the head of the lake, and is selected for the purity of the water which filters up through the sand into a few natural wells. The water of the lake appears to be avoided, even by the natives, and I tasted some that was so brackish as to be almost undrinkable. Latitude of Masabango, by meridian altitude of stars north and south, 14° 57' 26" S.

8th.—Left Masabango at noon, and marched $2\frac{1}{2}$ west, a little northerly. Passed the encampment of Kiromoni, and camped about two miles west of water supply, leaving five men to bring up water. Tried the water in some shallow pools in the flat that extends to the south towards the head of the lake, and found it quite undrinkable.

9th.—Guides and carriers commenced to give much trouble, declaring that their journey to Amaramba was beyond their original agreement, and that now I was extending it by going round the head of Lake Kilwa. I was soon able to see that they were combining to break this journey. To-day my head guide presented himself, with some others, and declared that only two days' food was left, adding that there was great scarcity—almost a famine—in the neighbourhood of Lake Amaramba, and at the north-west of Lake Kilwa no food could be obtained except at Kavinga's on Chikala Hill, where our guides from Mkanyea durst not go in consequence of a quarrel between the two chiefs. Although I knew much of this was false, I at once told off six men to return to Mkanyea with a supply of cloth and bring up food. At the same time I warned them we should continue our march in the morning.

10th–13th.—To-day my guides found themselves woefully foiled. Starting at 6 A.M., I walked on ahead of my party, and after four hours and twenty minutes' steady walking arrived on the banks of a small stream, where very fair water was to be obtained. It was amusing to see the pretended indignation of my head guide, who now turned round and laid all these falsehoods at the door of the guides we had obtained at Mkanyea. As a sort of last desperate effort to prevent my getting on, the men carrying food had thrown down their loads and returned to Kiromoni. I am now told that food may be obtained at a village called Nambasi, two or three miles south-west of this. The stream on the banks of which we are encamped is the Mikoko. The inhabitants of this place tell me it flows *into*, not *out of*, Lake Kilwa.

From Masabango to this point, we have walked almost due west along the southern foot of a ridge that I estimate to be 15 to 30 feet above the level of the lake. This ridge is well wooded and has a thick undergrowth of large shrubs and woody creepers, and nowhere does it bear any trace of the waters of the lake reaching even its foot. If, then, what is told me is true, there would appear to be no connection between Lake Kilwa and the Lujenda drainage system.

14th and 15th.—Struck my tent and took up a position on the outskirts of Nambasi village. About $1\frac{1}{2}$ mile W.S.W. of Mikoko I crossed another small stream, the Nkande, said also to flow into the lake, but, like the Mikoko, it was impossible to detect its current, as, in this the last of the dry season, it consisted only of a succession of pools. I have now completed the circuit of the northern extremity of the lake. The northern face of Chikala Hill is distant from this point certainly not more than four miles.

16th.—To-day I crossed the stream Nambasi and walked to within 1 to 1½ mile of Chikala in order to get a round of bearings from a point close to the foot of that hill.

Up to this I have stubbornly refused to credit the assertions made by all the dwellers upon or near to the shores of this lake—as at Chigwadu, Mkanyea, and Nambasi—that Kilwa has no regular outlet to the northward. The evidence on this point has been so varied and the statement that “Lake Shirwa discharges into the Lujenda” has been so often repeated and so generally accepted, that I felt that nothing but a close personal examination of the whole northern shore of the lake, confirmed by the evidence of those who were living on the spot, would be sufficient to contradict it. I can, however, now say with confidence that Lake Kilwa has no regular, constant outlet to the north, and that it does not discharge into the Lujenda river.

Chikala Hill bounds the lake to the west and almost reaches the parallel of the northern extremity of the lake. It turns off then abruptly to the W.N.W. (by compass) and continues in that direction for ten or twelve miles, where it appears to meet another range of hills lying approximately north and south. Its northern face rises precipitously to a height of 2000 to 2500 feet above the plain.

It forms the natural fortress of a chief called Kavinga, who this year has done the excellent service of defeating and turning back the Makwangwara, who were ravaging the country upon a raid southward and had approached dangerously near our Blantyre Mission.

17th.—Started at 6 A.M., our path leading north-easterly and at the back of the ridge that shuts off Lake Kilwa to the northward. 8 A.M. crossed the Mtorandenga swamp, and shortly after the Namiguru river to which it gives rise. Lost our path amidst the number of game tracks and hunting paths, and therefore turned eastward, and made for Nafisi Hill. After four hours' rough walking over a country literally honeycombed by the footmarks of elephant, hippopotamus, and other large game, made in the wet season, we struck the path leading from Masabango to Amaramba. Camped at 2 P.M. by some pools of stagnant, impure water.

18th.—Made an early start and crossed at 7 A.M. the Sangwi river, which has its source in the Inyango Hills and, flowing eastward, enters Chiüta Lake. At 7.45 crossed Nkakugunda river which also rises in the Inyango Hills and flows into Chiüta. At 11 A.M. arrived on the banks of the Lifune, which forms here some curious deep, large pools, beautifully shaded by overhanging trees, and giving deliciously cold, pure water. This river is also a feeder of Chiüta. Rested and started again at 2.30 P.M., camping at 5 P.M. on the river Masimayela (lit. “the river of white water”), the Kumbanga Hills bearing west (by compass) three to four miles.

19th.—Our course to-day led us parallel to the river Msambiti which

connects the lakes Amaramba and Chiūta. The country passed over yesterday and to-day is of a much more interesting character than that bordering Lake Kilwa to the eastward. The hills of Inyango, Kumbanga, and Kipani, which really form a single range, are within a short distance, and the country inclines gradually down to the bed of the river. The banks of the river are fringed with reeds, and swampy; but the country over which we walked was perfectly dry and lightly wooded.

Four hours' walking brought us to the extreme south of Lake Amaramba, and at 1.30 P.M. we camped at the village of Chemina from three to four miles further north, and upon the western shore of the lake.

20th-26th.—From what I have seen and heard since I have been here, I can have no doubt that Lake Amaramba was the lake visited by the Rev. Mr. Johnson in the beginning of 1881, and mistaken by him for the northern extremity of Lake Kilwa. I had been much puzzled by the apparent contradiction between Mr. Johnson's statement that Lake Kilwa discharges into the Lujenda, and my own observations at the head of that lake. In reply also to careful inquiries made at Mkanyea, Mikoko, and Nambasi, I had been everywhere assured that I was the first European who had visited the northern extremity of Lake Kilwa.

All this apparent contradiction now admits of any easy explanation. Upon arrival here I was at once told that an Englishman had visited the lake two years ago from the westward, and the point at which he had reached it was shown me as opposite the village of Chengogwe, $1\frac{1}{2}$ or 2 miles south of Chemina. At this point the breadth of the lake is about 600 to 800 yards, and it was said that he wished to cross it, but that the canoe men refused to carry him across. From what I saw of these gentry, and the exorbitant charges they made for ferrying my party across, I can quite understand that Mr. Johnson, who travelled with only five or six men, and therefore with only a small stock of supplies, may not have been able to agree with them on this head.

In concluding, however, that Mr. Johnson arrived at Lake Amaramba and not at Lake Kilwa, I do not depend merely upon the statements of the inhabitants of the shores of these lakes. A number of other independent circumstances incline me to this belief.

1. Mr. Johnson tells us that looking eastward, "only a few detached rocks are visible." Now looking eastward from the north-west of Lake Kilwa, you see, not "a few detached rocks," but a continuous line of hills lying nearly north and south, which form the eastern limit of the plain of the Shirwa, and which were crossed by me at Chigwadu.

The appearance of the country east of Lake Amaramba is, however, perfectly described in Mr. Johnson's words. The isolated hills Mitumbi, Mero, Mangombo, Chikalulu and Lipembegwe, widely detached from each other, rise out of a level or gently undulating country, and form the only conspicuous features visible.

2. Mr. Johnson tells us nothing of the three separate streams Mikoko, Nkande, and Nambasi, one or two of which he must have crossed or seen, had he reached the north-west of Kilwa.

3. Had Mr. Johnson visited the north of Lake Kilwa he could not fail to have told us of the hill of Chikala and its abrupt termination, as the hill rises there precipitously to a height of 2000 to 2500 feet, and he would have been under the very shadow of it.

4. Mr. Johnson has said that Mangoche Peak was seen by him towering above all others to the north-westward. Now Mangoche is not visible from the north-west shore of Lake Kilwa. I believe it might be seen on a clear day if one ascended Chikala Hill, but this Mr. Johnson did not do, for the simple reason that Chikala was not to be seen from the point on Lake Amaramba which, I am of opinion, was really the point reached by him.

But apart from these considerations, there is really no reason to discredit the statements of the natives of Nambasi and Mikoko that no European had been seen there until my arrival, or of the people of Lake Amaramba, that an Englishman had visited them a couple of years back from the westward.

The northern shore of Lake Kilwa never having been explored and its character being unknown, and it having been so often asserted that the Lujenda has its source in this lake, and, moreover, the latitude at which Mr. Johnson struck Lake Amaramba being only a little to the north of that laid down on our maps as the northern limit of Lake Shirwa, it was most natural that Mr. Johnson should have concluded that Lake Amaramba was the northern termination of Lake Kilwa.

I hope it is unnecessary for me to say that it is in no captious spirit I bring forward these arguments in disproof of the statement that Mr. Johnson visited Lake Shirwa and "traced the source of the Lujenda to that lake." I am sure Mr. Johnson would be the last to accuse me of this, and the first to agree with me that it is necessary to the right solution of an interesting geographical question that such a mistake, as I feel convinced has been made, should be placed in the clearest light.

Lake Amaramba lies fairly regularly N.N.E. and S.S.W. by compass, and extends between the parallels of $14^{\circ} 19' 15''$ S. and $14^{\circ} 32' S.$ Its greatest breadth is from $1\frac{1}{2}$ to 2 miles. There are nine villages and hamlets upon its shores—five upon the eastern, three upon the western, and one at its northern extremity. These are all named after their chiefs, viz. Napūlu, Chemlola, Chekungwa, Chemaunda and Chengogwe, upon the eastern shore; and upon the western shore, Akumbwa, Chemina and Chemataka; and at the northern extremity of the lake, Akamtundu.

Although most of these are Ajawa, I am told those upon the western shore owe allegiance—rather feeble, I suspect—to the powerful chief

Ngambi, situated a little west of this. Those upon the eastern are subject to Napūlu, who is a Maravi chief, and the oldest settler upon the lake. This chief bears the reputation of being a hard fighter. I heard that within the last two years raids for slaves had been made upon him by the people of Mohemela and Maua, and that in both cases he had successfully defeated them.

Both shores of the lake, opposite these villages, are lined with huts built upon piles; but these huts are more storehouses for food and places of refuge in time of war than residences in time of peace. The country on both sides of the lake appears to be well cultivated, and huts neatly erected will be seen scattered thickly over the shambas.

This lake would form a more healthy spot for the residence of a European than the eastern shore of Lake Kilwa, as it is almost completely free from the unhealthy swamps that border the latter lake, and the ground rises at once from its shores.

On the morning of the 25th, at 5.10 A.M., I started to endeavour to reach the north end of the lake, and the Lujenda river. As I saw no chance of extending my journey to the north end of this lake owing to the discontent and obstructive spirit shown by guides and carriers, I have done my best to measure its length, north of the point at which my latitude observations were taken, by dead reckoning. From 5.10 A.M. we walked steadily along a good path that ran parallel to the lake. At 7.50 halted to breakfast. Started again at 8.50, and arrived, at 10 A.M., at the northern extremity of the lake, and upon the banks of the Lujenda river. During the whole of this walk the path was good, and the pace not less than 3.25 geographical miles an hour. Deducting from this .75 for the winding of an African path, we have 9.34 miles in a straight line for the whole distance of 12.45 miles of ground covered during three hours and fifty minutes' march.

The longer axis of the lake is as nearly as possible N.N.E. and S.S.W. by compass. This corrected for variation $15^{\circ} 30' W.$, will give N. $7^{\circ} E.$ as the true direction of its longitudinal axis. Entering the traverse table with 9 miles as distance, and N. $7^{\circ} E.$ as course, we have a difference of latitude of 8.9 miles, which if the excess of .34 be applied will be more correctly computed as 9.2 miles. The latitude of Chemina being $14^{\circ} 28' 4'' S.$ (mean of eight observations), the north extremity of Lake Amaramba and commencement of the Lujenda river may therefore be placed in $14^{\circ} 19' 55'' S.$ lat.

The Lujenda river, at its commencement at the northern extremity of Lake Amaramba, is a narrow swift stream, flowing between stiff perpendicular banks, 12 or 15 feet above the level of its waters, when I crossed the river at the last of the dry season. It was then flowing with a velocity of not less than $2\frac{1}{2}$ or 3 knots, and its average breadth was not more than 10 to 12 yards. This breadth it appeared to preserve as far as the eye could follow it.

In order to assure myself that Lake Amaramba had no other outlet, I crossed the river at a ford close to the lake, where its depth was only four to eight feet, and rounding the northern extremity of the lake, took a round of angles from its eastern shore. From my point of observation the north end of the lake bore W.N.W., and upon that line of bearing its width was from 600 to 800 yards. Unlike the southern end, therefore, it suddenly contracts, and discharges its waters in the swift, narrow stream I have before described. Between one and two miles below the foot of the lake the Lujenda receives the waters of the Mandimba river, which is said to have its source in the hills around Mangancho Peak. A little below that, again, the Lukono river, flowing from the eastward, is said to unite with it. The latter river is reported to pass north of and close to the hill of Mluli.

Shortly after noon we commenced our return, and arrived in camp about 5 p.m., pretty well done up, but thoroughly satisfied with the results of the day's work. My dead reckoning places Lake Amaramba rather to the eastward of Lake Kilwa; but 44 lunars taken on the nights of the 20th, 21st, 22nd, and 24th, may, I hope, fairly correctly fix the longitude of this lake.

Like "misfortune," African travel sometimes "makes strange bed-fellows." I had been observing the greater part of the night of 22nd, and on the afternoon of the next day had lain down to rest. I had not slept for more than an hour, when I was awoken by a curious entwining sensation about the leg. Feeling instinctively that something was wrong, I jumped out in hot haste, shaking off my leg as I did so, a snake rather over three feet long. The reptile had crawled up the legs of my "Paragon" bedstead, and liking the warmth of my blanket had crept into it, and by way of placing itself further at its ease, had entwined itself round my leg. We soon after unearthed it from amongst the goods stored in my tent, and despatched it. Its bite, I was told by the natives, was not deadly, but a limb, if bitten, swelled considerably, and took some time to heal.

26th.—Hired four canoes at a point one mile south of this, where the lake is about 1000 to 1200 yards broad, and crossed my whole party by 7 a.m. Without any further delay we then turned south and left for Chiuta. Our path this day led us over a dry and lightly wooded country. It lay at some distance from, but was apparently parallel to, the river Msambiti, which connects the lakes Amaramba and Chiuta, and glimpses of this stream were obtained at intervals throughout the day. At 3 p.m. we opened out the north extremity of this lake, and an hour after camped on the banks of a small stream, the only evidence met with of drainage from the eastward into the lake. The drainage from the westward into Chiuta is abundant, as a glance at the number of rivers crossed upon the opposite side, when *en route* to Amaramba, will show.

27th-31st.—Chiuta was to me very disappointing. I had formed

an exaggerated idea of its size, being told that it was much broader than Amaramba, and had several islands in it. None of this was actually untrue; but its shores are of the same character as those of Lake Kilwa, and as its waters would recede and advance to a considerable extent, the lake probably presents very different aspects in the wet and dry seasons. Seen as I saw it, at the last of the dry season, it would, I think, more correctly be called a huge swamp, which opens out here and there into large sheets of clear water, forming a succession of small lakes and large ponds, several of which may cover two or three square miles.

Amidst this confusion of swamps and ponds, and islands of tall dense reeds, arise five small hills (of precisely the same formation as Kitongwe and Kisi of Lake Kilwa) which are practically islands, unapproachable except by water, although when seen from a distance and in the dry season, several appeared to be situated upon a dead flat of long reed grass. Whilst encamped further north I tried to get a canoe to cross over to the island abreast of which I was, but failed.

I cannot lay down with certainty the size or form of the southern part of this lake, as I passed some distance to the south-east of it. I could only see, distant from me some four to five miles, an open sheet of water, about three to four miles in length, the direction of which was approximately E.N.E. and W.S.W. (by compass).

Although, as I have said before, Chiüta does not possess the distinctive lake character of Amaramba, I do but follow the custom of the natives in terming it a lake. Kilwa, Chiüta, and Amaramba are, with the natives, all "Nyassas" or "lakes," whilst Tambo, Mtorandenga, and similar swamps are all termed swamps.

31st.—We started to-day for Masabango without a guide, and straying fell into a path which led to Chigwadu. Consequently I lost the opportunity of tracing the south-east shore of Chiüta. When we recovered our right path we were well to the south of the lake; but I could clearly see the large sheet of water which I have mentioned above. Between us and the lake there was a vast flat, the greater part of which would probably be under water after the rains.

We now commenced to cross the ridge that shuts off Lake Kilwa from Chiüta, and which at this point is between two to three miles broad. Again straying, we had a tiresome search, and only reached our former encampment as darkness set in.

Starting the next morning at daylight, a brisk walk of sixteen miles brought us to our old camp on the Mnembo river, where we found our sick recovered, and letters, accompanied by a welcome supply of stores, from the Blantyre Mission.

I cannot conclude without saying a few more words respecting the connection of Lake Kilwa with the Lujenda drainage system. Having carefully examined the whole northern shore of this lake, and inspected

the streams at its north-western extremity, the only point at which any connection is possible; having also passed over the country between that point and the swamp Mtorandenga—the first source from which flow continuously the waters which give rise to the lakes Chiüta and Amaramba; I am personally convinced that the true source of the Lujenda river must be looked for, not in Lake Kilwa, but in the lakes Amaramba and Chiüta, or if we go back still further, in the swamps Mtambo and Mtorandenga and their connecting stream the Namiguru.

I do not wish to be understood to say that Kilwa never connects with this system of drainage, although I was told on the spot that it had not done so within the memory of any one living there at the present day. The difference in levels is so slight, and the country between the Mikoko river and the Mtorandenga swamp so nearly upon the same plane, that, in opposition to what I was told and in confirmation of the previously accepted theory that "Lake Shirwa occasionally overflows into the Lujenda river," I believe very unusually heavy rains and an extraordinary overflow would so inundate the banks of the Mikoko and the adjoining streams the Nkande and Nambasi, as to cause a connection between the waters of Lake Kilwa and the swamps that give rise to the lakes Chiüta and Amaramba.

It seems to me probable that this connection was more frequent in former times than at the present day. Speaking at Nambasi with some old men, long residents of the place, they told me "the waters of Kilwa were not always as they are now," and that formerly the level of the lake was much higher than it is at present. At one time, they said, the broad fringe of swamp and reeds that now skirts the shores of the lake did not exist. All this strengthens the probability that at a former period the overflow of Lake Kilwa to the northward was much more frequent than at the present day. In any case it is incorrect to say that it discharges into the Lujenda river. That it occasionally overflows into the swamps that give birth to the lakes Chiüta and Amaramba is, I am convinced, as far as we can go in confirmation of the statements that have connected Lake Kilwa with the Lujenda river. Assuming, however, this occasional connection to exist, can it in accuracy be said that Lake Kilwa is the true source of the Lujenda? Can it strictly speaking be called its source, when it may be entirely disconnected from it for perhaps many successive years? Is it not more correct to say that the true sources of the Lujenda river are in the lakes Amaramba and Chiüta?

This connection between the lakes Kilwa and Chiüta is, I believe, year by year being more decisively severed, by the action of two opposing forces of drainage from off the north-east face of Chikala Hill and the hills that lie, roughly speaking, parallel to the ridge that shuts off Lake Kilwa to the northward. The same action that has, I think, silted up this ridge in the past, is now continuing its work in a north-

westerly direction, or upon a line of bearing that is nearly at right angles to the drainage from off the northern face of Chikala Hill. The ridge that shuts off Lake Shirwa to the northward lies across the head of the lake with curious and unbroken regularity. To what does it owe its formation? I think its very regularity may be taken as part proof that it has been water-formed.

There appears to me to be a similar formation in process now along the longer axis of the Lake Kilwa, a description of which will, I believe, explain the formation of all.

The general conformation of Lake Kilwa may be described as that of a basin of oblong, or rather of rhomboid, shape, uptilted upon its western or mountainous side. Upon its eastern a broad flat, from 10 to 12 miles in breadth, extends to the feet of some low hills that bound it in that direction. Through this flat the drainage is weak and sluggish, a few streams wend their way through it, with so weak a velocity that when I crossed them their course was only just distinguishable.

Upon the western side, on the other hand, the drainage is strong and active. Innumerable mountain streams, freshets in the rainy season, run off the eastern face of Chikala Hills, which rise abruptly to a height of 2000 to 2500 feet, and extend to the northern extremity of the lake. These streams rush into the lake with a considerable velocity, heavily laden with particles carried off from the mountain sides on which they have their source. Their velocity, together with the shape and direction of Chikala Hills and the absence of any outlet to the lake, either north or south, causes a set of its waters to the eastern shore. Upon approaching the eastern shore this set encounters the ridge that forms the islands Kisi and Kitongwe—the longer axes of both of which lie at right angles to this set—and meets also with the more sluggish opposing force of the drainage from the eastward into the lake.

Checked by these counter forces, the velocity of this current or set is diminished, and the deposit carried by it is cast down at the foot of the islands Kisi and Kitongwe, or upon a line that lies nearly north and south, and is, roughly speaking, equidistant from both shores. It is to this action I think is due the long, low ridges, now merely sandbanks, but which already form small islands, that extend north and south of the islands Kisi and Kitongwe and the line of sandbanks that lie off the eastern shore north of them. Behind the latter, vegetation is, I observed, growing on apace, and their junction with the eastern shore is only a matter of time.

Looking eastward and remembering that the same forces have been in operation for countless ages past, we have, I think, the true explanation of the vast flat that here meets the eye. The whole of this flat bears the appearance of having been at no very remote period—using this expression of time in a geological sense—under water, and I believe it once formed a part of the bed of Lake Kilwa. But the same causes

that are now at work throwing up sandbanks and shallowing the bed of the lake, have gradually and during the lapse of ages caused a silting up of the eastern shore, until it has been raised to its present level above the waters of the lake.

In conversation with a native of Nambasi, an argument was brought forward by him as telling against the reported connection of Lake Kilwa with the Lujenda drainage system, which seems to me worthy of mention. "If," he said, "the waters of Lake Kilwa mingle with those of Chiüta, how is it that there is so great a difference between them? The water of Chiüta is perfectly sweet and drinkable, whilst that of Kilwa is so salt as to be avoided by all who live on the shores of the lake." As I remained some days on the shores of Chiüta, I can answer for the truth of his statement as to the sweetness of its waters.

The western portion of Lake Kilwa is now so shallow, that two or three years ago, during an exceptionally dry season, I was told a man might have walked from Kisi Island to the mainland, and that the natives were only deterred from doing so by the soft muddy character of the bed of the lake and the fear of crocodiles. A servant I despatched with letters to Blantyre assured me the depth between those two points nowhere reached the height of a man.

I cannot but regret that I have been unable—owing to the fact of my arriving at the northern extremity of Lake Kilwa in the last of the dry season—to settle conclusively the question of its outlet. I hope, however, it may be settled soon by some member of the Blantyre Mission, who may visit it during or after the rains.

Before concluding, I must say a few words respecting the advantages the country on the northern shore of Lake Kilwa and further north in the neighbourhood of lakes Amaramba and Chiüta offers to sportsmen as a good game country.

To any true sportsman I feel I can safely recommend it. It is unquestionably the best game country I have passed in East Africa, not excepting the valley of the Kingani river, which is, I think, looked upon as the best shooting country on the mainland in the neighbourhood of Zanzibar. I saw herds of buffalo and antelopes of many different species. Of the latter I saw on several occasions eland, and what I believed to be—judging from its great size and the shape of its antlers—Nyala, both rare sport, I think, now-a-days. Of the smaller kind of antelope I noticed many different species. Troops of zebra also and giraffe I saw on several occasions. A species of wild pig, of which my men shot several and which made very good eating, was very common.

Of elephant I saw none, but the country about the swamps Mtorandenga and Tambo was literally cut up with spoor of large game, such as elephant, rhinoceros, and hippopotamus. To the English sportsman this is a virgin country, and I should say well worthy of a trial.

I am now on my way to the coast by a more southerly route than that by which I came, and if successful I shall be able to lay claim to having opened up two new routes from the Mozambique coast to the Lake district. The route sketched out for me by my guide is one by which I am told I shall cross all the principal rivers between the Mluli or Angoche river and Quillimane.

PART III.—RETURN JOURNEY FROM LAKE SHIRWA TO THE MOZAMBIQUE COAST AT ANGOCHE, NOVEMBER 1883 TO JANUARY 1884.

On the 3rd of November we left Mkanyea for Nangoma, from whence it had been arranged I should strike southward down the Likugu valley, as I was most anxious to learn something about that river.

Four hours' walk brought us again to the village of Chigwadu at the western foot of the Luasi Hills.* In crossing these hills, which are here six to eight miles in breadth, I saw several spots that seemed to me well adapted in every way for the establishment of a mission, should the Mission Committee of the Scotch Established Church be disposed to extend their work to the eastward of Lake Kilwa. One valley in particular, watered by the stream Makomba, and at an altitude of, approximately, 2500-3000 feet above sea-level, appeared to me to be especially suitable. A mission established at such a point would have the advantage of being within easy communicating distance of headquarters at Blantyre, as, provided a good sailing-boat was kept for crossing Lake Kilwa, the journey might without difficulty be accomplished in a couple of days.

I could not recommend the selection of a site nearer to Lake Kilwa than this, not only on account of the extreme unhealthiness of the flats to the east of that lake, but also because both the chiefs Chigwadu and Mkanyea are strongly under the influence of slave dealers. At the village of the former I saw large barracoons that were being filled with slaves, and spoke with some of the dealers, who told me that they were from Kissanga and had been four months located in that district. And amongst the Maravi hamlets I passed through in the Luasi Hills, one was pointed out to me as being peopled entirely by refugees from the district of Mkanyea. There are many hamlets of the Maravi tribe amongst these hills, the people of which I cannot but think would gather round a mission if one were established amongst them. A mission station here might also be the first step towards a second in the healthier and more attractive locality of the Namuli Hills.

From Chigwadu to Nangoma our path led us over the same ground

* I have called these the Luasi Hills for want of a more suitable name. None is given to the range by the natives, and as the river Luasi seems to be the chief river that has its source in them, I have named the hills after it.

as that we before traversed, except that Mrieku Hill was crossed and the circuit before made south of Matakawe avoided. A fine view was gained of Namuli and its fellow peaks in crossing these hills.

Three days were passed at Makanyera in the hope of obtaining lunars to fix the approximate longitude of Matakawe and the Luli (Lusi) river, but only six distances could be obtained on account of the unfavourable weather. On November 10th we took up our old encampment at Nangoma.

At this point I parted from my head guide. He desired to accompany his party to the coast by the route we had before taken. I wished to take a different and more southerly route. His readiness to fall into my views and the ardour with which he set about to procure me guides rather astonished me. I very soon, however, received a reason which explained it all. His headmen had been collecting slaves during our absence, and as I was not exactly the person a slave trader wished to see attached to his caravan, more especially when he was bound for the neighbourhood of Mozambique, he naturally was most desirous that our paths should diverge.

A very short delay was made at Nangoma, and on November 12th we recommenced our journey to the coast. Our first day's march was a long and hard one, leading amongst the hills in almost a due southerly direction. Many villages were passed, most of which are named in the accompanying map; and two affluents of the Likugu, the Namwilasi and Mwitwiwe, crossed before a halting place for the night was reached. This was at the village of a chief called Mwanamchepesi, situated at the eastern foot of the hill Mrietu and overlooking the Likugu valley.

We were now leaving the Mihavani district and again entering the country of the pure Lomwe. The district of Mihavani, the eastern limit of which we had now reached, is bounded on the south by the hills Mrupa, Mirigwi and Marata, three fine hills of considerable altitude, which are conspicuously visible from this point and about 15 miles to the southward.

From what I could gather of the origin and formation of this branch of the Lomwe tribe, it appears that when this portion of the Lomwe country was overrun and conquered by the Maravi who had fled from their own country to escape the irresistible Mangoni, one powerful chief ruled over the whole country from Matakawe to Marata. This chief had eleven sons, to each of whom, when he died, he bequeathed a portion of his country, and thus it came about that Mihavani was split up into a number of petty chiefdoms. Nangoma, Makanyera, and Namusula all told me that they were descendants of this chief.

Although the people of this district form undoubtedly a branch of the Lomwe tribe, they are in many respects distinct from and seem to consider themselves superior to them. The mixture of Maravi with Lomwe

blood seems certainly to have produced a race more intelligent than the Lomwe pure or the Makua. They appear to have less of the negro about them; their features are more regular; their complexion lighter, and they show greater capabilities than, at all events the Makua, in the ingenuity with which they work in both cotton and iron.

One very peculiar custom I noticed amongst them, which I have never seen elsewhere. Their women, in addition to the *ndoma* or upper lip-ring, wear a thin iron rod, four to five inches in length, in the lower lip. A few of these I managed to secure and have sent them home to the Secretary of your Society.

With the greater intellectual capacity of which I have spoken, there exists a greater aptitude for progress, and naturally this district, so suitable in its physical features, would seem to promise a favourable field for mission-work. But like the Ajawa, who are the most apt and intelligent of the tribes adjacent to the Nyassa, they are the greatest slave dealers; for they take up with greatest facility the ideas of their only teachers the coast traders, and they appear to be preferred by them as their easiest tools for carrying out the work of slave hunting.

From Mwanamchepesi a short march brings you to the Likugu river, flowing straight from the southern face of Namuli Mountain, which is clearly visible. The river was forded a few hundred yards below the junction of the Mtivasi with it.

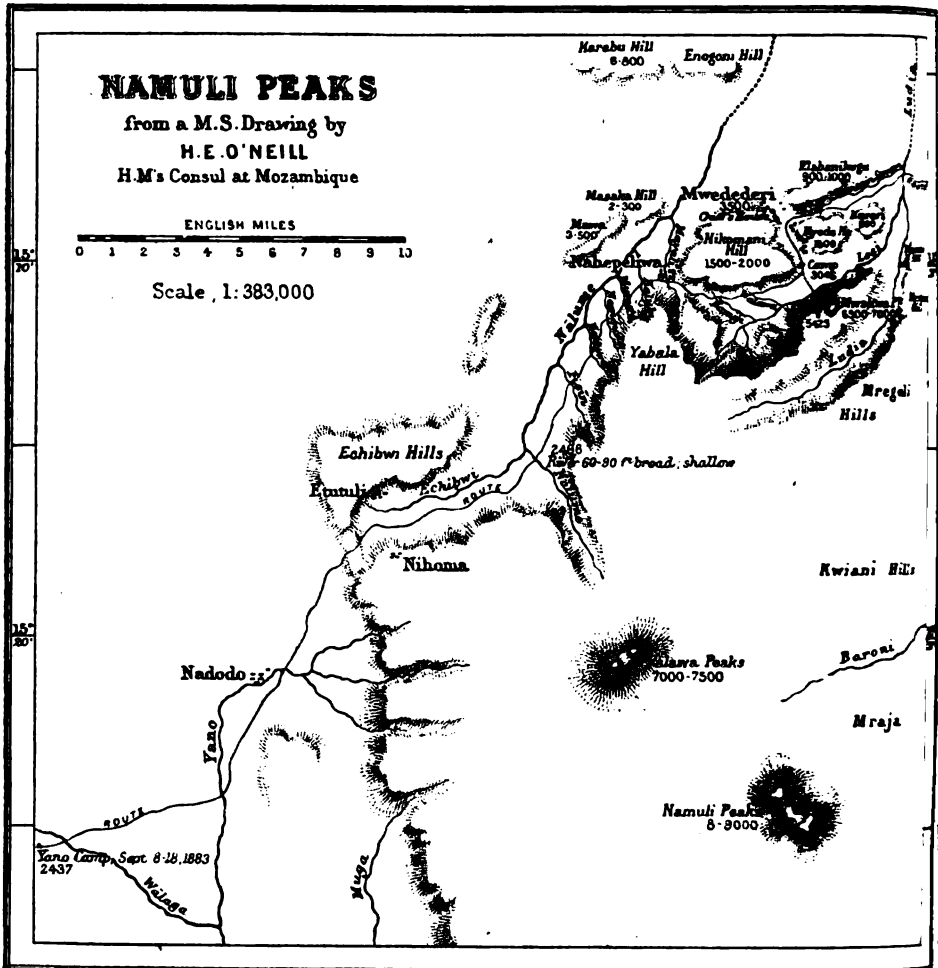
Namuli Peak bears from this point N. 26° E. (true) var. 16° west. I have now almost circled it, and have therefore seen it from every point of view. Its shape is peculiar and unlike that of all other mountain peaks that I have seen in the Makua and Lomwe countries. Almost without exception these are cone-shaped. Namuli, on the contrary, is flat-topped; but the summit presents a far sharper appearance upon an easterly and westerly bearing than upon a northerly and southerly. It is evident that its shape is that of a sharp ellipse, the longer axis lying approximately east and west.

It has been suggested by some that the mountain is probably an extinct volcano. I could not hear anything to confirm this; but in truth I had great difficulty in getting any Lomwe to speak freely of this peak. Their reluctance seems to proceed from the feeling of veneration or rather superstition with which they regard it, and of which I have before spoken. It is a *sanctum sanctorum* about which it is almost sacrilege to speak, more especially to a stranger, the object of whose inquiries they cannot understand.

If, however, we may be permitted to form any conclusion from its distinctive shape, I am inclined to think it may be volcanic. I have twice ascended Vesuvius, and remember well that after passing the hard belt of lava which encircles the mountain up to a certain point, our last and worst tug before reaching the mouth of the crater was a truncated cone, the surface of which consisted of loose incoherent ash. This, indeed,

I believe is the typical shape of an active volcano which has but one orifice, and that at its extreme summit.

Namuli has every appearance of a volcano long extinct, whose upper cone or crater has given way to the action of atmospheric forces until it has nearly or altogether disappeared. The altitude of the mountain has



thus been lowered until the mass of consolidated lava being reached, the summit has assumed its present shape. It is well known that the disappearance of the upper cone or crater takes place, with more or less rapidity, in all extinct volcanoes, and we are told that there is a volcanic mountain in Java that has diminished in altitude nearly 4000 feet in this manner. May not the Lomwe tradition that the first man and

woman came "out of" Namuli be also taken as an indication that the mountain possesses an excavated or crater-summit?

It will be necessary to give some name to the range that, as far as I have observed it, extends from the hills immediately surrounding Namuli, S.S.W.ward to and beyond the hills Mrupa, Mirigwi, and Marata. In preference to an altogether imaginative name, I would call this the "Lomwe range," from the people who inhabit it, or it might be called the "Namuli range." The former, I think, would be best, for the latter would have no signification with the natives, who apply the name solely to the block of hills surrounding Namuli Peak.

It is worth while to notice how, in the vast area of country known hitherto as "Makua Land," the hills gradually become more and more detached, and, with some notable exceptions, diminish in altitude as you proceed from south-west to north-east. The Rev. Chauncy Maples, the only traveller who has passed through the country north of the Luli river, has told us of a few isolated hills; but his verdict upon its general character shows it to be tame, sterile, and devoid of any conspicuous natural features. "Bare, uninteresting, monotonous, and dreary," are the words that he applies to the country north of the Luli. Mr. Thomson also speaks of it as "a slightly undulating country, at one time spreading out into a great plain, at another forming a narrow valley."

This truly is the general character of the country to the north and east. But as you work southward and westward you will see that the hills lose their isolation and that there is sufficient continuity to enable you to clearly outline the range. You may even, I think, with little difficulty and fair accuracy, from the positions of the principal peaks, outline the various ridges that form the water-partings of the rivers of the northern part of the coast.

Let the eye travel round from the Inagu range to the hills Mlema, Riani, Mawili, Ribawe, Mwima, Nipügo, Mwaja, and Eradi, and I think you have the principal links of a ridge that forms the water-parting between the great Luli system of drainage to the northward, and the Mkubure—and at its western extremity the Ligonya—to the southward. I have only mentioned the most conspicuous of these hills and peaks. There are many minor ones upon the same line, all named by the natives, which if enumerated would make the connection much closer. The Chiga range also will connect to the eastward, though by a low and almost imperceptible rising, with the hills Ndimwe, Kngue and Erewe, and the ridge thus formed parts the southern tributaries of the Mkubure from those of the rivers Mji Mkwali and Mluli. Again, the Namuli Hills divide, in the neighbourhood of Namuli Peak, the river Likugu from some important affluents of the Luli, and if, as I think may eventually

be found to be the case, this range curving round to the westward connects with Milanje or the mountains south of it, it separates the rivers of that part of the coast from those that feed Lake Kilwa and the Shiré river.

A short walk after crossing the Likugu brought us to the village of Nawārūma, pleasantly situated, but low, in the valley of the river Paje. I remained here four days to take lunars in order to get the approximate longitude of the Likugu river at this point, and succeeded in getting forty-eight fair distances.

A thickening of the population is very noticeable immediately you enter the Likugu valley, and the number of villages to be passed and importunate chiefs to be satisfied had a considerable effect in shortening our stages. On the 18th we continued our march, but reached no further than the village of Mshilubi, an hour's walk to the S.S.W.

Mshilubi is another of the many delightful spots I have visited in the Lomwe country which would strongly attract the European colonist. The inhabitants have fixed their village high up upon the eastern slope of the hill Ishigani, which overlooks to the westward the valley of the Likugu and to the eastward a broad plain watered by the rivers Ruaha and Kokola, affluents of the Likugu. The view across the plain is diversified by the hills Itaje, Njeshima, and others further east about Malua, which, though detached, are some of them of considerable size and altitude. Open to the breezes to the south and east, and at an altitude of 1000-1200 feet above the level of the plain, Mshilubi enjoys a temperature that even in November was pleasantly fresh and cool.

At Mshilubi I had the choice of two roads to the coast, one leading eastward and only a little southward through Malugu and Malua to Hoshia, the other striking due south, following the valley of the Likugu downwards for another three days until Nikula was reached. My guides struggled hard to secure the former as being the shortest and most direct; I strove equally hard to gain the latter, for it led more directly through the heart of the Lomwe country, and enabled me also to cover a greater extent of country on my return route. It also secured my crossing every important river between the Likugu and Angoche, when I turned eastwards.

The guides' report of the country to be passed over was most unfavourable. The Lomwe to be encountered were the "wildest of the wild," "mkali mnu" and even traders were said to avoid them. They were cutthroats and murderers. A small portion of this was true. I had long since heard that in this part of the Lomwe country, traders did not often go. But the reason was a simple one. The Lomwe objected to their people being carried off as slaves, and this in the majority of cases was the coast-traders' quest.

I have, however, steadfastly disbelieved in their reported anxiety to cut people's throats who did them no harm, and whose passing was only

a source of profit to them. There is no doubt that at times the coast-trader suffers severely from the effects of the slave trade, and I will give an example, which will also explain the manner in which the Lomwe chiefs have earned the reputation for savagery that has been accorded them.

Some years ago the child of a Lomwe chief was kidnapped and carried off to the coast as a slave. There he changed masters, and was brought up in the house of an M-yao trader. The child having developed into boyhood, he accompanied his master on a trading excursion, and it so happened that in the course of this journey they visited the district of which his father was the chief. There the boy was recognised by his mother. The chief, regardless of the fact that the boy's present master was perfectly innocent of the carrying off of the boy, determined on a fearful vengeance. Treating the trader and his companions—I am told there were several in company—with every civility, he gave them guides to conduct them some distance upon their journey. These guides led the party to a spot where others lay in waiting, and at night they were attacked, the traders murdered, and their goods carried off to the chief.

In the dispute as to which road should be taken, I am glad to say I triumphed over my guides, though I believe I owed my success to nothing more than a most gorgeous smoking-cap with which I captivated the eye of the chief, and which I promised to make his own if he would give me guides to Nanzizi.

Leaving Mshilubi, our route led directly down the valley of the Likugu river, crossing a number of its tributary streams, of which the Kokola was the most important. At noon of the same day we recrossed the Likugu from east to west, and continued our march for a short distance upon the right bank, encamping at a village called Ananihobe. From observations taken here, I place the latitude of this second ford at $15^{\circ} 54' S$.

I have never in any part of Eastern Africa seen the population so dense as in the Likugu valley. In seven hours' march this day we passed through six good-sized villages, and sighted others upon the hills to the west of us. It is hardly too much to say that we walked out of one village into another. We certainly had hardly left the shambas of one before we entered those of the next.

Upon the second day after Mshilubi was left, we reached the foot of Paje Hill, upon meeting which the river Likugu deflects to the eastward before resuming its southerly course. In order to avoid the circuit that the river here makes, we now left the valley and struck across the hills. Had I kept upon the banks of the river I was told that I should have met with the same constant succession of villages that I noticed on the first day. The populous character of this district and its evident security and quiet convinced me that the words of my guide were true, and that few traders had as yet penetrated it.

The country between Mshilubi and Nanzizi forms a sort of neutral ground between the route from Mozambique to the interior and that from Angoche to the interior, and traders rarely cross from one to the other.*

I think the Lomwe of the Likugu valley are a little too strong, too united for the slave dealers. Those who pass through their country find it necessary to mass together and form large and strong parties. Only last year a caravan of not less than 1800 souls carrying ivory and slaves, was led by a chief called Matabwiri, from the country about Milanje Mountain to Angoche.

These Lomwe do not, however, show any traces of inferiority to those that live upon and in the neighbourhood of the trade routes. On the contrary, they gave me the impression of being in some respects superior to any I had hitherto met. I have never in any part of the country seen houses equal to those that met my eye in this district. Instead of the usual beehive-looking structure common to most parts of interior Africa, to get into which you have almost to crawl on hands and knees, many of these houses were of oblong shape, with a frontage of 15 and 20 feet, strongly constructed, and with doors and a verandah which you could enter without stooping your head. One corner of the verandah of all houses of this construction was neatly railed in and formed the family *baraza*, and in it the women and children of the family might be seen throughout the day at work, carrying out their various domestic duties.

After ascending the hill Paje and in crossing the spur that the Namuli Hills throw out here to the eastward, our path led up hill and down dale until the village of Anaketi was reached upon the stream Namluvia. Here we passed the night, and continuing our march at daybreak, arrived at noon of the 23rd of November, for the third time, upon the banks of the Likugu. It was from this ford, which is called indifferently Nikula or Anansiku, after the villages upon the left and right banks, that we were to strike eastward to the coast, joining the route to Angoche at Nanzizi. I place it in lat. 16° 15' S.

Here, when my journey was all but ended, or at least four-fifths of it accomplished, I was attacked with bad fever complicated by congestion of the liver, and completely prostrated for nearly twenty days, during which I only got on one stage. I could not have had a worse time for delay. The rain which had been threatening for some time past, now came down upon us with true tropical violence and fury, and the country, before most favourable for travelling, began to get swampy and unhealthy. The rivers, too, swelled rapidly, and many of the fords becoming impassable, we were delayed at some to cut down trees, and at others to build birch canoes to cross them. Neither on the Mōlugwi or

* There is a connection between the two, but much nearer to the coast and by the route it was first arranged I should take, via Malugu and Malua to Hoshia.

the Ligonya did we find native canoes in which we could transport our baggage.

I must not, however, leave the Likugu without dispelling an illusion which has existed for some time past regarding this river. It is the only river of the coast, from the Rovuma to the Zambesi, which native report has led us to hope would be found navigable. So much credence had been placed in these reports by some, that the Director of Public Works of this province, in an official despatch, dated August 16, 1879, and addressed to the Secretary for Colonial Affairs at Lisbon, suggested it as a possible alternative and shorter route to the interior than the Zambesi and Shiré. One could not therefore but feel the strongest interest in the settlement of this question, and my interest in it was greatly increased when I saw the density of population upon its banks, and thought of the advantages that would accrue both to commerce and the people were a deep waterway discovered leading from the coast into their midst.

I can now say without hesitation that it is quite unnavigable above the parallel of $16^{\circ} 15'$ S., or the latitude of the last ford crossed by me, and that it presents no appearance of being navigable for some distance below that.

Its bed alters greatly in character between the first and third fords. At the first, which was within 20 miles of its ultimate source, I found it about 80 yards broad, shallow, and broken up with boulders; but the water-marks on the banks showed that in the rains it increased in breadth to 200 and 300 yards. At the second, its width was not less than 1000 yards, and the bed, which was here of a sandy nature, was so cut up with islands, that in fording we passed over four. These islands were well wooded, and raised above the level of its waters some 10 or 15 feet. The aspect of the river at the last crossing, from the point of navigability, was even worse than at the previous two. Though deep and only passable with difficulty in a canoe owing to the powerful sweep of the stream, both above and below the point crossed the river rushed over a bed of large jutting rocks, forming a series of rapids that put its navigation at any season of the year quite out of the question. The river falls from 1728 feet above sea-level in lat. $15^{\circ} 40'$ S. to 1207 feet in lat. $16^{\circ} 15'$ S., or 521 feet in 35 miles of latitude.

Again, masters of coasters report the mouth to be so blocked by sand-banks as to be dangerous even for dhows, and I believe it is a fact that dhows rarely, if ever, enter it, although the adjacent rivers of Macusse and Mriazi form regular ports of call. Taking everything into consideration, I fear we must dismiss all hope of its ever being utilised as a waterway into the interior.

After a delay at the village of Müli of eleven days, we recommenced our journey to the coast, my weak state compelling me to be carried in a roughly improvised *machilla*, a species of conveyance not unlike the

Anglo-Indian palanquin and the usual mode of progression with the Portuguese of this coast. The same day we arrived at Nanzizi joining here the trade route to Angoche.

I find in my note-book here, "the chief very kindly ordered the public baraza in the centre of the village to be cleared, in order that I might fix my tent, which leaks considerably, within it. Through this no rain can penetrate, and it also gives a very grateful shade." And from this to the coast I almost invariably got permission to fix my tent in the same sheltered spot. I mention this little fact to show the hospitality of these people, who at considerable inconvenience to themselves—for the public baraza is as a rule thronged throughout the day—set apart their place of audience solely to add to my convenience and comfort.

Upon the first day after leaving Nanzizi we crossed the Nishoti river, an affluent of the Namama which unites with the Moniga or Quizungu river.

The Quizungu, or "Tejungo" of the British Admiralty charts, is marked as forming at its mouth one of the finest harbours of this coast, and natives generally speak of it as being navigable for some distance into the interior; but that this is not the case is, I think, proved by the fact that I did not cross, nor anywhere came near the main river, although my line of march at this point was not more than 50 miles from the coast.

The first river of any importance next to the Likugu reached by me was the Mlela, a broad fine stream which is said to have its source in the hills about Malua. This river, which is unnamed on our charts, discharges itself into the sea a little north of the Quizungu.

I may perhaps be permitted here to say that the information I gave some time back to the Royal Geographical Society respecting the rivers that rise a considerable distance in the interior upon this part of the coast, has been perfectly confirmed by the results of my present journey. As far back as March 1882 I wrote,* "The only rivers that extend a considerable distance inland and have their sources in the interior districts are the Mluli, Ligonya, Mólugwi, Mlela, and Likugu." These rivers which I then named, are the only ones of any size and importance that I met with upon my route from the hilly districts of the interior to the coast at Angoche.

The country passed over from Nanzizi to the coast, upon a line that kept throughout between the 16th and 17th parallels of latitude, alters very little in character. After the range of hills west of the Likugu is left behind very few hills are seen, and these are isolated and of considerable altitude. A lightly wooded, gently undulating country, with numerous swampy depressions and sinking gradually to the coast, takes the place of the broken and comparatively rocky route passed over by me

* Vide 'Proceedings of the Royal Geographical Society,' Oct. 1882.

from Mozambique to the interior. It is, however, better watered, and I am inclined to say is more fertile.

Until I reached the neighbourhood of the Mlela river I could see no decrease in the density of the population. In three very short stages upon December 21st, 22nd and 23rd, we passed through no less than twelve villages, all distinct from each other and ruled over by independent chiefs. Again quoting from my note-book, I find the following remark: "*Dec. 22nd.* To-day we passed for an hour through the first piece of uncultivated country that I have seen since leaving the Likugu." This, I think, will give some idea of the populous nature and cultivated character of that district.

But after passing the Mlela, and indeed a short time before I arrived at it, I began to notice a very sensible decrease in the number of villages on my line of route, and the sight of one Nērua, deserted and a heap of ruins, threw a little light into the cause of this decrease. I had again reached a field of the coast slave dealers. Only six weeks before my arrival Nērua had been a flourishing and populous village, as I could easily see from the number of its ruined houses and size of the adjacent shambas which had not had time to get overgrown, so recent had been their destruction.

The raid in which this village had been destroyed appears to have been organised by a coast trader, living near the Moma river—a half-caste born of a Makua mother by an Arab father—in conjunction with the chief Hoshia, and the main object was undoubtedly, the collection of slaves. All the natives of whom I inquired informed me that Nērua was not the only village destroyed by them, but that they afterwards extended their operations and carried war over a good deal of the surrounding country.

As the slave trade of this country, past as well as present, has a distinct bearing upon its condition, and moreover is a subject of general interest, I may I hope be allowed to say a few words respecting it here.

A trade that has had a growth of two centuries and a half, commencing in the year 1645—when the Portuguese settlements of the West African coast fell into the hands of the Dutch—must, it is evident to all, have taken a strong hold upon the country and deeply stamped its impression upon the people. Some efforts have been made of late years to prove that the slave trade in the Makua country and on the Mozambique coast is extinct; but unhappily the evidence of those few who have passed *through* the country goes to show that this is by no means the case.

It is not what it was in its "palmy days" of the latter half of the last and beginning of this century, when, it being legalised and protected by the Government, all the colonists, more or less engaged in it, to the exclusion of other more healthful industries; when bishops seated on a throne of marble blessed and baptized the gangs as they

passed shackled to the shore for embarkation; * when the exportation of hundreds of thousands of slaves was registered each year from the west and east coasts,† and the duty levied per head constituted the chief source of income of the Colonial Treasuries.

But it still forms by no means an insignificant part of the trade of the country, and it is not too much to say that all the native chiefs deal, more or less, in slaves. Upon every journey I have taken into the interior I have met parties of slaves being brought down to the coast. Our missionaries upon the Nyassa and in the district of the Rovuma tell us that within the past two or three years there has been an augmentation rather than a diminution of slave hunting, both east and west of the Nyassa, to satisfy the demands of coast slave dealers. The Rev. Chauncy Maples, in his interesting and valuable paper upon the Medo country, read before your Society in March 1882, has already told you that with his own eyes he saw a caravan of nearly 2000 souls, the great majority of which were slaves, being brought down to the coast in the neighbourhood of Ibo. In the same year large parties arrived at Masimbwa, midway between Ibo and Cape Delgado, carrying both ivory and slaves. And still more recently a caravan of 1800 souls arrived in the neighbourhood of Angoche with about 500 large and many small tusks of ivory, and over 500 slaves. Upon the journey I have just accomplished, on two occasions runaways from slave parties sought my protection. One case was that of the sailor of a dhow from Mozambique which had been wrecked at the mouth of the Moniga (Quizungu) river. The crew escaped to the shore and were finding their way up the coast, when they were all captured and made slaves by a coast chief. I succeeded in ransoming this poor fellow for a small supply of cloth. Again, it is impossible to satisfactorily explain the depopulation of the coast belt,

* "As levas de escravos iam baptizados, e ainda em nossos dias um viajante viu na alfandega de Loanda a cadeira de marmore d'onde o Bispo no caes abençoava os rebanhos de negros que embarcavam para o Brazil."—*O Brazil e as Colonias Portuguezas*, por J. P. Oliveira Martins, Lisboa 1880.

† "Exportação de escravos de 1807 ao estabelecimento dos cruzeiros 1819 :—

I.			
Para o Brazil	680,000		
„ as colonias hespanhões	615,000		2,194,000
„ outros pontos	562,000		
Perda em viagem	337,000		
II.			
Idem desde 1819 a 1847 :—			
Para o Brazil	1,122,000		2,758,000
„ as colonias hesp.	831,000		
Perda em viagem	688,000		
Capturados	117,000		
Total ..			4,952,000 "

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they is the discovery of the important
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was quite impassable, with goods and baggage, in the only native canoe we found at the ford. Here the skill of my Mozambique boatmen proved invaluable, and by evening of the 15th they had felled and stripped trees and sewn together a large bark canoe, in which the whole party was transported before nightfall.

In my paper on "The Coast Lands and some Rivers and Ports of Mozambique,"* I have placed the mouth of this river in the very centre of the large delta marked on our charts and the Royal Geographical Society's large scale map as the "Kisungu delta," and I could hear nothing upon this journey to lead me to alter this. All the information I have gathered upon this point tends to confirm the statement I then made, that this "delta" will probably be found to be the product of three separate rivers, the Mwalaka, Mólugwi, and Mwebasi or Maravoni, the Mólugwi being by far the largest of the three. All these discharge themselves very close to and possibly connect with each other in a manner similar to the Mriazi and Moniga.

The whole of the latter portion of my journey was performed in constant and heavy rains. Arriving on the banks of the Ligonya on the 18th, we were again obliged to construct our means of transport, a work of greater difficulty here, as suitable trees were scarce. In its swollen state the Ligonya presented the appearance of a very noble river, sweeping with considerable velocity between banks at least 1000 yards apart. But some half-sunken islands in the midst, covered with reeds, and sandbanks awash near the shore, lead me to fear that it does not differ in character from the generality of East African rivers. It rises, however, far inland, having its source in the streams that run off the southern slopes of the Inagu Hills.

On the 20th we crossed what was named to me as the Kokola river, but which had every appearance of a tidal *chor*, and an hour after crossing this we arrived on the banks of the Moma, a swift stream some 30 to 40 yards broad. Although the mouth of the Moma has led some to suppose that the river extends a considerable distance into the interior, the natives assure me that it has its source a very short distance inland of the point at which it was crossed by us.

On the 21st we halted at the village of Karoba, named by me in a previous paper † as the most influential Makua chief of this district. Thence we turned southwards towards the shore, reaching the sea on the same day, and camping at night at a coast village called Anahapia.

Upon the next day we reached the river Laridi, and on the 23rd of January crossed the southern branch of the Mluli. This is probably that branch of the Mluli delta which is called the Natiti at its mouth, and which has been thus named in the map that illustrates my paper on this coast.

The last two days of our journey we marched through a highly

* 'Proceedings R. G. S.,' Oct. 1882.

† Ibid.

cultivated and populous country, in which the oil-seed amendoim forms one of the chief products under cultivation. On January the 24th we reached the village of Mluli, the residence of an Arab chief called Sultan Suliman, who owns allegiance to the Portuguese Government.

Here to my great surprise and pleasure I found that the Governor of Angoche, Major Alfredo A. F. Machado, had sent his secretary to meet me, and in addition to this act of courtesy and kindness, had provided boats to convey all my party to Parapato. I was relieved, therefore, of all trouble and delay at Mluli, and left immediately, arriving at Parapato on the evening of the 25th.

I cannot find words to express my gratitude for the cordial and generous hospitality with which I was received by the Governor, who had kindly prepared, regardless of expense and trouble, everything I could possibly want for myself and my whole party. I will only say that it falls to the lot of few travellers to receive a warmer welcome upon their return.

My journey was now ended. Two dhows were procured without difficulty to carry my whole party, and on the 28th we embarked and made sail for Mozambique, at which, favoured by a southerly wind, we arrived on January 29th, after an absence of close upon eight months.

The general results of this journey may be summed up in a few words. Nearly 1400 miles of country, hitherto untraversed by any white—notwithstanding that the coast-line has been in the possession of a European nation for nearly 400 years—has been opened up by it; an important correction made, in the reduction of the length of Lake Kilwa by nearly one-fourth of that which it has been given hitherto in all maps, and the northern and north-eastern shore of that lake explored and the position of its islands I trust fairly accurately fixed; two unknown lakes discovered and the exact relation of Lake Kilwa to the Lujenda drainage system for the first time laid down; and lastly, two new routes opened up to the Nyassa district from the Mozambique coast, both from important commercial centres, namely, the capital of the province and the trading settlement of Angoche.

Another result of this journey is the discovery of the important place and great proportion of country occupied by the Lomwe tribe in that hitherto known by us as "Makua-land," and supposed to be inhabited solely by the Makua race.

Unquestionably the Lomwe occupy the richest and to Europeans the most attractive part of the country lying between the Mozambique coast and the Nyassa. To the northward, the rich and fertile valleys of the Malema, Nalume, Nalawa and Bwibwi, and the district about the upper waters of the Luli itself are occupied by them, and the healthy and picturesque country about the Namuli Hills may be called their central home. To the southward—and this only confirms what was written by my predecessor in a narrative of a sea journey made by him to the

mouth of the Quizungu river—the country occupied by them is separated from the sea-shore by only a narrow belt of Makua. And personal observation has shown me that the hilly districts south of Namuli and the valleys of the Yano, Lukotokwa, and Upper Likugu are peopled by and only by, the Lomwe race.

The opening up of this rich Lomwe country to legitimate commerce, and the best means by which this people are to be reached, in order that the forces of civilisation may be brought to bear upon them, to extinguish the slave trade and lift them out of the state of barbarism in which they now are, are questions that will at once present themselves to all who are interested in the welfare of the native races of Eastern Africa.

My own researches, personal and otherwise, compel me to say that I fear no readily accessible means of communication will be found to this interior district from the coast. None of the rivers which flow through this country furnish a waterway to the interior. Of the two routes passed over by me, the southern, on account of the magnitude and number of the rivers that cross it, presents such difficulties during and after the rainy season, that for several months in the year it may be pronounced to be practically useless as a trade route, for the carrying over it of goods or produce in large quantities. The same objection offers an insuperable obstacle to the construction of a road which could be traversed by waggons; for the bridging of such rivers as the Likugu, Ligonya, Mälugwi, and Mlela, is a work hardly necessary to consider whilst the country is in its present undeveloped state.

The more northern route from Mozambique, though it passes over country of a more rocky nature, offers no obstacle to the construction of a waggon road until the Inagu and Namuli Hills are reached. The observations for altitudes above sea-level that I have taken upon this route, will show that the gradient is an easy one from the coast to the Inagu Hills. These hills may easily be avoided by making a detour to the north or south. The latter would be preferable, for by it the Malema and Nälume rivers would be escaped, whilst the Ligonya and Likugu would only be met with at their very head and source. The Namuli Hills may then be ascended by an easy incline up the valley of one of the Likugu tributaries, as the Namwilasi, Mwitiwe, or even Lukotokwa, though the latter would be taking a direction unnecessarily far south. Once these hills are crossed, there is no further physical obstacle, for the descent is commenced into the Central African basin.

The curious fact will be noticed that the traveller upon this route keeps, roughly speaking, steadily along the ridge which parts the rivers that discharge themselves respectively north and south of Mozambique, so that at no point is any river crossed except at its head, where its bed

is narrow, its waters shallow, and their velocity easily overcome. The Ngambo, Mluli, Mkubure, Malema, Nalume, Ligonya, Likugu, and Luli or Lurio, are all met with close to their source.

In my opinion the Lomwe country will be best attacked—I use this word in its most peaceful sense—from the interior, using the Zambesi and Shiré rivers as a means of communication with the coast. Probably the readiest way of reaching the district surrounding Namuli Mountain will be by crossing or rounding the northern extremity of Lake Kilwa and then following the route taken by me, and I think even the valley of the Upper Likugu may be easiest come at from the south of Lake Kilwa, to which undoubtedly a trade route—though I think one not much frequented—exists.

In concluding, I must express my acknowledgments and grateful thanks for the co-operation readily granted me by His Excellency the Governor-General of Mozambique, Colonel Agostinho Coelho, who directed that I should be supplied by the Department of Public Works with any instrument I might require, and to whose kindness I am indebted for the sextant with which the greater part of my observations were taken.

MOZAMBIQUE, *March 24, 1884.*

GEOGRAPHICAL NOTES.

Mr. O'Neill's Return from Blantyre.—In the October No. of the 'Proceedings' (p. 578) we recorded Mr. Consul O'Neill's visit on official business to Blantyre, via the Zambesi and the Shiré; we have now received a brief account of his return journey across the country by a partly new route to Quillimane, which he reached on the 31st of August, the journey having occupied thirty-two days. One of the objects he kept in view along the route was the tracing of the course of the Ruu river, as this stream has been frequently brought forward as the natural and proper boundary of the Portuguese territory in this direction. Observations previously taken near its left bank at Manasomba Hill, and now at Chumbaza's village near its source, together with a series of observations for latitude obtained at its junction with the Shiré by Mr. Rankin (the late Consul Foot's private secretary), enable Mr. O'Neill to trace its course with fair accuracy throughout its entire length. His route led south of Milanji Mountain, and forms a more direct road from Blantyre to the coast than that taken by the Rev. W. P. Johnson. It is one of the main channels of trade, and will be most useful whenever, as now, there is a difficulty in the river communication with Lake Nyassa. We are promised a detailed account, with a map, of this latest of Mr. O'Neill's interesting journeys.

The Basin of the Congo.—The interesting and important geographical question of the limits of the basin of the Congo has been discussed by a committee appointed for the purpose by the Diplomatic Conference on West Africa, which commenced its sittings on the 15th of November at Berlin. The committee, which was appointed on the 19th, was composed of the Plenipotentiaries and their technical associates of the Powers chiefly interested, namely, Germany, Belgium, Spain, the United States of America, France, England, Holland, and Portugal, the chairman being the French Ambassador. According to the *Times*, Mr. Stanley (on behalf of the United States) opened the discussion at the first meeting of the Committee on the 21st, by setting forth his views as to the difference between “the geographical and the commercial basins of the Congo.” The two conceptions were by no means identical, and if the Powers were to adopt the former as the basis of their declaration of free commerce, they would deprive the trade from the Upper Congo of its natural and necessary outlet, which outlet should be measured by a littoral of about 380 miles on the west coast, and on the east the basin should be bounded by a line from the 5th degree of (south) latitude to the right bank of the Zambesi. In fact, it would comprise all the affluents of the Congo, and of the great central lakes connected with it. The rapids of the Congo render it impracticable as an exclusive trade route, and hence divergent channels of exit must be made available; thus, for example, M. de Brazza had reached the middle course of the Congo by way of the Ogowé and the northern affluents of the Congo, and the trade from those affluents would best reach the sea by this route to the French possessions on the Gaboon. The Powers, therefore, would have to adopt the commercial conception of the basin, which implied a much greater stretch of the western littoral, and comprised all the centre of Africa, and extended even to the eastern shore of the continent. The *Times* further reports that the English members found nothing to object to in Mr. Stanley’s contention, while it was warmly supported by the representatives of Holland and Belgium. The representative of Italy reserved his opinion, but Mr. Stanley’s definition was combated by the delegate of Portugal, as well as by M. Ballay, on behalf of France, who argued that the affluents of the Congo should be included only below Stanley Falls, which would give a littoral exit corresponding very nearly with the merely geographical basin.—It is reported that the Conference has accepted the geographical basin as the area to be declared open to free trade, but with an enlargement of the trade outlet on the west coast, which, instead of being confined to the Congo mouth, will include the whole coast-line from the river Loje on the south, to Sette on the north.

Geographical Position of International Stations on the Congo.—Mr. George Grenfell (the author of the paper on the Cameroons District published in the ‘Proceedings’ for 1882, p. 585) has sent us a brief

account of two journeys up the Congo from Leopoldville, which he has made this year in company with the Rev. T. J. Comber. On one of the journeys he entered the mouth of the great southern tributary the Ibari Nkutu, or Wabuma, and explored it as far as its junction with the Quango, which he ascertained to be fully 65 geographical miles distant from the point where it flows into the Congo. He found the Quango to be a fine stream, 400 to 500 yards wide, with a mean depth of 12 feet, and an average current of about $1\frac{1}{2}$ miles an hour. Mr. Grenfell sends us the following latitudes as the result of observations taken by himself and his companion:—

Leopoldville ..	4° 20' S.	From a series of observations.
Kwa mouth ..	3° 14'	March 2nd, 1884, Mer. Alt. Canopus.
Bolobo	2° 13'	July 18th, 1884, α Centauri.
Lukolela ..	1° 7'	February 26th, 1884, Canopus.
Nganda *	0° 4' N.	July 27th, 1884, Sun's Mer. Alt.

Mr. Comber, we are sorry to hear, was suffering from ill health; feeling the effects of six years' continuous residence on the river.

Recent News from the Interior of Benguella.—The American missionaries stationed for several years at Bailunda, in the country to the rear of the Portuguese province of Benguella, have been expelled by order of the native king, and their colleagues at the Bihe station joining them, they retreated to the coast at Benguella; but all their property was plundered, and houses burnt. Scarcely had they been expelled, when F. Arnot, an independent missionary from Glasgow, who by the favour of Mr. Westbeach and Mr. Blockley, the well-known merchants of Pandama-tenka, had been for two years established at Lialui on the upper Zambesi, suddenly appeared from the east at Bihe, and passed on to Bailunda. He had been received with great favour by the king of the Ba-rotze. Mr. Arnot had received some mysterious hints from a headman to leave Lialui, and accompany a trader to Bihe. Civil war broke out after his departure, and his old friend the king of the Ba-rotze was killed. Mr. Arnot's unexpected appearance from the east at Bailunda astounded the chief and his people. He took advantage of their confusion, and called a court of inquiry of all the headmen. The result was the sending a letter to Benguella to recall the American missionaries. Mr. Arnot himself intends to retrace his steps to the valley of the Zambesi, but to the north of the Lialui. It appears thus that Mr. Arnot, who had worked his way from Durban to Potchefstroom, and thence to Shoshong across the Kalahari desert to the junction of the rivers Chobe and Zambesi, and thence up that river to Lialui and on to Bailunda, had traversed in the reverse direction the whole course of Serpa Pinto.

The "Victoria Falls" of the Curitiba.—To the notice of Don Ramon Lista's account of this cataract of the Curitiba-or I-guazù, given above,

* A place about three miles south of the Uruki river.

p. 581, should be added that there is also a much fuller description by Herr Gustav Niederlein in his Notes on the First Germano-Argentine Colonial Land-surveying Expedition to Misiones in 1883, given in the 'Verhandlungen der Gesellschaft für Erdkunde zu Berlin,' vol. x. pp. 357-364, under the title "Hundert Cataracte des Y-Guazu in Misiones." The three sections of the fall referred to by Don Ramon are named Kaiser Dom Pedro-, Kaiser Wilhelm-, and General Roca Falls, which respectively represent the Brazilian, Insular, and Argentine portions of the whole. A "König-Albert" Archipelago, "Fürst Bismarck" Cataract, and other names are imposed upon various prominent physical features.

Mr. A. P. Maudslay's collection of sculptures obtained by him from the temple on the Usumacinta river in Guatemala, and described in his paper in the 'Proceedings' for 1883, p. 185, are now on view to Fellows and their friends in the Map-room of the Society.

Erratum.—In the map illustrating Sir R. W. Rawson's paper on the Territorial Partition of Africa there is a serious error in the position of Bousa on the Niger. This place is not situated, as there represented, to the south of the junction of the Benué, but to the north of it, in lat. $10^{\circ} 15' N.$ and long. $4^{\circ} 25' E.$, as stated in the paper at p. 621. The error was rectified as soon as it was observed, and some impressions of the corrected map have been since issued.

CORRESPONDENCE.

Major Serpa Pinto's New Expedition across Africa from Mozambique.

Mozambique, September 30th, 1884.

It may interest you, and others whose attention is fixed upon East Central Africa, to know that a large expedition is just starting from Mozambique, headed by the distinguished traveller Major Serpa Pinto, for the exploration of the interior.

The route to be taken by him is not yet made public, indeed Major Serpa Pinto himself informs me that he will be guided much by circumstances after leaving the coast. From other sources I hear that the road it is desired that the expedition shall follow is that taken by me in 1883 to Kilwa Lake; then northwards to the Tanganyika and upper waters of the Congo. It is not improbable that this expedition is working in conjunction with that headed by Major Carvalho, which has entered the Quanza river on the West Coast, and is to proceed first to the country of Muata Yanvo, and afterwards, it has been stated, is to cross Africa and make its exit on the coast of Mozambique. This expedition from the West Coast is fitted out on a large scale, as you doubtless know; it leaves with nearly 500 carriers, and over 4000*l.* has already been voted for it.

Major Serpa Pinto's expedition is got up upon almost an equally large scale, and I should say that rarely, if ever, has an expedition more perfectly equipped left for the African interior. His body-guard consists of 104 Zulus from the country west of Inhambane, each of whom has been armed with a repeating rifle, and his carriers,

numbering over 200, will most of them be armed with Sniders obtained from the local government.

Major Pinto takes with him two European companions, Lieut. Cardoso, of the Portuguese Navy, and Mr. Mapp, an Englishman, as private secretary, whose chief duty in connection with the expedition is that of photography.

No expense has been spared in fitting out this expedition with costly and reliable instruments. The following are those Major Pinto has been good enough to show me:—

Four large chronometers, by the best French and English makers.

Three half-chronometer watches.

Two telescopes—one of 60, another of 40 power, splendidly mounted and fitted to screw on to a very strong solid tripod.

Five sextants of various sizes, the largest being 5 inches radius.

Three artificial horizons of various descriptions. That of Captain George does not appear to be approved by him.

Aneroid and large mercurial barometers, prismatic compasses, boiling-point thermometers, and other minor instruments in considerable numbers, and all from well-known makers.

A very beautiful photographic camera, with two lenses and 600 dry plates.

Nearly all these instruments are carried in cases of Bessemer steel, about 30 by 15 by 10 inches in size. All his chronometers are placed in boxes of this description, enclosed in blankets. The cases are slung in strong sail-cloth girths, which admit of the passing along the lid of two stout bamboos, just far enough apart to fit easily over the shoulders of a black. This avoids the risk of a bamboo slipping off the shoulders of the carrier, as might be the case if only a single pole were used.

All stores and provisions carried by the party are carried in tin-lined boxes of uniform size, each 40 lbs. in weight when full. Four tents, amply, even luxuriously furnished, with tables, chairs, and every description of camp furniture, from which carpets even are not omitted, are taken by the party. A Berthon boat is also carried by them.

Major Serpa Pinto is also provided with two horses and four or five dogs, English retrievers and greyhounds. The horse he rides himself has been presented to him by Mr. Kruger, ex-Vice-President of the Transvaal Republic. It is what is termed in the South African colonies a "salted horse," or one which has shown itself impervious to the attacks of the tsetse fly. The second animal has not been so tried and therefore it is hoped that it will settle the question of the existence of the fly.

Major Pinto tells me that he takes chiefly upon himself the work of astronomical observation, together with the collection of botanical specimens. To Lieutenant Cardoso, who assists him in observing, he specially deposes the collection of birds, butterflies, and other natural history specimens, whilst Mr. Mapp takes charge of the commissariat and performs the photographic work of the expedition.

The scientific world may confidently expect the most valuable results from this expedition. It would be presumptuous in me to speak of Major Serpa Pinto's merits as a scientific explorer, for they are known and have been recognised by every geographical society throughout the world, and by the French Institute, of which he is a member. A practical astronomer also, with a perfect equipment at his hands, he cannot fail to bring back with him most accurate and valuable observations.

Of the progress of the expedition, as far as I can hear it, I shall have great pleasure in informing your Society.

To the Assistant-Secretary R.G.S.

H. G. O'NEILL.

REPORT OF THE EVENING MEETINGS, SESSION 1884-5.

First Meeting, 3rd November, 1884.—The Right Hon. Lord ABERDARE, President, in the Chair.

PRESENTATION.—*Rev. William Henry Groves.*

ELECTIONS.—*Rev. William H. Booth; R. C. Buck, Esq.; Rev. Robert Owen Davies, M.A.; William Woodman Graham, Esq.; William Henry Harwood, Esq.; Barnett Laurance, Esq.; Dr. William Marcet, F.R.S.; John Robert Phillips, Esq.; Sir Samuel Rous, K.C.M.G. (Governor of Gold Coast Colony); Frederick Trimmer, Esq.; Brooke M. Whithard, Esq., C.E.*

The President delivered a brief address on the opening of the new session (*ante*, p. 687). After which the following paper was read:—

“Through the Masai Country to Victoria Nyanza.” By Joseph Thomson.

The paper, with the discussion which followed, is printed *ante*, p. 690.

NEW BOOKS.

(By E. C. RYE, Librarian B.G.S.)

EUROPE.

[Greece.]—Handbook for Travellers in Greece, including the Ionian Islands, Continental Greece, the Peloponnese, the Islands of the Ægean, Crete, Albania, Thessaly, and Macedonia; and a detailed description of Athens, ancient and modern, classical and mediæval. Fifth edition, thoroughly revised and corrected. In two parts. London (John Murray): 1884, post 8vo., Pt. I. pp. xii. and 1-360, 361*-364*, and 361-380 (index); Pt. II. pp. 361-762 (incl. index repeated), maps, plans, and illustrations. Price 24s.

This edition, though based upon the old one of 1860 by Sir George F. Bowen, is so increased in bulk, as well as modified throughout, that it is practically new. It contains the results of several years' careful inquiry during a long residence and much travel in various parts of the countries described, by Miss A. F. Yule, who has added much on Mediæval History, Geology, Natural History, &c., as well as detailed accounts of the latest discoveries at Olympia, Mycenæ, Delphi, &c. The wide range of subject and the great amount of illustrative references in the notes, &c., remove this particular handbook from its class to the higher rank of instructive authorities; while the interest attaching to the country on which it is based, will, added to the special treatment, recommend it to the general reader. The number of plans, &c., is nearly tripled.

ASIA.

Colville, [Lieut.-Colonel] H. E.—The Accursed Land; or First Steps on the Water-way of Edom. London (Sampson Low, Marston & Co.): 1884, cr. 8vo., pp. viii. and 300 [no index], map, illustrations. Price 10s. 6d.

The author undertook to survey a proposed line of canal from the south end of the Dead Sea to the head of the Gulf of Akabah, on behalf of the Palestine Channel Syndicate, but the permission of the Porte having been denied, he made a hurried reconnaissance on his own responsibility, accompanied by Captain Peacocke. He crossed from Suez to Ain Mousa, and reached the Gulf of Akabah at Nawibi well, following the wadye on the southern slopes of the so-called plateau of El-Tih. Ascending the Gulf along its western coast to Akabah (where he arrived just in front of Major Kitchener and Prof. Hull,

who had started before him on a separate expedition with the like object), he followed the Wady-el-Arabah for nearly 78 miles to Wady Jeraideh, and corrected his aneroid readings by running a regular line of levels all the way back to Akabah. The return to Egypt was made by the Nakhl route, north of the Tih plateau. The well of Nawibi was found to be wrongly placed south of Wady-el-Ain on the Admiralty Chart, its latitude being also more than four miles out; the head of the Gulf of Akabah is incorrectly rendered on the chart as regards shape,—Akabah itself being placed five miles too far from it; and certain well-marked and easily distinguished peaks are neither noticed nor named.

Chapter VI. contains a description of the Wady-el-Arabah, which is divided, as far as levels are concerned, into six parts: (1) From the head of the Gulf to the summit of the cross ridge called Mekreh Hadid, a distance of 13 miles, in which a height of 250 feet is gained; (2) from Mekreh Hadid to El Ta'abah, five miles, at the end of which the level has fallen to 137 feet; (3) the marsh of El Ta'abah; (4) an ascent of 25 miles from El Ta'abah to the saddle of Rishi, 675 feet; (5) a descent of 675 feet in 20 miles between Rishi and the Wady Jeraideh; (6) the district below the sea-level between the latter and the Dead Sea. The author entirely rejects the notion of the valley having been filled up by upheaval, and demonstrates that it is a huge fissure filled up with debris, describing its present physical conditions, and the causes of its constant accessions of rocks, mud, and stones from lateral ravines during the rainy season. He arrives at the conclusion that any cutting from sea-level to sea-level would be for about 30 miles through gravel, 15 through limestone, and 15 through chalk. At Akabah, the western range has a granite base, and is composed of strata of red sandstone, limestone, and chalk, each of which formations is in ascending the valley seen to be in turn buried beneath the surface, until at Wady Jeraideh the chalk alone is left, laid bare by the removal of alluvial deposits.

Finally, the Wady-el-Houar is considered to be the main if not the sole cause of the silting up of the valley, as it has piled up 930 feet of material while the two wadys contributing to the only other barrier have only accumulated 250 feet. In avoiding the Wady-el-Houar, therefore, the greatest danger of silting is escaped. A table of routes of both journeys is given; the map is on the scale of 19 miles to the inch.

D[outhwaite], A. W.—Notes on Corea. Reprinted from 'The Star in the East' [Shanghai]. Shanghai (Shanghai Mercury Office): 1884, 12mo., pp. 81.

The author, a member of the China Inland Mission, briefly sketches in this collection of articles, the three open ports, the provinces, capital, and recent history of Corea, with some general notes, and an account of the religion and division of classes of its people. The ports are Fu-san, Yuen-san, and Jen-chuan. The first of these has been connected by submarine cable with Japan since November 1883; its harbour has good anchorage, and is well protected from typhoons by the lofty hills that almost entirely surround it. Facing the town is a large island called by foreigners "Deer Island," concerning which some errors of Oppert are corrected, its hills being 500 feet higher than stated, and instead of hundreds of horses being reared on it, not one exists on the island. Oppert's statement, that steamers ply between Fu-san and Nagasaki in four hours, is also shown to be quite wrong, as the passage of the 160 miles between those places takes from 14 to 16 hours. At p. 36, the author gives an account of an expedition to Corea in which the German writer above named acquired some experiences of the country, and which had for its unsuccessful object the desecration of tombs and carrying off the bones and relics of kings to which the natives attached a superstitious value. The population of Fu-san is estimated at 1800; there are many foreign shops in it, but all the trade is in the hands of the Japanese, the chief exports being hides, bones, gall-nuts, sea-weed, &c. Coal has been discovered a few miles from this port, but is not yet worked. The city of Fu-san is three miles from the settlement, and Tung-nai is 10 miles inland, both being mostly collections of mud huts. The roads are wide, well drained, and kept in good repair. The second port, Yuen-san (also known as Gen-san, Port Lazaref, and Broughton's Bay), is on the

east side of the peninsula, nearly half-way between Fu-san and Vladivostok. The present settlement has only about 100 residents, and is in an unhealthy position; the native town is a mile off, and consists of a long straggling street with short lanes branching from it. The houses, as usual, are built of undressed stone imbedded in clay or mud, with thatched roof; nearly all are shops, and many imported goods are sold. The chief special exports are gold (nearly 100 lbs. were taken away last November in one ship) and fish. The neighbouring country is mountainous and well wooded; and tigers and leopards are so numerous as to be a source of great danger in winter. The third port, Jen-chuan (locally Chi-mal-p'oo or Toi-wuh-p'oo), has been already described in Mr. Carles's Report noticed above, p. 287, under the name Chimulpho.

The capital, Séoul (pronounced "Say-ool") or Hanyang, has also been described by Mr. Carles, and in the preceding Report of Mr. J. C. Hall, p. 274. Its population is estimated by Mr. Douthwaite at not less than 140,000 (Mr. Hall makes it 240,000), and some interesting details are given of its Royal palace.

In his general remarks, Mr. Douthwaite decidedly opposes the accepted idea that Corea is densely peopled; he estimates the population at less than 7,000,000 (practically agreeing with the census quoted by Mr. Hall). Large herds of cattle are to be found in all parts of the country, and, next to gold, the most valuable article exported is ginseng, a species of *Panax* or ivy-wort, the root of which is highly esteemed by the Chinese on account of its valuable tonic properties.

The chief characteristics of the eight provinces or circuits called Tao into which the kingdom is divided, are shortly indicated: these are, King-ki, P'ing-an, Hien-king, Kiang-yuen, Hwang-hai, Chung-ts'ing, Ts'uen-lo, and King-shang. Of these, the smallest is King-ki, which contains the capital and the port of Jen-chuan; it is divided into 36 districts, and has a population of about 830,000, fully half of its area being (as in other parts) occupied by hills which only produce timber, and much of the coast lands being uncultivated. The castor-oil plant is largely grown, but little of anything seems to be exported.

P'ing-an is the largest province, forming the north-west border of the peninsula, separated from Manchuria by the river Ya-loo. It is reported rich in undeveloped mineral wealth, but only its south and east parts are cultivated, the population being about 1,174,000. Its so-called "cities" are mere villages. The restrictions on intercourse with China, except on the fixed days (four times a year), appear still to be kept up.

Hien-king, the most northern province, is separated from Russian Manchuria by the Teo-man Kiang; its population is under half a million, mostly living near the coast, as two-thirds of the province are uninhabited,—tigers, leopards, and black bears being very numerous in the north and west. The open port of Yuen-san is near its southern border; the governor resides at Hing-hien, 50 miles north of the port. Great jealousy of Russian intercourse prevails here, in consequence of which even the periodical trade with China has been stopped on the north.

Kiang-yuen, with an area of about 5500 square miles and a population of only 372,000, lies south of Hien-king and east of King-ki; its capital is Yuen-cheo, near the great road to Séoul. Its only large coast towns are P'ing-hai and Kan-cheng, and it has no harbours for large vessels. Much grain is raised on its plains; and arsenic and sulphur have been found in its hills. The greater part of it is mountainous and uninhabitable.

Hwang-hai, which projects into the Yellow Sea, and approaches within 80 miles of Shantung in China, has 413,000 inhabitants, who have deserted the coast and are crowded in the centre and along the road to the capital. The provincial capital is Hai-cheo. It is supposed to possess extensive seams of lead, tin, and mercury; and immense quantities of herrings are taken on its coasts, mostly by Chinese fishermen, who also smuggle the ginseng, in spite of Korean precautions.

Chung-ts'ing has an area of nearly 4780 square miles, and a population of about a million. It possesses ten or eleven walled towns, of which only Chung-cheo and Kung-cheo (the provincial capital) are of any importance. Its best

harbour is Nei Po, sheltered by the T'ai-an peninsula, but there are several fit for small craft. Near Teh-san, 25 miles inland from the Nei Po coast, are the tombs of the Royal family, on which the attempt above referred to was made.

Ts'u'en-lo, nearly 6500 square miles in extent, and with a population of 1,162,000 or thereabouts, has for its capital Ts'u'en-cheo, 20 miles from its northern border. It is the most southern province of the peninsula, containing spacious valleys capable of producing large quantities of grain, but with no market as yet for surplus. K'ang-tsing on the south, at the terminus of the great road from Séoul, and Muh-p'oo on the south-west, at the mouth of the Yung-san, are referred to as excellent localities for future foreign commerce.

King-shang, the eighth province, has a more genial climate and somewhat greater rainfall than the others, owing partly to the influence of the warm Japan current; its hills are covered with bright-coloured flowering shrubs. Although not the largest in area (7875 square miles), it is the most populous of the provinces, having 1,680,000 inhabitants, about half the number it is capable of supporting. All seem to be well fed, robust, and contented; and they are more friendly to foreigners than their northern fellow-countrymen. Cattle raising seems to be the chief occupation, and much attention is given to rearing horses of a stunted breed; the natives pay for many imports with gold-dust and nuggets, silver and quicksilver mines are reported as having been worked for many years in the north of the province, and the Japanese have discovered coal in the south, whilst the large quantities of fine silica brought down by the waters of the Hwang-tun indicate a future glass-making industry. The fisheries for shark and ribbon fish afford much occupation on the coast, there being a good market in Japan, especially for the latter, boats racing to Nagasaki with the first cargoes just as tea-ships do from China to England.

Buddhism, the old state religion, has been supplanted by Confucianism, but there is no religion in Corea as understood by western nations, in spite of the superstitious nature of the people. Christian missionaries, although violently opposed, are evidently gaining ground; and Fu-san on the south and Yuen-san on the north-east, are indicated as promising localities for their work.

[Indian Surveys.]—General Report on the Operations of the Survey of India Department, administered under the Government of India during 1882–83. Prepared under the direction of Colonel G. C. De Prée, s.c., Offg. Surveyor-General of India. Calcutta (printed at the Bengal Secretariat Press): 1884, fo., pp. 1–75, (1)–(96), (1r)–(21r). Maps and diagrams.

Notice of this important Report has been hitherto deferred, as the copy received was accompanied by an official request that it should be treated as confidential until a Government abstract of its contents was received. This abstract has not yet come to hand, but the Report has been reviewed in the public press, and the usual notice is now given in the 'Proceedings' with the sanction of the Surveyor-General.

The principal triangulation having been completed, as described in the last Report, the work in this branch of the Department has been only in secondary series (97 miles on the east coast, Ganjam and Cuttack); no action has been taken on the Singapore series, for want of funds. The Burma party, which assisted in measurement of the Mergni base-line, has amongst other work determined and fixed the heights of 15 points, 6 on the frontier, 5 on spurs of the Arakan Yoma and Pegu Yoma near the course of the Irrawaddy; 2 on the ridge of the latter range; and the remaining 2, the most northerly, on an unknown range, said to be the Karenni Mountains, in about lat. 20°, long. 96° 30', with heights of 6000 to nearly 7000 feet.

The regular topographical operations have been continued, with a general out-turn of 7384 square miles surveyed on the 4-inch, 7989 on the inch, 7855 on the 2-inch, 729 on the 4-inch, and 145 on the 6-inch scale and larger. During the past season, every opportunity has been taken to increase knowledge of the countries beyond the British frontier, by employing the regular surveyors, European and native, on such expeditions as were compatible with due precautions for their safety, as well as by extending the system hitherto peculiar to the Trigonometrical Branch, of employing native explorers,

who, in disguise, penetrate into otherwise inaccessible parts. This trans-frontier system had been commenced by the Kohat party in a previous season, and was extensively carried on during the season under report. In this way it is intended to gradually compile a map showing the whole trans-frontier of Western India, from Peshawar to Baluchistan. An expedition to the Takht-i-Suliman is under contemplation, and the regular survey of Baluchistan is being pushed on under Major Holdich, 1844 square miles having been finally mapped during the season. Operations are, however, difficult there, in consequence of the peculiar climatic conditions and tribal disturbances.

Mowzawar, Riverain, and Forest surveys have been carried on in areas of 1661, 634, and 839 square miles, and Cadastral surveys in 1252 and 2035 square miles in the N.W. Provinces and British Burma; but they demand no special mention.

The portion of the Report devoted to geographical exploration and reconnaissance is of primary interest, and was expected to contain the full account of the remarkable explorations of A—k for a period of over four years in Mongolia and Great Tibet, which was promised in the last Report. It is now stated, however, that the concise account in that Report cannot be amplified this time, as the observations are so numerous and complete, and the compilation of notes in a strange vernacular so laborious, that further delay is required. The promised map is completed and accompanies the Report, in three sheets, with a separate index; it is, however, much to be regretted that by an unfortunate mistake of draughtsmanship in applying the correction from the magnetic to the true north, the whole of this apparently excellent work is incorrect in longitude, above the 31st parallel, the error in the upper part being as much as a degree and a half too much west. These three sheets and the index have consequently been superseded by others dated June last, of which the index map is on a larger scale and gives more ample details; and the observations on p. 40 of Part 1 as to the incorrectness of Colonel Prjevalsky's position of Sachu must be considered as practically withdrawn by this new issue. A—k's own work appears to be thoroughly satisfactory; he observed the latitude at 22 stations, and his long circuit (roughly speaking, over 3000 miles in all, of extremely difficult country, and under the most disadvantageous circumstances) from Lhása northwards to Sachu, and back by Dárchendo, Báthang, Sáma and Chetang, was found to fit very satisfactorily; in his positions of Jún, Dárchando, Sáma, &c., he also agrees with Prjevalsky, Gill, Wilcox, &c. In a number of instances, he made several determinations for the same station, the total number of his observed latitudes actually computed being 171, and of heights 225. The heights of 69 places were fixed by boiling-point observations, and the highest seems to be the Nub Gang Pass, 17,940 feet, N.E. of the Archa Lake. A quite unexpected intensity of cold was found on some occasions.

Independently of the work of A—k, the geographical portion of this Report contains references to the highly successful operations in Kafiristan of Mr. W. W. McNair, already detailed in our 'Proceedings'; this explorer was accompanied as far as Chitral by another native known as "the Syud," who had before starting on this expedition traversed the direct road between Bannu and Ghazni, where he was seized and imprisoned. Still another well-trained native, the "Hakim," has brought in an exploration of the Tochi valley as far westward as the valleys of Shawal, Birmal, and Sarobi, crossing the water-parting of the Gumal and Tochi rivers, and fixing the position of the Kotanni Pass, the divide of the streams flowing into the Ghazni valley. On the north of Afghanistan, Munshi Esuf Sharif, a sub-surveyor of well-known capacity, contrived to elude the active opposition of the Jowakis (who actually fired on him and his party), and completed the survey of a tract remaining unknown, including the position of Musadarra. Further west, Mr. Claudius advanced in disguise up the valleys of the Bar Marai, Bizoti, and Bara, plane-tabling portions of the imperfectly known Sipai country, and being turned back by the fire of armed tribes within 150 yards of the summit of the Maulagárh range.

In Dardistan, the native surveyor Ahmed Ali Khan employed in sketching the country round Chiláo, as detailed in the last Report, has further prosecuted this arduous work. Although the country itself is inaccessible through the

opposition of its rulers, it is still capable of being practically surveyed, as it juts into the province of Kashmir, and is enclosed on three sides by a horse-shoe shaped range, commanding a view of almost the entire valley. Arriving in Kághán before the melting of the snows, Ahmed Ali followed this horse-shoe watershed round to Hatu Pir, and then crossing the Indus to Bunji, resumed his progress along the Indus-Ghilghit water-parting to the Bariben Pass, where he completed the required survey. Nineteen passes were fixed, varying from 12,900 feet to 17,700 (Thosho, on the Indus-Astor watershed), as well as the positions of all the villages and forts; and, besides minor glaciers, the explorer discovered one nearly eight miles in length, in the Diamerai valley, some 22 miles west of Astor. In this work, he had to pass the night on several occasions without a tent, on ground buried in snow, from 14,000 feet to 16,000 feet above the sea.

Among the accounts of the miscellaneous operations, some observations on the little-known country of Nepal are to be found. Every advantage has been taken of the work in Sikkim to sketch visible portions of Nepal and to establish a series of points; but even this is greatly hindered by the atmospheric haze in which the country is usually enveloped. A skeleton map, however, is now actually in progress.

The Appendix, containing extracts from the narrative reports of the executive officers in charge of survey parties and operations, contains (as usual) much detail of interest. Mr. J. McGill's observations on the Chilka lake region, Major C. Strahan's on the Bisnui people, Mr. H. Horst's on the valley of the Thoneseh Choung, Burma, Major H. R. Thuillier's on the Falls of Garsappa, Major Holdich's on the nature of Eastern Kohat, Col. Tanner's on the operations in Darjeeling, and Mr. W. H. Cole's on the work of Ahmed Ali Khan above mentioned, being specially noteworthy. Col. Tanner, incidentally describing the scenery of Eastern Nepal, recommends Sandakphu as commanding its most extensive and picturesque aspects. He thinks that many visitors do not see Mount Everest, and that others mistake peak "No. 13" for it—pointing out that the latter has a remarkable cup-shaped hollow at the top, whereas the cone of Everest is symmetrical. The most remote Nepal peaks visible towards the west are 120 miles off; they have not been fixed, but are supposed to lie somewhere on the left bank of the Bhotia-Koosee river, and on the Indian side of the Indo-Tibet watershed.

The maps, &c., in this Report are as follows: General India, showing progress of Imperial Surveys, to October 1, 1883, scale 125 miles to the inch; Indexes to sheets of the Rajputana, Gwalior and Central India, Khandesh and Bombay Native States, Bhopal and Malwa, Mirzapur district, Garo, Khasi and Naga Hills and N.E. frontier, South Sylhet and Tipperah Hills, Burma, Mysore, Kohat district, Guzerat, Cutch, the Bulandshahr, Aligarh, and Etah districts, and Deccan and Konkan Topographical Surveys; the Hooghly river, Baluchistan, and Hissar district Surveys; the Benares, Ghazipur and Ballia districts, Mirzapur, Gorakhpur, Tarai district, and British Burma (Hanthawaddy, Pegu, Shway-Gyin and Toungoo, Bassein and Henzada, Prome, and Tharrawaddy districts) Cadastral Surveys; Afghanistan, scale 32 miles to the inch; the Index and 3 sheets of A—k's exploration above mentioned, scale 16 miles to the inch; arcs of longitude determined through the electric telegraph; sheets of Indian Atlas published to date; state and materials of the same; tidal curves to illustrate the effects of waves caused by the volcanic eruption at Java, August 27, 1883 (3 pls.); chart of the northern portion of the Indian Ocean to illustrate Report on these supertidal waves; and a map showing changes in the Surda Straits caused by the eruption of Krakatoa, with observations, taken from Petermann's 'Mitteilungen.'

Jacobs, [Dr.] Julius.—Eenigen Tijd onder de Baliërs. Eene Reisebeschrijving met aantekeningen betreffende Hygiëne, Land- en Volkenkunde van de Eilanden Bali en Lombok. Batavia (G. Kolff): 1883, imp. 8vo., pp. III., v., VIII., & 253 [no index], map and photographic frontispiece.

Dr. Jacobs, a medical officer in the Netherlands Colonial service, left Banjoewangi, the Dutch post in the centre of the extreme eastern coast of No. XII.—DEC. 1884.]

Java, on August 10th, 1881, in the screw steamer *Watergeus*, with the main object of furthering vaccination among the inhabitants of the adjacent island of Bali. He landed on the north coast at Pabeau, thence visiting Boeleleng and working south-east to the Batoer mountain in the Bangli district and southwards past the kampong of the same name across Gjanjar to the south coast, continuing eastward along the coast to Kloengkoeng and Padang in the Karang Asem district, from which point he crossed to Lombok, landing at Ampenan on its western coast, and journeying past Mataram a little into the interior. Returning to Bali, he landed on the west of the Badoeng peninsula, crossing it in a north-easterly direction to Den Passar, and then working inland north-west across Mengwi to Tabanan, south of the axial central chain which culminates in Mount Jaer. He thus visited (and in most cases actually traversed) all the districts, except the extreme western Jembrana, south of the chain; and he returned by the southern coast to Banjoewangi in the beginning of September. A few zoological and botanical notes are scattered through the narrative of Dr. Jacob's experiences in these islands, on which so little is accessible to English readers; but his chief subject is anthropology, viewed for the most part in its medical aspects, and in many cases discussed in details that could not possibly be given in any book of travel in English, however interesting to those who in the study of ethics must acquire a knowledge of debased races.

Prschewalski, N. von.—Reisen in Tibet und am oberen Lauf des Gelben Flusses in den Jahren 1879 bis 1880 von N. von Prschewalski, Oberst im russischen Generalstab. Aus dem Russischen frei in das Deutsche übertragen, und mit Anmerkungen versehen von Stein-Nordheim. Jena (Costenoble): 1884, 8vo., pp. xiv. & 281 [no index], map and illustrations. (*Dulau*: price 6s.)

The only detailed account of Colonel Prjevalsky's Third Journey in Central Asia being in Russian (see R.G.S. 'Proceedings,' 1883, p. 431), this German version will doubtless prove very acceptable. It is, however, as intimated in the title, not an actual translation, but a free rendering; the (nearly) 500 pages of the original quarto being compressed into less than 300 octavo pages (a difference probably to be accounted for to a great extent by the large size and spacing of Russian type). The illustrations are said to be reproductions, but would be more correctly defined as reduced copies of less than half in number of the originals. The map is also a reduction to the scale of 1 : 3,500,000, and includes the routes of Szechenyi, Regel, Potanin, Rafailoff, and Sosnoffsky. In the text, the Russian reckoning of dates is retained, but distances, heights, &c., are reduced to metres, kilos, and litres. As regards the transliteration of the gallant traveller's name, which appears as Prschewalski in the body of the work and Przewalski on the maps, it may be here noted that the presentation copy in the Society's library bears the autograph of "Prjevalsky."

NEW MAPS.

(By J. COLES, *Map Curator* R.G.S.)

EUROPE.

Austro-Hungarian Monarchy.—Wall-map by Dolezal-Berghaus-Gonczy. Scale 1 : 864,000 or 11·8 geographical miles to an inch. 9 sheets. J. Perthes, Gotha. (In Hungarian.) Price 7s. (*Dulau*.)

Central-Europa.—Neue Uebersichtskarte von—, resp. der oesterreichisch-ungarischen Monarchie. Scale 1 : 750,000 or 10·3 geographical miles to an inch. Militär geograph. Institute, Wien. Sheets :—A 2, Mainz, Nürnberg, Strassburg, Ulm. B 2, Prag, Eger, Budweis, Linz, München, Regensburg. B 3, Laibach, Villach, Kufstein, Belluno. C 3, Wien, Graz, Budapest. Price 2s. each sheet. (*Dulau*.)

Danmark.—Generalstabens topographiske Kaart over—. Scale 1:40,000 or 1·8 inches to a geographical mile. Kalchographeret og graveret ved Generalstaben, Kjøbenhavn, 1883. Sheets:—Tvilum, Fjellerup, Hoed, Frijsenborg. Framley, Torning. (*Dulau.*)

Deutschen Reiches.—Karte des—. Herausgegeben von der kartogr. Abtheilung der Königl. Preuss. Landes Aufnahme 1884. Scale 1:100,000 or 1·3 geographical miles to an inch. Sheets:—243 Oranienburg, 453 Rosenberg i. o. Schles., 477 Oppeln, 525 Simmern, 570 Saarbücken, 585 Château-Salins. Price 1s. 6d. each sheet. (*Dulau.*)

France.—Carte de—, à l'échelle de 1:1,250,000 or 17·1 geographical miles to an inch. Comprenant le Relief du Sol, les Voies de Communication, Chemins de Fer, Routes et Canaux, les Divisions Administratives, etc. Dressée sous la direction de Vivien de Saint-Martin. 4 sheets. Paris, Hachette et C^o., 1884. Price 12s. (*Dulau.*)

This is a beautiful specimen of cartography; all Canals, Railways, Road-, Limit of River Navigation and Departmental Boundaries are given, as well as an inset map of the Environs of Paris.

Great Britain and Ireland.—Map of—, showing the distribution of Political Power and the present Political Representation of the Country. W. & A. K. Johnston, Edinburgh and London. Price 1s.

This map is entirely statistical, and more useful to the politician than the geographer; it contains the populations, number of votes recorded at the last election, and the political party to which its representatives in the House of Commons belong.

Oesterreichisch-Ungarischen Monarchie.—Specialkarte der—. Scale 1:75,000 or 1 geographical mile to an inch. K. k. militär-geografisches Institut, Wien, 1884. Sheets:—Zone 13, Col. XVII. Wartberg und Tallós. Zone 14, Col. XVII. Duna-Szerdahely und Hédervár. Zone 14, Col. XVIII. Neuhäusel und Komorz. Zone 18, Col. XX. Duna-Földvár und Szabadszállás. Zone 18, Col. XXVIII. Bánffy-Hunyad. Zone 19, Col. XIX. Pincehely. Zone 19, Col. XXI. Pest-Vadkert. Zone 19, Col. XXII. Félegyháza und Szegvár. Zone 20, Col. XX. Hajós. Zone 20, Col. XXI. Halas. Zone 21, Col. XX. Baja. Zone 21, Col. XXII. Török-Kanizsa. Zone 21, Col. XXIII. Makó und Nagy-Szt. Miklós. Zone 21, Col. XXIV. Alt Arad und Perjámos. Zone 21, Col. XXV. Lippra. Zone 21, Col. XXVI. Nádas und Soborsin. Zone 21, Col. XXVIII. Zalatna. Zone 22, Col. XXI. Bajmak und Topolya. Zone 22, Col. XXV. Rékás. Zone 22, Col. XXVI. Facset. Zone 22, Col. XXVII. Maros-Illye. Zone 23, Col. XXI. Uj-(Nen)-Verbász. Zone 23, Col. XXV. Buziás. Zone 24, Col. XXIV. Detta. Zone 26, Col. XXVI. Bozovics. Zone 28, Col. XII. Pago. Price 1s. 4d. each sheet. (*Dulau.*)

— — Post- und Eisenbahn-Karte herausgegeben vom Post-Cours-Bureau d. K. K. Handels-ministeriums. Neubearbeitet vom Controlor W. Krauss und von den Officialen J. Broditzky und W. Eisner. Scale 1:570,000 or 7·8 geographical miles to an inch. Wien, Waldheim, 16 sheets. Price 12s. (*Dulau.*)

Schweiz.—Relief-Karte der—, von R. Leuzinger. Scale 1:530,000 or 7·2 geographical miles to an inch. J. Wurster & Co., Zurich. Price 3s. 6d. (*Stanford.*)

This map very clearly shows the physical features of Switzerland, the elevations are shown by contour lines for every change in height of 100 metres, the contour representing each 500 metres increase in altitude is indicated by

a dotted line. A scale of shading, and the height corresponding to each shade is also given, so that the approximate altitudes may be seen at a glance.

As this map has been drawn for the special purpose of illustrating physical features, it has no names of places, which would indeed mar the effect of the very beautiful hill work it contains, and which is so good that the map answers all the purpose of a model without the exaggeration of vertical scale, so objectionable in the latter.

Spain.—Südwestl. Teil der Provinz Ciudad-Real mit besonderer Berücksichtigung des Valle de la Alcúdia. Nach unpublicirtem meist officiellem Material construirt von Otto Neussel Geograph. Scale 1:250,000 or 3·4 geographical miles to an inch. Petermann's 'Geographische Mittheilungen,' Jahrgang 1884, Taf. 14. Justus Perthes, Gotha. (*Dulau.*)

Thames.—The Valley of the——. Scale 1:167,904 or 2·3 geographical miles to an inch. Constructed by W. & A. K. Johnston, Edinburgh and London, 1884. Size 50 by 42 inches. Price from 12s. to 18s., according to mounting.

This map, which is a reduction from the Ordnance Survey, includes the following Counties and Parts of Counties:—Essex, Kent, Suffolk, Cambridge, Huntingdon, Bedford, Hertford, Middlesex, Surrey, Sussex, Hants, Wilts, Berkshire, Oxford, Buckingham, Gloucester, Northampton, Warwick, and Worcester.

The River Thames and all its Tributaries are printed in blue, and a red line shows the limits of the Basin of the Thames.

All Railways and Heights, and Rivers outside the Valley are printed in black.

Torino Cuorgne, Torre Pellice, Chivasso, Moncenisio, Carta dei Dintorni di——. Secondo le più recenti pubblicazioni dello Stato Maggiore, del Club Alpino Italiano e studi speciali fatti in varie località, coll' indicazione delle Ferrovie, Tramvie, Strade nazionali, provinciali, comunali ecc. Disegnata da G. E. Fritzsche. Esequita nell' Istituto Cartografico Italiano in Roma. Dedicata alla memoria del suo fondatore Giuseppe Pomba dalla Unione Tipografico-Editrice. Firenze. Roma, Torino, Napoli, Catania, 1884. Scale 1:100,000 or 1·3 geographical miles to an inch. (*Dulau.*)

ORDNANCE SURVEY MAPS.

Publications issued from 1st to 31st July, 1884.

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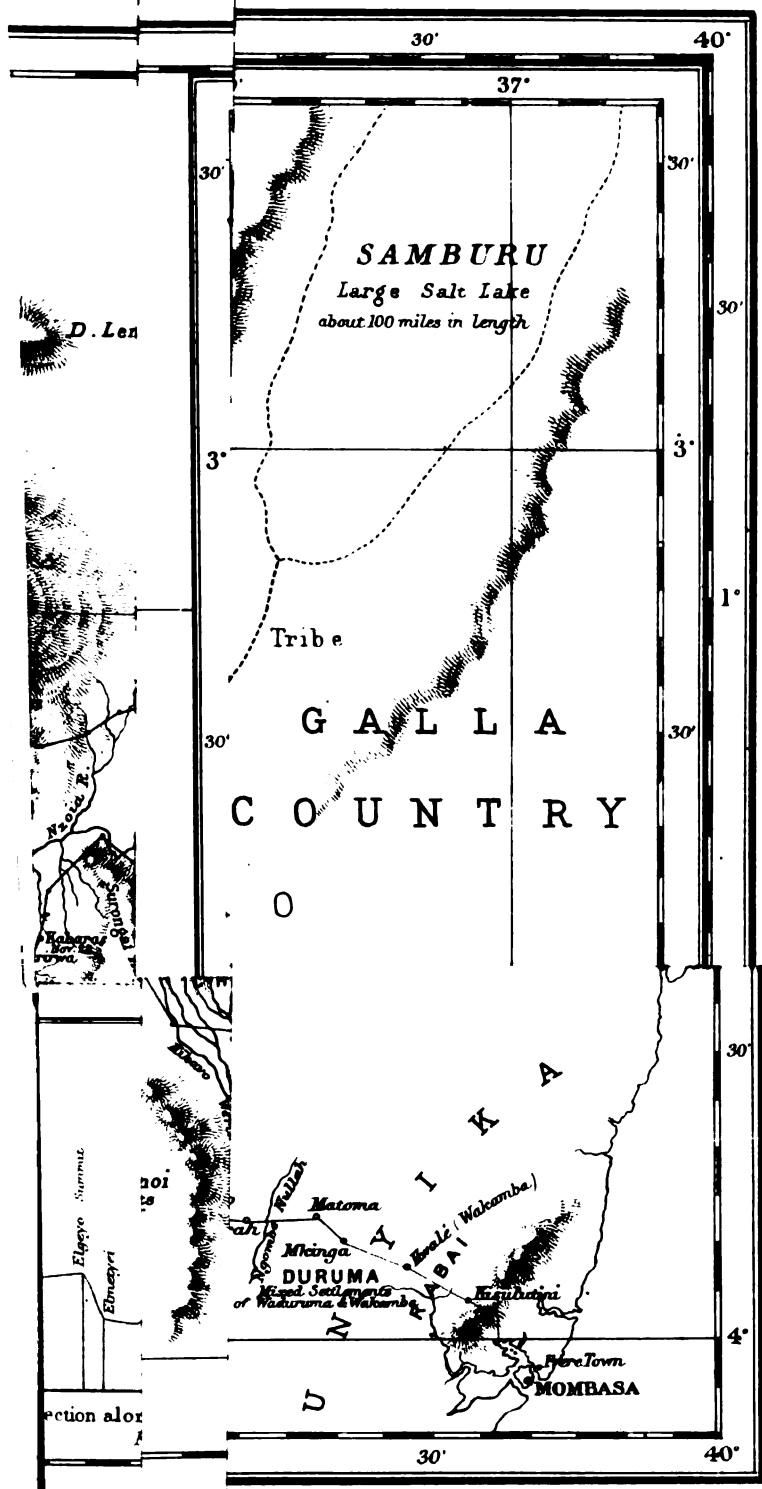
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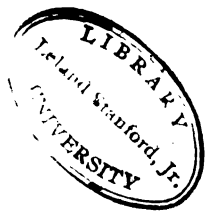
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* Vide Erratum, p. 744, with respect to the position of Bousa on the Niger.

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