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ART. I.—*Memoir on the Climate, Soil, Produce, and Husbandry of Afghanistan and the Neighbouring Countries.—By Lieut.* IRWIN.[1]

PART I.—OF CLIMATE.

SECTION I.—*Of Temperature.*

48. Even the most northerly parts of these countries lie in latitudes considered warm in Europe. But it is sufficiently known that latitude alone does not decide the temperature of countries. In the same parallel of latitude in the Russian empire the heat is less as the eastern longitude is greater. The causes of this difference seem yet unassigned, and until they be both assigned in a satisfactory manner, and shewn to be common to the southern parts of Europe and Asia in the same longitudes, there is but slight ground for concluding *a priori* the fact to be similar in them. The influence of altitude however on the temperature of place is undeniable, and exemplified in many familiar instances. Nor can it be denied, that the greater or less frequency and severity of rains must affect the heat of a place. Other causes might also be mentioned, for instance, the course of the winds. Distinct also from those which influence the annual heat of any place, there are causes which affect the equability of heat during the succession of the seasons. Maritime places have a temperature more uniform than inland. Even considerable inland lakes communicate a more equable temperature to their banks. The effects are the same of moisture in the soil. Countries whose surface is chiefly formed of sand or stones have more

1 Continued from p. 776.

rigorous winters and more sultry summers than others in similar circumstances. The periods of the rains, the course of the winds, and perhaps some other circumstances, are to be weighed when a theory is to be given of the phenomena. I here content myself with detailing facts as far as known, with occasional reference to probable causes.

49. From Delhi to Peshawur, by the royal road which conducts through Lodhiana, Umrutsir, and Rohtak, the heat of the climate as estimated by that of all the seasons of the year, generally speaking, gradually diminishes. Even at Lodhiana, it is said, few nights are known in the season of greatest sultriness which have the oppressive heat of those sometimes experienced in our provinces. Whenever the road conducts near the great northern mountains, unusual coolness is experienced; but the neighbourhood of inferior hills seems in the summer at least to increase the heat. To this cause, and to the scantiness of the summer rains, we may attribute the sultriness of Peshawur in the midsummer. All the natives agreed in representing the summer of 1809, which was partly passed there by the Embassy, as unusually cool. Yet the heat by day, of the weather in May and part of June was considerable, and was on the increase when we left that place on the 12th of June. No relief is in ordinary years to be expected until the month of July, when either showers fall or the air is cooled by winds from the east, in which quarter the rains have commenced. Hence June may be concluded a warmer, or at least as warm a month as in Delhi. If the summer of 1809 be not supposed altogether singular, the nights in Peshawur are seldom disagreeably warm to those who avoid sleeping within the houses, and prefer the terraces. The summer too is of later commencement, and declines sooner than ours. The whole of the month of March may be excluded from it. The Hinduwee month Ussoo or Koonar, beginning on an average on the 13th September, is there called the first-born of the winter, an epithet it by no means deserves in our provinces, in which September is often warmer than August;—add to this, that the winter season is severer in Peshawur than here. Old persons remember a fall of snow, which, however, they acknowledge instantly melted. Frost is very frequently experienced in every season. On the whole then, it cannot be doubted that the annual heat is less in Peshawur than in any part of the Bengal provinces, except the skirts of the great northern hills. In this and many other cases we should be deceived were we to build conclusions on the proverbial expressions of the country, without inquiring by whom, and on a comparison with what, they are spoken. To the Afghans of the hills, Peshawur may seem

the seat of the most intolerable heat, because situated not far from temperate climates, and still the annual heat be under that of Delhi.

50. Bajour and Punjkora are considerably cooler in summer and colder in winter than Peshawur; a winter does not pass without a fall of snow, which is perhaps not melted in less than two days, sometimes a much longer space. Even in Koonar snow falls, though it soon melts except in the shade. Lughman is warmer in a small degree than Koonar, and Jellalabad than Lughman. These positions are to be understood of the plains only of these countries; the hills and mountains are cooler than they, and in a degree proportionate to their height. But during the summer there is generated the most excessive heat among the low hills of the Turnkzy tribe of the upper Mihmunds, which from their bareness and dryness are commonly called the Bedoulut hills. Kohat is supposed to be a little cooler than Peshawur, and Malgeen is probably of a temperature the same as that of Kohat. Bunnoo and Eesa-Khel cannot be very different. The plains of Chhuchh-Huzara and Pukhlee are probably a little cooler than that part of the plain of Peshawur in which the city is situated. Moozufferabad is cooler than they, but is still to be pronounced a warm climate. Snow falls in Khanpoor of the Gukhurs. The more southern parts of this Doab are warmer.

51. The nether part of the Punjab, which includes Mooltan, is far warmer than the upper, and that for several reasons—a lower latitude, rains much more scanty, and the greater distance of cold mountains. The winter in Mooltan seems severer than in our provinces, and as in Bengal is accompanied with mists. The summer-heat, on the other hand, is probably greater. Mooltan, Seeweestan, and the Daman, are proverbial for heat. The nether Sindh is perhaps cooler, although situated more to the south, because it has more abundant rains. Its summer is certainly far cooler, being moderated by the neighbourhood of the sea; but, on the other hand, the same circumstance abates the cold of its winter. Notwithstanding its lowness, and probably moisture, the climate is much commended, especially in the southern parts. The country of Kuchh and the coasts of Bulochistan have a similar climate, neither hot in summer nor cold in winter. Kirachee is represented as unhealthy. The interior of Bulochistan is in general a hot country, but when the hills rise to a considerable height the climate becomes temperate. In Kilat snow lies on the ground during the greater part of winter; the summer however is warm. There are some inhabited places even colder than this in Bulochistan, on the whole however that country must be described as a warm one.

52. Cabul must be reckoned a temperate, perhaps a cold climate. In the three signs of the zodiac, Sagittarius, Capricornus, and Aquarius, the snow lies in the neighbourhood of the city. In Pisces it melts in the low and frequented places, but remains in the higher and less frequented. In this month are copious falls of rain, sleet, and snow. The first day of the ensuing sign of Aries is the vernal equinox, by the Persians and the people of these countries called Nouraz, because with it the natural year is considered as commencing. In Persia especially it is celebrated with much joy and festivity. In this month whatever remains of the snow melts in the plains. The summer which now succeeds is so temperate that the heat in the shade is never disagreeable, and no night is so warm as that a thick covering can be dispensed with. But the heat of the summer's day must be greater and steadier than in England, since rice and maize ripen in this district. The heat of the mid-day sun is indeed described as very great, and equally disagreeable as in the warm climate of Peshawur, where though the heat be unquestionably greater, its effects on the feelings and constitution are moderated by a more copious perspiration. The fact is to be accounted for, not by supposing the atmosphere of Cabul a moist one, for on the contrary the air of high places is usually dry, but by the difference of temperature. A temperature uniformly high, both in the sun and shade, in Peshawur keeps open the pores, which thus admit of a perspiration which relieves the body, but in Cabul they are kept shut by the coolness of the air in the shade. Cabul although warmer in the summer than England, is probably colder in winter. This we are to attribute to a situation more inland, and a sky less overcast; for it is certain that clouds moderate both heat and cold, as indicated by the thermometer. The climate is on the whole good, but is more commended by the opulent than the poor, of whom many leave the district in the winter for the warmer ones to the east, induced by the severity of the cold, the scarcity of fuel, and the difficulty of obtaining employment and wages in that season.

53. The valley of Cabul itself is diversified with inequalities of surface and varieties of exposure, and the neighbouring districts still more so. The temperature varies accordingly often within short distances, and it is impossible to give accounts more than generally true. The Kohdamun is colder than the immediate vicinity of Cabul, or the eastern part of the valley. The Kohistan and Ghorbund are colder than the Kohdamun. The summer heat of Ghorbund is said to be distressing to the Huzaras of the neighbouring hills. We have

seen that the Huzara mountains are not of the greatest height, but the cultivated and inhabited valleys being little beneath the level of the mountains are remarkable for their cold. In some of them the wheat harvest is scarcely completed in September. Some of those which open towards Bactria are warmer than Cabul, and the cotton plant is cultivated with advantage. In Cabul it may be and is raised, but the produce is little. Ghuznee and all the places situated on that high plain are noted for cold. That city is said to have been buried in snow nine days after the vernal equinox, yet I apprehend the real cold is not very different from that of Cabul, since the operations of agriculture and the harvest are but a few days later. To the feelings the cold of Ghuznee is made more sensible because of the want of shelter in the country. Mookr and Kura-Bagh are warmer than Cabul, and from Ghuznee to Candahar the temperature increases every stage.

54. Kushmeer is like Cabul a high valley, and in latitude somewhat more northerly. It is certain the winter is milder both in reality and to the feelings. The same periods are indeed assigned to it, and the snow lies during the same month, but it does not possess that cold felt in Cabul. The natives with no other protection to their feet than sandals of rice-straw travel in it without apprehension, and even in the depth of winter pass the heights which separate their valley from Kishtwar and its other dependencies to the south. Instances are rare of their losing their toes or fingers by the frost, but this is no uncommon occurrence to travellers in the countries of Cabul and Ghuznee. The wolf of Kushmeer has not that ferocity which he possesses in the severer winter of the last mentioned quarters. It is true the Vidusta is sometimes frozen over, whereas the river of Cabul after the junction of the Ghorbund stream never is; but a sufficient cause of this difference is seen in its greater rapidity. The summer of Kushmeer is probably of the same temperature as that of Cabul, but it is oftener cooled by showers. The complexion of the natives, which is usually a yellowish sallow, seems to indicate a climate on the whole warmer than Cabul. The Cabulies descended of families long established in their valley, are nearly as fair as Englishmen. To the feelings it is certain Cabul has the colder air, by reason of its breezy climate, while Kushmeer is a still climate.

55. It would be a tedious task (even were it possible) to particularize the temperatures of the various inhabited places among the mountains and hills already enumerated. They may often be conjectured to a considerable degree of accuracy by adverting to some circumstan-

ces formerly detailed—the height of the hills, their character, whether steep or tame, and that of their valleys, whether deep and narrow, or the contrary. Slopes and plains even of moderately high hills have a cool and healthy air, but deep vales in the bosom of even the highest mountains have a hot summer, rendered still more disagreeable by stagnation of air, yet even they are warm only in comparison with their immediate neighbourhood. Of this class is the valley of Chitrul, so called from a town situated on the Kashkar river, and the capital of one of the four principalities of that country, (see paragraph 17.) The numerous valleys of Swad, Bhooner, and Pukhlee are warm, as is that of Khost, comprehended in the revenue division of Bunnoo, from which it lies in a westerly direction, in the bosom of the range of 32½°. The valley of Jajee is as cold as Cabul, that of Toree is warmer. Teera situated on the range of 34°, Oorgoon on that of 32½°, parts of upper Bungush, and the valleys in the Jadran range are somewhat warmer than Cabul. Zhob, in the Kakur country, is much warmer than Cabul, but much colder than Candahar. Even Pushing, or as the Afghans call it Psheen, the country of the Tureens, is somewhat cooler than Candahar; but Shorabuk, or the country of the Bureches, is of the same temperature.

56. The country of the Dooranees considered as a whole, is of a temperature intermediate between Cabul and Peshawur, but exhibits considerable diversities within its own extent. Teeree, inhabited partly by Huzaras partly by Dooranees, is a cold place, falling not much short of the warmer parts of Cabul. The country called Zumeendawur, lying on the right of the Helbund in its further progress (see para. 41) is a temperate one. No winter there passes without snow, but to it succeeds the *gurm seer* (so called even in Tamerlane's time) in which there falls no snow. It lies WSW. of Candahar, which is only a little cooler. In some winters snow falls there, but it soon melts. The intensity of the summer heat is however moderated by western and northern breezes, and close nights are quite unknown. Few towns are more healthy than Candahar. Furah, although in a latitude somewhat higher, is warmer than Candahar; Subzwar, or Isfazar of the Zooree tribe, is much cooler, by reason of its being situated on high land. Hirat is still cooler, and is probably not very different from Bokhara, to be afterwards mentioned. Still colder are the vallies of the Ymaks, which are yet far more temperate than those of the Huzaras, and generally speaking similar to Cabul. In Muro snow lies but a short time after falling. Toorshish is in a temperature perhaps the same as Hirat, and

Mushhud is considerably colder than both. Mushhud and Kilat of the Beéloches may be conjectured to have an animal heat not very different. Ghaeen and Birjund are various in different places, but generally may be pronounced intermediate between Hirat and Candahar. Seestan is warmer than the *gurm seer*, yet contains hills on which snow falls in the winter. The great desert to the south has a most sultry climate.

57. Snow falls every winter in the whole of Toorkistan, unless indeed there be any exception in the deserts towards the Caspian, of which our information is in most particulars very scanty. This country sloping westward, the eastern quarters are the coldest; but in the distance of a few miles there is frequently great differences of climate. It also deserves remark, that the kingdom of Bokhara and other parts west, being open countries, are also windy, and their air sharper to the feelings in the winter than that of the east. But no doubt exists of their real cold being less, for their winter is shorter, and the snow sooner melts. In Bokhara it seldom rains, but snows in the sign Sagittarius, which begins the 20th November. Snow falls knee deep in the course of the ensuing month Capricornus, and that quantity melts in five days. In some years there happens much greater falls, and it has been known to snow after the vernal equinox. The spring and autumn are generally temperate, and two months only of the summer are hot, namely Cancer, which begins the 20th of June, and Leo, but especially the former; the noonday winds then feel warm, but close nights are not known. The natives are not so fair as the Cabulies. Khwaruzm is warmer than Bokhara; the kingdom of Kokur is colder, and has both a healthier and pleasanter climate, though Bokhara cannot be said to be unhealthy. Taskund is nearly similar. The Kinghuzes live in a colder country than the Kuzzaks, whose country is yet colder than Bokhara, and not much warmer than Taskund, which borders on it to the east. Keerategin is a cold country, but some places are much colder than others. The town of Durwaz is noted in its own neighbourhood for heat, being situated in a deep and narrow valley.

58. Budukhshan being composed of vallies which take their origin in mountains covered with perpetual snow, and whose months have nearly the same level as the lower parts of Toorkistan, thus possesses great diversity of climate. In many of the loftier parts the crops are in some seasons spoiled by the frosts before ripening. All the considerable places, however, lie in temperate climates. Fyzabad is warmer than Cabul. The Koocha is not known to freeze at that town or

below it. The river of Koonduz, in a far warmer country, freezes every year so as to admit of horses passing it, but its current is more sluggish. In Bactria there is considerable diversity of climate, arising from circumstances already mentioned (see para. 19.) The climate of Bulkh is perhaps the warmest; summer and winter succeed one another by a very rapid transition, and both are severe. These circumstances coupled with the moisture of the air, render the place neither healthy nor agreeable, and the natives of Cabul had the greatest aversion to serving in Bulkh when that place was in reality, as now it is in name, under their monarchy; many of its villages, however, are healthy. Koonduz though low, moist, and warm like Bulkh is yet more healthy. The districts to the south and east are colder in various degrees. The lower part of the valley of Khost is warm, and no place in Bactria is so cold as Cabul. Shibirghan, Undukho, Mymuna, and Kuburmach are healthy, and their temperature somewhat less than that of Bulkh.

59. Chinese Toorkistan although in general more northerly than independent Toorkistan, has not a colder climate, but rather the contrary, for the inhabited places are for the most part in low plains. Kashghur is colder than Yarkund. The temperature very gradually declines as we proceed to the more northern parts. The Pamer is exceedingly cold, yet may be crossed in autumn. With the exception of Chitrul, already mentioned (see paragraph 55.) Kashkar is undoubtedly a cold country, but to what degree we cannot yet tell. All the Tibets have rigorous climates, considerably colder than Cabul, even in the cultivated vallies. Between the Tibets and Hindoostan, the Punjab and other countries to the south and south-west, there is every degree of temperature, from mountains clad in never melting snow, to low and sultry plains.

Section II.—*Of Winds.*

60. In most countries it requires the observation of many years to determine what winds on the whole are predominant, and in what seasons of the year; we are otherwise in danger of stating local and temporary phenomena as general and constant. In the total want, in the present case, of such records, and under the necessity, moreover, of relying on the testimony or rather opinion of others, who may not have considered the subject with the patience it requires, it must be expected that the present account shall be meagre, perhaps in many points erroneous.

61. Some facts however seem to be established on sufficient evidence. It may be asserted that in the whole of Toorkistan, Budukhshan, and the north in general, the prevailing wind is from the north. In Bokhara it blows with considerable violence in the signs Cancer, Leo, and Virgo; after three months cessation, it recommences, and blows, though with less vehemence, during Capricornus, Aquarius, and Pisces. These may with propriety be called midsummer and midwinter winds. The former are sometimes felt warm by day in Bokhara, the latter, when strong, are felt piercingly cold. Both vary from time to time in strength, blowing for seven to ten days with violence, and then remitting for nearly an equal time. In the wide space in which this northerly current prevails it may be supposed to have considerable variations in its direction, (for it need not be supposed to be always due north) strength, and other circumstances. It is not constant and strong in the west of Toorkistan, but it has occasionally given melancholy proofs of its power. It has submerged under sand the far greater part of the kingdom of Khwaruzm, and yearly curtails the habitable lands of Bokhara. The same evil consequences are not apprehended from the north winds in the quarter of Bulkh, yet even there they occasionally blow with great vehemence. In the war which Tymoor Shah waged in that country with the Oozbuks, there were six successive days in which these winds suspended all hostile operations. Budukhshan, except in some particular situations, has a still climate, by reason of the shelter afforded by its lofty mountains, and is not so breezy as even Cabul; the north winds however are there also the prevalent ones, though much diminished in their strength. It deserves remark, that the Persian word 'Shimal,' which properly means 'the north,' is in Toorkistan, Budukhshan, and the north in general familiarly understood by the signification of wind. In the Persian Gulph, the same denotes a blast. It is remarked in Bokhara that the south-east wind there, called 'Kypung,' is productive of great warmth, and when it occurs in the spring, the snow rapidly disappears.

62. If we pass from Toorkistan to Khoorasan we still find the same northern current to prevail in the western parts of that province—little change takes place in its direction, and even at Hirat it seems to be from nearly due north, but in longitudes more easterly its direct progress is opposed by the Paraparnisan mountains, which shelter that part of Khoorasan which lies to the south of them. At a moderate distance however from these mountains the current seems to recommence, though with diminished force and altered direction. It now inclines to the east of south, or even blows due east, as if to reach

the Afghan Khoorasan, it had been compelled to travel round the western end of the Paraparnisan range. In Candahar the direction of the midsummer winds is perhaps from the north-west, but at a considerable distance south from the Paraparnisan mountains the current resumes its force, and perhaps nearly returns to its former direction. In Seestan such is its force, that it has heaped up the sands of that country into waves; not a season passes but whole villages are buried under the sand, the inhabitants escaping with little beyond their lives, yet do they deem these winds a blessing. They moderate the heat, relieve them at times from the musquitos, and they turn their windmills. At Kilat of the Beeloches the midsummer winds are from the north, for this place is situated too far to the south to be effected by the Paraparnisan mountains.

63. Hirat lies open to the north, and if we except Seestan there is no part of Khoorasan where these winds blow with such vehemence as in its neighbourhood. It has a windy season of 120 days, which returns with such certainty, that relying on it they here use no watermills, but windmills only. These periodical winds seem to commence earlier in Hirat than in Bokhara, and in Seestan earlier still. In that part of Khoorasan which lies west of Hirat the summer winds though of considerable strength and regularity, are not relied on for grinding the whole of the crops, on the contrary watermills are commoner than windmills; in former times the latter were more used than now, as is proved by the ruins to be seen in the districts of Cabul, Muro, Zumundawur, in certain parts of the table land of Ghuznee, and other quarters where watermills only are now employed. This change of practice may have arisen from a change of opinion, watermills having been found more eligible in all but the most windy climates, as being oftener at command than the others; or it may be considered as one proof of what all the natives assert, that the seasons and weather have altered from what they were in former times.

64. I know not how far southward we can trace these northern and north-western winds, but in the eastern longitudes at least they do not extend to the Ocean. The wind there on the contrary, blows from the south during the greater part of summer. We can trace this wind as far as Buhawulpoor, in latitude 29° 22′, and perhaps a good deal further. This southerly wind blowing from the ocean, communicates to the climate of the nether Sindh an agreeable coolness. At Mooltan it shews itself rather in occasional blasts, than a constant current. By parity of reason these southerly winds may be supposed to extend a certain distance (varying in different longitudes with cir-

cumstances) from the ocean into Bulochistan. But we have already seen (paragraph 62) that it does not reach Kilat, the latitude of which is not very different from that of Mooltan. In Jodhpoor it is said the west or north-west wind is the commonest in the spring and summer months, until the commencement of the periodical rains. In the upper Punjab also the winds are represented as being in the various seasons not very different from those of our Upper Provinces. In both countries clouds seem to assemble from easterly points (especially in the rainy season) and winds from westerly points shed their contents.

65. The winter of 1808-9 was spent by the Cabul Mission chiefly at Beekaneer, between that place and the entrance into the hills beyond the Indus. It was remarked as being singularly still; and generally it may be asserted, that in all these countries the winter is calmer than the summer, the night also is usually calmer than the day. Travellers tell us that such is the cold of the Pamer in the autumn—the season in which it is most commonly passed—that did not the wind die away by night, this route would not be practicable. As before observed the mid winds of Toorkistan are not so strong as the midsummer, and in Khoorasan they are not always traceable. In Candahar, and some other situations, the month of October is more remarked as windy, than the depth of winter. The cold winds of that month, or rather of the sign Scorpio, which begins the 20th of October, strip the trees of their foliage. The same sign of the zodiac is windy in our Upper Provinces and in Peshawur, and in both cases it blows from a westerly point. In Cabul also this season is generally windy, as also in the sign Pisces.

66. Cabul however though at most seasons breezy, is in none remarkably windy, the north and west winds chiefly prevail. The same positions are, I presume, true of Ghuznee, which, however, has less shelter. Kushmeer has been already mentioned as possessing a still climate. The stagnation of air is sometimes very disagreeable, especially to those who have been accustomed to the free circulation in Khoorasan. Other places there are remarkable for continual wind, a circumstance owing to their situation between hills, which by confining the current of air accelerates it. Such is Jummoo, built not far from the left of the Chunab, and some other places of less note. Jellalabad and Koonur have never-ceasing winds, chiefly from the west. These threaten to bury under sand the good lands of the former. In Peshawur and Bajour the prevailing wind during the whole of the summer is said to be the east, and the observations made during the stay of

the embassy in that country correspond to this opinion. In the winter the chief winds in Jellalabad, Koonur, Bajour, and Peshawur, is the west, and next to it the north, which in Bajour is in that season productive of great cold. In Peshawur and Bajour, as in our provinces, are occasional blasts during the spring and summer months; in the former place they blow from the west and south-west.

67. Even in Bokhara hot winds are known, but they are confined to a few weeks in the year, and a few hours in the day, and altogether are little regarded. This is equally true of those in Hirat, but the hot winds of Seestan are severe. Those of Peshawur have been already mentioned (see paragraph 49.) Jellalabad, which on the whole has a cooler climate, has severer hot winds than Peshawur, because of its lying to the west, or leeward of the Bedoulut hills (see paragraph 50.) The wind from them is moderated in its bad qualities before it reaches the city of Jellalabad. Within the tract in which it is generated it is a true Simoom or pestilential wind, and many instances are given of its proving fatal to travellers. On the night of the 21st June, the Cabul Mission experienced a wind of the most intolerable heat; it blew from the low hills on which Attock is situated, then bearing south. The hottest winds appear to proceed from, or blow over, low hills, whose rocks and stones acquire a higher temperature than the soil of the plains. In the warm parts of Bulochistan, hot winds of very great severity blow. Instances are few of their proving fatal, but not unfrequently they scorch the shoulders and backs of travellers.

Section III.—*Of the Rains.*

68. In India from the northern mountains to Cape Comorin, the grand rains are those which beginning about midsummer, continue to the middle or end of autumn. The monsoon of the Coromandel Coast forms an exception, caused by peculiar circumstances. The rains, so called by way of eminence, on an average of seasons begin in Calcutta in the first week of June, in Futthgurh about the 20th of that month, and in the intermediate situations they are later, according as the place is situated more or less to the west of Calcutta. This rule is true in a majority of places and seasons. In our progress westward, it is also found that the rains are more scanty. The annual inches of water in Calcutta, are thrice those in Delhi. It is only in the lower parts of Bengal, that in the same season rains fall in the four successive Hinduwee months, Usarh, Sawun, Bhador, Koonar, of

which the first begins about the 13th of June ; far less can four months be counted in the Upper Provinces between the first and the last shower. Yet is ' Chowmasa' a term for the rains, in the whole of the Bengal provinces. The rains of the first and fourth month are more scanty and uncertain than of the second and third. The second again is more rainy than the third, and its rains more seldom fail ; it begins about the 13th of July. Places in the same longitude have more or less rain, according to their proximity to the great northern hills. This rule, however, does not extend to all places, for those which are near hills of considerable height within India itself, receive from that circumstance more copious rains. It is thus the province of Kuttack is more rainy than even the neighbourhood of Calcutta. Very many places in the Marhatta territories and the Dukhan are far more rainy than those in corresponding longitudes within our Upper Provinces. When other circumstances are equal, the number of inches of water which fall in the year diminishes in proportion as we recede from the sea. Hence Jodhpoor and Oodeepoor have more rains than Beekaneer or Jypoor.

69. The rains of Hindoostan extend to certain points in these countries, and their periods and quantities are according to the laws just mentioned. The rains of Lahour are later, and less than those of Delhi. Those of Pothwar are still more so, and only the two middle months are relied on. One heavy shower in the month of September is of the utmost importance to their crops, but in some years is longed for in vain. In Peshawur only the second month of the rains remains ; nay, some seasons pass in which all are denied. The husbandman, however, sows in expectation of the rain of Sawun. From Peshawur we trace the rains to a termination in Lughman and Jellalabad, where they dwindle to a few showers. It thus appears that they diminish in our progress westward. But this rule is modified by others. Pukhlee, upper Sward, Punjkora, and Bajour, of which the two last are more west in longitude than Peshawur, have, as being hilly or near hills, much more rain than that place. Kushmeer lying to the east of all these has yet but a few showers, for the mountains to the south shut out the rains in this quarter, though we find by Captain Turner's account, that they have not this effect in the part of Tibet he visited. Barah-Moola, lying in the narrow pass leading to Kushmeer from the west, not only has a portion of the great rains, but showers in all the months in the year. Teera enjoys the four months of rain, but the showers are light. It is even said that it rains every day of the year in some part of the plains or the vallies of Teera. To the north the

great chain of mountains does not allow the rains to fall in Kashkur, but the country of the Kafeis has an equal share with Bajour.

70. We have thus traced the summer rains in the high latitudes. In the middle latitudes they extend to all the sources of the river Koorm, being here diminished in duration to less than one month. These showers are generally severe, and important to the agriculture of the country. By the Afghans they are called, 'Vuse,' a term plainly of Indian origin. In latitudes still more southerly it is difficult to lay down the limits. The 'Vuse' certainly does not reach Candahar, but is sufficiently regular at Zhob of the Kakurs. It is said to reach Kilat of the Beeloches, but is not there the chief rain. Nay, it is by one person asserted to be known as far west as Punjgoor. This is rendered incredible by adverting that that place is not very distant from the sea. Natives of Persia assure us that in most seasons there is a heavy fall of rain in the month of August in the province of Laristan; and I presume this is equally true of the coast of Kirman. It is probably the neighbourhood of the sea which gives to lower Sindh a rainy season of greater length than the upper, and perhaps not greatly inferior to that of the upper Punjab, yet has it been known in some years to fail, but the circumstance is of little importance to agriculture. Mooltan, distant at once from the sea and from the mountains, has very little remaining of the rains, less than any part, it is probable, of Sindh or Seeweestan, or the Daman and Makalwad, though lying to the west. Buhwulpoor has more rain than Mooltan. The rains of Beekaneer are somewhat uncertain and scanty, for a country situated on this side the desert. Showers sometimes fall in Seestan during the summer, but they are unconnected with the rains of India.

71. In the Bengal provinces next in importance to the grand summer rains, are the showers which fall in the winter. By the natives this rain is called 'Muhawut,' because the greater part fall in the Hinduwee month Magh, which on an average of seasons begins on the 13th of January. The farmers in what is called the Puharturee, or the tract of country lying at the foot of the great northern mountains, do not even water their rubbee crops, but trust to this rain, which however in some years fails, even there and in many parts of the plains more distant from the hills. The Muhawut extends from our provinces as far as Jodhpoor; but with respect to many parts of India I do not possess information as to whether it occurs or not. Part of the rainy monsoon of the Coromandel Coast coincides in time with it, but far exceeds it in quantity and importance. In the season 1808-9 it failed in our Upper Provinces in general, a circumstance productive of great

loss to the former. Neither did it occur in or near any place where the Mission was, that is between Beekaneer and Dera-Ismael Khan, but in those latter countries the want of it is productive of little or no inconvenience.

72. In the same season it fell abundantly in Peshawur, a province where a great proportion of the rubbee depends upon it; and all the countries now treated of, with the exception to be mentioned, enjoy it with tolerable regularity. It falls according to circumstances in the form of rain, sleet, or snow; and with respect to the time it may be expected, the chief showers are (as in England) rather in the second than the first half of winter. Although the time varies in different years, it is seldom that it fails altogether. The consequence of such a failure is dearth, sometimes famine. Where it used to fall as rain, the crops die from drought, or are killed by the severity of the frost that usually accompanies dry winters; where it used to fall as snow, the crops wanting this protection are exposed to the frost, and the hopes of the spring which partly rested on the melting of the snows in the hills are disappointed. There is a favorite proverb in Cabul, "let Cabul be filled with snow rather than gold." The quantity which falls is very various, according to season and places. The highest and most mountainous places appear to receive most, but this rule alone does not comprehend all cases. In Cabul the number of snowy days in the three months of winter is computed at sixteen. If we may form any judgment from the hints given us in Forster's Journal, this is more than occurs in Khoorasan. In the Punjab this rain is certainly of much inferior importance, perhaps it is of inferior amount, and less certain in its periodical return. But that quarter where it is most uncertain and most insignificant, is the same in which the summer rains are so scanty, and in which the Mission spent the depth of the winter 1808-9 (see paragraphs 70 and 71) being Mooltan, and a certain distance around it. In the Daman this rain is sufficiently regular, and of great importance. In nether Sindh, although of very little importance, it falls in most years. It may be observed that it extends far beyond the limits of the present field, to the Hellespont and the Russian frontier. The same is the chief rain in the north-west of Arabia. In none of the intermediate countries, whether cold or warm, is it lost. It is said to be but scanty in Yarkund, but with respect to many other parts of Chinese Toorkistan we possess little information on this, or most other particulars.

73. The third rain we may distinguish, is that of the spring. It is perhaps the most important of the whole in the countries lying west

of the Indoor, north of its sources; in all of which it is confidently expected, and fails only in the most calamitous seasons or peculiar situations. In the neighbourhood of Candahar indeed, and the country of the Tureens, it is said to be but scanty, and little rain is looked for after the vernal equinox. The falls of snow and rain in the winter are in these places their chief dependance for the success of such crops as are not artificially watered. The spring falls are not confined to the countries under our view, but north and west, extend to the east coast of Arabia, a part at least of Syria, the Hellespont and Euxine, and the Russian frontiers; towards India we find them tolerably regular in the middle and lower Sindh, but in the latter they are the less regarded, as they are of little use to agriculture, and in quantity inferior to those of the summer. In the upper Sindh and in Mooltan respectively, the summer and spring rains are perhaps equal. In the year 1809, some considerable spring showers fell in Mooltan, but in ordinary seasons this, like the preceding rains, is there but scanty and uncertain. In Peshawur, Kohat, Malgun, Fesakhel, and Bunnoo the spring is the chief rain of the year, the same is true of Chhuchh, Huzara, Kushmeer, and perhaps Bukhlee, but in Pothwar it is exceeded by the summer rain. We have seen that the latter diminishes as we proceed westwards. The spring rains, on the contrary, diminish as we proceed eastwards from Peshawur. This law however is modified by others; and those of Kushmeer, as being a country embosomed in hills, are more abundant than those of Peshawur. It is difficult to fix the eastern limits of this rain. Within the great northern mountains, and to a certain distance from their foot, it seems to extend in ordinary seasons even to the banks of the Burmphootr, but in the plains of India nothing remains of it but some thunder-storms accompanied with showers.

74. Within the limits in which it is regular it is more or less copious, according to the season and place. Cabul receives more than Peshawur or most parts of Khoorasan, and Fyzabad more than Cabul. In Budukhshan, Durwaz, Keerategin, and the east of Toorkistan it is very abundant, but in Yarkund very scanty. In different places as well as in different seasons, there is some diversity in the season of this rain, but it would be tedious to enumerate instances. In general most rain falls in the month of March, but in some cases the heaviest showers are at the end of February or month of April; rain in the month of May in most of these countries is not to be considered as part of the spring rains, but rather as accidental, and indeed unwelcome. In May 1806, there fell in Cabul a heavy rain which did much damage. Where

fruits are cultivated to a great extent. Rain in the summer is much deprecated, yet in some parts of Toorkistan showers are neither uncommon nor unwelcome even in the end of May. Generally speaking, May is a dry month in the countries under our view. June too is dry, and where the rains of Hindoostan extend, the hottest. The heat declines in August in both descriptions of countries. August is in Peshawur a cloudy month, not a rainy, and is dry in all the countries west of the Indus, as is September. October is a dry month both in India and in these countries. In high and mountainous situations snow begins to fall in November, but the chief showers are in December and January.

75. Dews and mists are often little less important to the husbandman than rains. They do not here attract much attention. They are commonest in the autumnal months, or the beginning of winter, and in the warm countries especially, if well watered and of a humid soil. Mooltan and Sindh to the south, and Peshawur to the north, seem the most noted for mists. The dews of Peshawur in August, September, and October, are said to be heavy. In September the people are induced from fear of the effects of the dews, as well as from the chilliness, to cease sleeping on the terraces. The spring there is more dewy than in Hindoostan. With respect to clouds and overcast weather, the cold countries have more than the warm. The atmosphere of Kushmeer is cloudy during a considerable part of the year; May and June are its most sunny months, but in July, when it begins to rain in the Punjab, the clouds extend to Kushmeer. In the cold countries in general, clouds are observed to gather from the beginning of October, preparatory to the snows, which are to follow.

76. On the whole the vast tract here surveyed must be pronounced to have a dry climate, whether we regard the quantity of moisture which falls in the year, or the number of rainy days. The districts which can be called humid are comparatively few and unimportant; the rains even of our Upper Provinces astonish the natives of Afghanistan. The spring rains are the chief in Peshawur, and the season 1809 was a favorable one, yet were there but seven days of heavy rain, and four of light. It would be difficult to form an accurate scale of the dryness and humidity of the various districts already enumerated, but a conjecture may be formed from the data already given. Khoorasan is on the whole drier than those parts of Afghanistan not included within it, or than Toorkistan. Bulochistan is undoubtedly a dry climate. The west of Toorkistan is far drier than

the east or south-east. Budukhshan, Durwaz, and Keerategin Budukhshan are more humid than Cabul, as is Kushmeer. The humidity of Kushmeer adapts it for the production of rice, which however is there raised chiefly by artificial watering, and ripens in the drier part of the year. The dry and sunny summer of Cabul is favorable to the delicate fruits of the cold and temperate climates, which are here cultivated to a great extent and with much success, but in Kushmeer the apple only can be commended. Within the limits of India there is no place perhaps where less rain falls, and that little so irregular, as the neighbourhood of Mooltan. This however is little regarded by the farmer, who waters his khuruf crop from wells or canals drawn from the river, and raises a proportion of his rubbee on the moist lands which in the cold season the river has abandoned. Nor does the scantiness of the rains imply a dry air. Mists have been already mentioned as common there in the winter.

77. Having now mentioned in succession the altitudes of the mountains and their course, the slope and conformation of the land, the sources of the rivers, the heat of the climates, and the periods and quantities of the rains and snow, we may proceed to deduce from these facts in combination the periods of the rising and falling of the streams and rivers. Few considerations are more important to the farmer and the traveller, or to armies.

78. In perfect plains in a warm climate we rarely find constant streams to originate. The rains of such countries though copious, are violent and of short duration. During the greater part of the year no moisture falls. The rains of the rainy season are drained off with a rapidity corresponding to their violence and their short duration. In their passage they cut deep channels which are dry during other parts of the year; such are very numerous in India, and are by us called dry nullahs. After rain they are always inconvenient to travellers, sometimes dangerous. Where they afford a level higher than the neighbouring ground under tillage, they are not without their use in agriculture, for by a little pains the water they discharge may be turned upon the fields. The Afghans are very sensible of their value, and reckon lands situated so as to be watered from them next to those which can be watered from constant streams, and superior to such as receive no water but what falls on their own surface. A dry nullah is in Pushtoo called '*Khevur*,' and in the Hindhee of Peshawur and the west of the Punjab, '*Kus*.' Even low hills in a warm climate usually give out but temporary streams. The snow which may fall on them soon melts, and the

springs which are found in them do not generally give out water. It is therefore plain that the periods of such streams as may originate in them must be the same as those of the rains and snows of the country; such are often of the greatest importance to the husbandry of a little neighbourhood, but their fame does not pass beyond those bounds. The Swan and Huro alone of this class are deserving of mention. They seem to have no periods distinct from the rains in the country, but their springs are sufficient to preserve them running streams at all seasons until they gain the Indus, whereas most others lose themselves, or are expended on the fields, in all seasons but the rainy, and some do not in any season reach the sea or a river.

79. We every day hear of mountains so lofty as to be covered with never melting snow. The expression construed in strictness would lead to an erroneous conclusion, for, that ice or snow can only remain unmelted which lies in a place whose temperature is never above the freezing point, and few such can be found within the habitable climates. Snow gradually disappears even during a hard frost. Part it is true, is carried off by evaporation, but part also is melted by the heat of the earth. The rivers of Switzerland rise from under glaciers of solid ice. As the inferior snows are gradually melted away, part of the upper also deprived of this support, either gradually slide down the declivities, or fall in avalanches, themselves to be melted in lower and warmer regions. The snow and ice are therefore perennial only because they are supplied from time to time as fast as they are consumed. It is also evident from the same principles, that the fall of snow in winter must in all cases have some tendency to augment the streams, since part is forthwith melted by the heat of the earth. But where these streams originate in hills of considerable altitudes, a far greater part is as it were stored up for a warmer season, and according to the degree of that altitude, and the cold consequent upon it, the season of its melting is later or earlier. While the snows of the low hills are rapidly melting by the warmth and the rains of March, it is at the same time snowing on the high mountains, whose previous stores are as yet unaffected by the weather. The increasing heat at length dissolves them in the order of their altitude, the highest of all melting at midsummer. It is therefore evident that as far as depends on the melting of the snow, streams rising in low hills must be highest in the spring, and streams rising in high hills in the summer; and the periods of the streams would thus be an index of the altitude of their sources. But when a river is fed by the snows of both high and low hills, we

cannot thus decide without adverting to other circumstances. If the low hills be extensive, the flood they occasion may surpass that arising from the melting of the high snows, under which are situated the uppermost sources of the river. If the river be highest in summer, we may decide that it has lofty mountains at its head. This conclusion however is just only when we put out of view the periods of the rains, and decide from those of the thaws only. Both considerations must be combined in our judgment in particular instances, to which we now proceed.

80. The periods of the Indus and the rivers of the Punjab are nearly the same as those of the Ganges and its tributary branches, which are lowest in the winter, rise somewhat in the spring, and are highest in the middle of August. The rise in the great Ganges is perhaps gradual, certain, and nearly of the same quantity in different years; for being fed by many streams one chance and anomoly corrects another, but the same is not true of its branches, including the upper Ganges itself. The annual rise at Hurdwar is six or seven feet; in the lower part of Bengal above the influence of the tide, it is thirty-one. This difference, may I believe, be shewn to be a consequence from the general principles of hydrostatics; it must therefore be supposed to exist in the case of the Indus and its branches, for they also run in a champaign country and yielding soil. My inquiries tend to confirm this opinion. After rains of uncommon severity the rivers of the Punjab sometimes rise to a great height; the effect however is temporary, and many seasons pass in which no such extraordinary floods occur. The great Indus after the junction of the Punjnud is from various causes less affected by local and temporary circumstances, but its regular and annual rise is greater than that of any of its branches. The branches have diversities among themselves not reducible under one general rule, but caused by special circumstances. The Ranee, which is the least of all the rivers, had yet in 1809 a rise equal to any of them. When other circumstances are the same, streams which run in sand increase more in breadth in their flood season, and those which run in clay increase more in depth. The annual rise of the great Indus I reckon about sixteen feet; that of the Ganges is thirty-one; and of the Nile twenty-four. The proportion in which their waters are respectively increased it would be more difficult to estimate. The same causes combine in the raising the Indus and its branches, and the rivers of our provinces—that it both thaws and rains. The effects in this respect are different, in that there is no inundation in the Punjab or Sindh, for we cannot apply that term where the tracts covered

are insignificant in proportion to the whole surface. The character of the Punjab is different from that of Bengal or Egypt. Instead of the banks of the river being higher than the remoter country, the various Doabs usually slope from their interior towards the rivers which bound them. Low tracts are sometimes found, which after heavy rains are covered to some depth with water; but there is no general inundation derived either from rain or from rivers, as in Bengal. The surface of the Punjab, however, after excluding the country beyond the Hydaspes, is lower above the level of its rivers than that of our Upper Provinces in general, with respect to the rivers which run in them.

81. The periods of the Cabul river where it joins the Indus are nearly the same as those of it. It is lowest in the winter, notwithstanding the rains of that season in the valley of Peshawur. It is sensibly affected by the spring rains in February and March. It falls after they have passed over, yet not to its level in the winter, for now the snow of the lesser hills begins to thaw. At the end of May the middle snows begin to descend, and after them the upper, which bring the river to its greatest height at the beginning of August. We are to attribute the effect in part to the rains, which fall at that period at some of its sources (see paragraph 69.) Such is the history of the grand streams, but there is a diversity of circumstances with respect to the branches composing it. The Pech river swells early in spring, and declines from about the 28th of May. The Punjkora river follows nearly the same laws, though indeed heavy rain in the months of July or August will cause it to reach its greatest height in those months. The three streams in the valley of Cabul (see paragraph 36), the Lughman river, the Kashkar, and the Swad, with the rivulets of Jellalabad are highest in the month of July or August. The Bara is on the whole the greatest in the spring, but it rises and falls very suddenly, and very often according to the occurrence or cessation of rain in Teera. The To is probably greatest in spring; the Koorm is greatest in July or August, when it is swelled both by the *Vuse* (see paragraph 70) and by the thawing of the upper snows. The Gomul is perhaps the highest at the same time.

82. The diminutive streams of Bulochistan and Seeweestan are in general highest in the spring. The same is true of those found in the western Khoorasan, the Turmuk, and the little streams of the Kakna, Tureen, and Burch countries. Even those rivers which taking their rise in the Paraparnisan flow into Khoorasan, reach their greatest height during the periodical spring rains. The Helbund only which

rises in the most elevated part of that ridge continues to increase after that period. It perhaps reaches its acme the first week of June, but I have received contradictory information on the subject. The Murghab, and whatever streams are found in the Jumsheedee country, in Mymuna, and Undkho, may be presumed to be highest in the spring.

83. The Oxus and Jaxartes, and all their remaining branches which have been enumerated in the introduction, including the streams of Bulkh, rise in the spring, but are highest in the summer, notwithstanding the draught of that season. Some of the subordinate streams are higher in spring than in summer, but they are considerable enough to impart the same character to the principal ones into which they discharge themselves. With respect to the Neelum, and the rivers of Chinese Toorkistan, we know little beyond their names. From circumstances it may be conjectured that they are higher in summer than in spring.

Section IV.—*Of Salubrity.*

84. I am able to offer but a few detached observations on this subject. Its importance induces me not to pass it altogether in silence, although my opportunities have been small, and its natural difficulties are very great. There are few subjects on which opinions are so contradictory, and so many regular prejudices prevail. Medicine is at a low ebb in the country, and its professors entertain many absurd opinions respecting the original causes of disease, most of which they deduce from the qualities they attribute to different species of food, paying little regard to the operation of other causes, which among us are considered as the most palpable and powerful. The doctrines of Avicena are much followed, especially in Toorkistan. Physicians in these countries are not liberally rewarded, and many are obliged to travel from place to place in pursuit of a livelihood. These are chiefly natives of Peshawur and its neighbourhood, and their travels are principally confined to Toorkistan, which they visit on the opening of the spring. Few or no natives of Toorkistan or Khoorasan pass into other countries with such views. Some of these itinerants add the practice of the *ruml*, and other occult arts, to their accomplishments. They traverse great spaces, and being everywhere welcome, have the best

means of observing the manners of the people, as well as the nature of the country. Accordingly there are found among them many who are stored with curious and useful information. In their own profession they seem to be judicious, according as they have more or less discarded the absurd theories of their books, and proceeded on their own observations, and the practical remarks current in the quarters they have visited. Although surgery be on the whole in a low state, there are some operations which are here performed with great judgment. There are parts of the country in which continual strife prevails, and wounds are generally received, and yet scarcely one professed surgeon is to be found.

85. The Cabul Mission left Delhi on the 12th of October, 1808, and arrived at Beekaneer on the 5th of November. During its stay there many natives of the escort and camp followers were buried. This was not attributable to the unhealthiness of the place or season, but to some preceding circumstances,—severe marching in sand, bad or indifferent water on the route, and great vicissitudes of heat and cold between day and night in the month of October; but, above all, the incautiously eating water-melons and drinking water after heat and fatigue. In passing the desert some individuals were affected with *Nyktolopia*, but by proper treatment they speedily recovered. Diseases in Buhawulpoor, Mooltan, and Dera, and Ismaul-Khan are generally the same as those of our provinces, with the addition of eye complaints, which are comparatively rare in them. Coughs and catarrhs are common in Buhawulpoor. The natives of the detachment experienced during their stay in this country, a cold somewhat greater than that of their own. In the march to Peshawur they were exposed to severe rain, cold, and fatigue, combined. In Peshawur they were but ill accommodated, and exposed to heat and closeness, yet during all this time they were never unhealthy. They marched through the Punjab during the rains, a circumstance which far from being unfavorable, probably preserved them in greater health than they would have enjoyed if halted ; there is therefore no reason to conclude the countries they passed through to be unhealthy for strangers.

86. The water of the upper Punjab indeed, is celebrated both by natives and strangers, and the climate vaunted as remarkably salubrious. This boast is not altogether unjust, for here we find but little of the eye complaints so common in similar climates to the west and south. The Sikhs seem a healthy race, and there are found among them some fine persons and faces. They appear built, however, more for activity

than strength. They do not accustom themselves to foot service, and probably could not undergo great fatigue except on horseback. This is still more true of the natives of Toorkistan. Such is the plenty of horses in that country, and so much are they reckoned a necessary of life, that even beggars travel on horseback. The natives of Khoorasan have a great aversion to foot service, and do not excel in that species of travelling, in which the natives of India are generally acknowledged to surpass all their western neighbours. This is absurdly attributed to their foot, when it can be more naturally deduced from the state of their country and their mode of life. Among them none are equal to the Bhutties, or people of Bhutner, where there are said to be some who will travel 30 kos, and after robbing a village or a caravan return the same distance without halting. The people of Hurreeana are in this respect somewhat inferior, but are a robust nation, and in bravery surpass all their neighbours. Being now under our Government, it behoves us to consider how we shall make use of these qualities, or at least prevent them from being turned against us by an enemy. The hill tribes among the Afghans, and others, excel in climbing and in travelling among mountains. The Khyburees are employed in hill warfare as far east as Kot-Kangra, which is situated near the right bank of the Hyphasis before it leaves the mountains; but the Kohistanees are reckoned to excel all others in such operations, and have been known to fight well even in the plain. It is a common observation in the country, that the inhabitants of hills make little figure in war when they venture into the plains, and during the late broils more than one instance has occurred to confirm it. None is more striking than the defeat of Shooja-ool-Moolk, when in the spring of 1802 he brought a force of Khyburees against Peshawur. It is said their inability to bear the heat of the climate was the chief cause of their discomfiture, which terminated in many of them dying of thirst. The natives of the cold and temperate climates express the utmost dislike to the summer heat of that of the warm, but their impatience under it is not always in proportion to the coldness of their native places. The Cabulies support it better than the hill Afghans, or even the Dooranees, whose climate is much warmer than Cabul. This part of the Dooranee character has been very manifest in their history, and productive of important effects. The Persians, though inferior in courage, excel them in steadiness, another good quality of a soldier, and bear the extremities of heat and cold with equal patience. The poverty, ingenuity, and enterprising disposition of the Kushmeerees annually disperse considerable numbers of that nation

over the greatest variety of climates; and in pursuit of gain, they seem little to regard the heat or cold to be endured.

87. The natives of the warm climates do not manifest the same impatience of the winter cold climates; on the contrary, Cabul and Kushmeer are the theme of their praises. It seems doubtful whether this quality of the warm climates, by which those born in them are adapted to both species of climates, can be brought forward more in their commendation, or as an argument of their being plainly inferior to the others. It will be found generally true, that in cold climates there are more numerous diseases, perhaps more unhealthiness; but the natives are more robust and enjoy longer life. In these countries it is remarked that the hair sooner turns grey, and life is shorter in the warmer districts; eye complaints, moreover, are most common in them. When known in the cold, they usually proceed from travellers having exposed themselves to the glare of the snows; but the summer is the season of this complaint in the warm districts. Even those patients in whom they have become chronic, feel a remission of their pains in winter. The natives have no rational theory to account why they are more prevalent in some warm countries than in others. Because they affect moist districts rather than dry, these theorists maintain them to arise from the eating of rice, not adverting that they are not peculiarly severe in Kushmeer, and that there are places in which, though rice be the chief food, they are rarely known. It is a singular fact that ophthalmia begins to be common where the summer rains of India become scanty and uncertain. I am inclined to be of opinion with Volney, that it is caused by the dews and breezes to which those who sleep on the terraces expose themselves.

88. Fever is an universal complaint. Fevers are most common at the equinoxes, but those of the spring are generally of the hot species, where agues and low fevers prevail in the autumn—which, on the whole, is the unhealthiest season of the year. The former species of fevers are commoner in the cold than in the warm districts, and the reverse is true of the latter. The effusion of cold water in the paroxysms of hot fevers, though practised in Persia for ages, is here unknown, except to the Kafirs. It is a general practice to take purging medicines and to draw blood in the spring. Under another subject (see para. 51 and 58) a few places have been mentioned as unhealthy; there now remain very few to be added. There are many diseases in Kushmeer, a fact less owing to an unhealthy air than to filthiness, poverty, and the degraded condition of the inhabitants. The Kashmeerees are at the same time

a robust race, and excelled by none in carrying burdens over mountains. The Huzaras and Oozbucks, especially the former, are broad in their persons, and strong. The water drawn in the interior of Cabul disagrees with strangers, and there is a good deal of sickness among the poor by reason of their being ill accommodated, and the town too closely built, otherwise the climate is not unhealthy, and Peshawur is not inferior to it. Scrofula, a complaint little known in India, is not uncommon among the Daoodzyes, and some other tribes.

89. Khoorasan is undoubtedly a healthy country; and in Toorkistan we can name only a few situations which deserve to be called unhealthy. The most remarkable is Bulkh, which is afflicted with eye-complaints, all species of fevers, consumptions, the Guinea-worm, dropsy, and many other diseases; yet some of its villages have a good air. The most remarkable complaint of Bokhara is the Guinea-worm, which appears in some other situations in the east of Toorkistan and Bactria, in some villages of Candahar, in certain parts of Huzara and of the Pahar-turee of our provinces (see paragraph 71), in Hureeana Haroutee, and many other quarters of India. In all cases it is commonly ascribed to the quality of the water. In Toorkistan the inhabitants of those cities in which it is most prevalent drink from tanks, the water of which is only occasionally renewed. Where running water is to be had the disease disappears; yet I have heard it pretended that there is something in the air of Bokhara which occasions it, and a pleasing story is told of a certain Moolla who was sceptical in this particular. Being persuaded the water only was to blame, he resolved to use none but that of water-melons, and confidently expected to escape; but before he had passed a year in Bokhara he had a number of worms extracted from his body. The only other local complaints deserving of mention is the Goitre, which is now supposed to be the consequence of drinking water impregnated with certain minerals; it is not unknown in Bactria, but its chief seats are the banks of the Kishun Gunga, Sirn, and Pech. The waters of the Uba Seen have somewhat of the same bad quality, and Goitres are common in certain parts of the Gukhur and Khatir countries. It is asserted, that on the banks of the Pech even the dogs and tame birds are affected.

(To be continued.)

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ART. I.—*Memoir on the Climate, Soil, Produce, and Husbandry of Afghanistan and the neighbouring Countries.—By Lieut.* IRWIN.[1]

PART II.—OF SOIL.

90. It may appear an easy task to learn the nature of the soil in the various districts, or at least the more ostensible properties, such as colour and consistency, but in practice many disappointments will be experienced. Informants are apt to impose upon the inquirer their own petty experience, for the general truth of things; on few subjects is local vanity found so strong a vitiating testimony. Moreover, let the testimony be ever so candid, the circumstances of the case present some other difficulties. It is well known that within short distances the nature of the soil is often found to vary in all degrees. Evidence as to a small part of the district is here but little conclusive with respect to the whole, and it requires a large induction of particulars (which may not always be procurable) to establish an accurate generalization; and the terms used are often vague and of difficult interpretation. However strange, it is yet true, that the ideas of the Asiatics on colour are very different from ours, and their arrangement and nomenclature are calculated to mislead an inexperienced inquirer. From all these causes the following observations must be received, as they are offered, with distrust.

[1] Continued from p. 804

91. The immediate environs of Delhi are of a sandy soil, though not a mere sand, and generally of a yellow colour. In the northern road to Lodhiana after a few stages the soil becomes more and more loamy and black. The soil of Paneeput is a fine sandy loam. At Umbala, which lies on the left of the Kughur, the soil is a deep loam or mud, of a dark brown colour and great strength. Kughur and Sursootee running in a muddy soil are narrow and deep, and hence a slight fall of rain makes them impassable. The Markunda, which the traveller crosses between Shadeepoor and Lundee, before he reaches the Sursootee, ultimately falls into that stream; it runs in sand, and is shallow and broad. At Sirhind and as far as Lodhiana the soil has a greater proportion of sand than on the banks of the Kughur. The soil of the country of Bhutner is various. The cultivated parts are loam or sandy loam; some of the pastures contain tracts of sand hills, and others of level hard clay. Under the great northern hills the soil has a great proportion of mud, of a rich quality and much natural moisture. In the road between Delhi and Lodhiana, water in wells is found at moderate depths, but to the left hand, in Hureeana and Bhutner, we come to places where the wells are of considerable depth.

92. In the Dooab or country lying between the Sutluj and Beah, we find the soil to possess considerable variety, but on the whole it may be described as a sandy loam of excellent quality, very little elevated above the surface of the rivers, and the wells are consequently shallow. The Beah runs in sand, and sweeps away in its waters sand of a yellow colour; the Sutluj in the rainy season is more turbid and muddy. The right bank of the Beah is high and sandy, and there seems to be a gradual descent thence to the Ravee. The soil of this part of the upper Punjab has a great proportion of sand, but yet has sufficient firmness. The remaining two Dooabs have a less proportion of sand, yet little loam is to be seen. In some places tracts occur which are naturally sterile. In the upper Punjab, the greatest cultivation, though perhaps not the greatest population, is in places near the great range of hills which bound it to the north-east, the soil there having less sand and being of superior quality. On the whole strangers have too high an opinion both of the natural advantages and of the population of this province. Its water is much boasted of, and that of the rivers may deserve praise, but that of the wells is seldom good.

93. In this respect it is much excelled by the Dooab of the Hydaspes and Indus, in which the water is peculiarly good. I must be understood as speaking of that in or near the Embassy's route from

Attock on the Indus, to Julalpoor on the Hydaspes; it has been already mentioned that some parts of the country to the left, or north-east of that route, are noted for Goitres, a disease occasioned by bad water, (see paragraph 89.) The soil in the greater part of this Dooab but especially Pothwar, is a light yellow sand, which the rains cut into deep ravines in the most irregular and curious manner; every year the existing plain grounds are thus destroyed and new ones formed. Sometimes beneath the sand are seen strata of loose rounded stones, or of silt, stone, and sand, and these layers are sometimes of great thickness. Water in wells is near the surface, but the farmers are not at the expense of digging wells for irrigating their Rubbee crop, putting trust in the winter and spring rains, and the natural goodness of their land. Huzara and Pukhlee have good soils of various kinds, but yet inferior to Chhuchh; they have however greater command of water for irrigation. The soil of Kushmeer is generally loam, and in colour black or dark brown. The district of Pamper, in which alone saffron is produced, is a red clayey loam. The soil of Kushmeer and the nearest hills around it, is remarkably free from stones. The Hydaspes when low, is sea-green and turbid, its waters on reaching the Punjab are of a deep coffee colour. Its alluvial matter is loam, that of the Indus sand.

94. We return to Delhi to detail the nature of the soil in the Embassy's route thence to Peshawur. It becomes more and more sandy from Delhi to Rewaree and Kanour. The wells are of considerable depth, and the water often brackish. The country of the Shekhawuts, which next succeeds, is superior in all these respects, and the fields have occasionally a few stones in them derived from the low hills which traverse this tract. Leaving it we enter a sandy plain, generally abounding with sand hills. The depth of the wells increases at every stage till we reach Beekaneer, where it amounts to 264 feet. The water is sometimes good and sometimes brackish in various degrees. That of Nathoosur is peculiarly bad. Beyond Beekaneer the desert is commonly considered as beginning. To twelve miles beyond Poogul, or sixty-seven miles from Beekaneer, the same soil continues; but the sand hills are higher than before. Next commences a level hard smooth clay; this is locally called *Chitrang*, and it is only in such tracts that the traveller imagines he sees lakes and rivers before him. To the western edge of the desert is eighty-three miles more, and about half of this distance is clay, the other half sand, which appears to have been nearly blown over the clay. From Beekaneer the depth of the wells gradually decreases. The soil of the desert, generally considered, is not inferior

to that of Beekaneer, and where the sand and the clay are mixed in due proportions, is of an excellent quality. It is therefore neither the badness of the soil, nor the depth of the wells, as commonly imagined, that causes the desert to be so thinly peopled, neither is its water worse than that of the tracts to the eastward. There are several reasons to think it was in former times better inhabited. It is unquestionably for the interest of the British Government, that it should be utterly uninhabited and impassable; a little address and a moderate expense could effect this object even with a due regard to the rights of the present inhabitants.

95. The edge of the desert at Buhawulpoor is only three miles from the left bank of the Ghara, and the space between them from the north-west point of Sadik Khan's dominions to where the Ghara is lost in the Chunab (see paragraph 32) is seldom much more than double this distance. This narrow tract is of a soil not to be surpassed in fertility. When dry its surface has a degree of whitishness perhaps originating from a mixture of chalk; when watered it appears black. It is deep and friable, and may be called a clayey loam or mud. The Ghara when low has a whitish colour, and its water is very good. Its bed abounds in quicksands, having that mixture of fine sand and mud which seems calculated to form them. The rivers in general of the Punjab as well as the Indus have quicksands. Beyond the Ghara, on the road to Mooltan, is a tract of sandy ground, in which the wells are deeper and some of the plants and other appearances of the great desert occur, from which in fact it seems to have been cut off by the Ghara. It extends at most but two or three days to right and left of the road travelled by the Embassy; and gradually melts into the more fertile country which surrounds it. It seems to rest on clay, and the soil of Mooltan has a great proportion of clay; many of the fields give evidence of salt, and in general the soil is inferior to that of Buhawulpoor.

96. In the further progress of the Embassy from Mooltan to the commencement of the hills beyond the Indus at Punecala, the basis of the country appears still to have been clay, though in some cases the uppermost stratum be sand. At three and a half miles from the left bank of the Chunab begins the Thul of Mohummud Khan already mentioned (see paragraph 29 ;) it is sand of a poor quality, but not uncultivatable. It is broadest to the north, and there too the wells are deepest. In this quarter is situated Munkeera, the chief fort of Mohummud Khan, which is thought to be secure less by the strength of its own works, than the barrenness of its neighbourhood, and the scarcity and badness of the water. In the route of the Embassy the wells were

of moderate depth, but the water sometimes brackish. Towards the Indus the quality of the soil and water improves, but the country is still sandy. Mukulwad, on the other hand, beyond the Indus, is a stiff and hard clay of an ashy colour; in process of time it may assume a different character. On the one hand the Indus is continually encroaching on it, and washing it away. Where that river has mixed its sand with the original clay, the quality of the soil is plainly improved. On the other hand, towards the Daman and the hills, are considerable tracts of sand incumbent on the clay, and impregnated with salt; the rains annually bring down more sand and spread it on the clay. The original soil on the right of the Indus, even as far as Shikarpoor appears to have been clay, and clay is even now predominant; but towards the river a portion of sand has been introduced from its waters; and towards the hills sand or stones, or both, have been washed down by the rains. South-west of Dera Ghazee Khan, which is the capital of upper Sindh (see paragraph 25) on the road to Seeweestan, are the sands of Dajul, which if extensive would constitute a desert. Largee, (see paragraph 14) is sandy and unproductive. The plain of Eesa Khel is a clay or clayey loam of the best quality; it is of a dark red colour; its breadth is inconsiderable, and the Indus is daily diminishing it. The same changes in short are here operating as in Mukulwad, for here also we find a tract of barren and saline sands under the hills. The water of the Koorm after rain is of a bright red colour, and it deposits a loam of good quality. The district of Bunnoo is sandy, or a sandy loam. In the country of the Murwuts, which lies to the right of that river, and south-east of Bunnoo, are some tracts of sands very similar to those already mentioned; such also occur between Bunnoo and the districts of Malgeen and Kohat. These districts however have as yet received but little injury, from their neighbourhood possessing an excellent soil, which may be called a clayey loam. The colour in Kohat is black or grey, but in Malgeen red.

97. The original soil, and that which still predominates in the plains of Peshawur and Bajour is a clayey loam; there are now however several exceptions deserving of notice. Opposite to Chhuchh is the plain of the Mundeers, or lower Yoosufzyes, the soil of which is of the same kind and quality with that of Chhuchh. On the other side of the Cabul river the Khutuks possess the south-eastern corner of the plain of Peshawur, which is light, often stony, and of indifferent quality; more to the west, but still under the hills, are Oormul and some other places in which the soil is sandy and naturally poor. The Mihmund's lands are generally a clayey loam; and the Khuleel's

have a still greater proportion of clay. The colour of the soil is various; it requires much water and much stirring, but when properly treated bears heavier crops than most lands in our provinces. Bajour is of a like nature. The lands of the Mihmudzyes and Daoodzyes have had introduced into them by alluvion a considerable proportion of sand. The latter are thirsty, and bear but ordinary crops. Swad and Punjkora has each its river, and are less clayey than Bajour. The Gugecanee lands are clayey, but such as are near the Ootman Khel and upper Mehmund hills have a mixture of stone. The Khuleels have the firmest soil, the clay extending to a great depth, and water being at a considerable distance from the surface: hence this tribe have dug many underground dwellings, in which to take refuge during the heat of midsummer, and they are not subject to fall in like those made in other parts of the plain.

98. Teera has a stony soil, which generally contains a considerable proportion of sand. Koonur and Lughman are loams of good quality, and very well watered, and productive in rice. The former because of its wideness requires a greater quantity of water for irrigation than Bajour. Jellalabad is a sandy and thirsty soil. Under its hills (the range of 34°) there extends on the left hand of the traveller to Cabul a barren tract, in length about forty-five miles from Busawul to Nimla; and in average breadth about five or six. It is partly stony and partly sandy. Perpetual winds here prevailing, it is thought that these sands are encroaching on the good lands. The present soil of Jellalabad has probably been transported from them by the winds. The lands of the upper Mihmunds are of very various kinds. Kama is clayey and moist, Goshta is inclined to sandy.

99. We find considerable variety in the soil of Cabul. The greater part is a loam with a great proportion of clay, but stones, gravel, and sand, have been lodged under the hills by the rains. On the left hand of the traveller as he goes to Ghorbund from Cabul, is a sandy tract under the hills. It is about eleven miles long by four broad, and quite uncultivated. This is the Reg-ruwan of which many fabulous stories are told by Aboolfuzl and others. The gardens and grounds used for raising vegetables in the vicinity of Cabul, have, by long care and culture been cleared of stones, and now have a black, fertile vegetable soil, from nine to twelve inches deep. In general the lands in this valley bear heavier crops of all things proper for the climate than those of the plain of Peshawur; but this is partly attributable to the plentiful manure and assiduous culture they receive. Draw-wells are but little used, as water is near to the surface; but the water of draw-

wells in the city of Cabul is acknowledged to be bad. The neighbourhood of Ghuznee has a light soil, with a mixture of small stones. Some other parts of the table land are stiffer, as having more clay in their composition. A mixture of stones in the cultivated fields is universal, and indeed considerable tracts of the table land are so covered with small stones, as to yield but little, even in pasturage. The north has a good deal of broken ground; the south is more level. With respect to the lands of the Huzaras, they are of no one kind except that they are generally stony.

100. Mookr and Abitazee, on the road from Ghuznee to Candahar, have light soils with a mixture of small stones. The Dooranee country generally considered must be pronounced sandy. Near Candahar the soil is sandy and thirsty, but facilities exist for irrigation. In the city of Candahar water in draw-wells is near the surface, and of good quality, and few places can be named in the whole of Khoorasan where the water is bad. In general the inhabitants drink from running streams, but draw-wells are not unknown, especially within cities and in the desert places frequented only by shepherds. Between Hirat and the Persian Khoorasan there is a sterile tract, which forms an imperfect barrier. The Regimulikan would be crossed in the direct road from Jellalabad, the capital of Seestan, to Furah, and is of considerable extent. South of Soorbut the traveller crosses a desert tract forty miles broad, on the road to Goonabad and Ghaeen. In Seestan, especially the west, there are considerable expanses of sand, generally without fixed inhabitants, and sometimes without water. Between Jellalabad and Kilat of the Beeloches, the country is supposed to be generally a desert. The various desert or sterile spaces now mentioned, appear to me to have an imperfect communication with one another, and therefore do not constitute a military barrier; nay, we perhaps over-rate the difficulties they would throw in the way of the disposition and passage of troops. By digging draw-wells an enterprising and ingenious enemy would find water at a less depth in the earth than is commonly imagined.

101. Zumindawur is situated, as already mentioned, on the right of the Helbund, (see paragraph 56.) Its soil is more loamy than that of most other parts of the Dooranee country, and is of a good quality. North-west of it is the country called Seahbund, situated within the Paraparnisan mountains, and inhabited by the Tymunus, a tribe of Ymaks: part of it has a clayey soil. The Gurmseer lies south and south-west of Zumindawur. Its soil, which is naturally sandy and weak, is rendered productive by water drawn from the Helbund. The Joolgha

or plain of Hirat is a sandy loam naturally fertile, and being well watered bears good crops. The same species of soil extends to Murv, and beyond it, although the intermediate space be little cultivated. The soil of Murv is esteemed very good ; that of the Jumsheedee tribe, whose territory forms the north-east corner of Khoorasan (see para. 19, 27,) is perhaps equally good, and the Ymak vallies are in general fertile. In the Jumsheedee country, and also in Jam and Toorbut, is a great deal of broken ground. There is a less proportion of this in the country of Ghaeen, and Birjund, and in Zumindawur, but still it is considerable. Ekatool, belonging to the Ulukhoo-Zyes, a tribe of Dooranees, is remarkable for the quantity of its ravines and broken ground. Sungoo a city of Khaf has a hard clayey soil. The soil of Mushhud is good and productive. To the north we soon reach the desert of Margiana, which is generally a sandy plain, but contains some low hills or hillocks. To the east it approaches near to Muno, and north of that place joins the sands lying between Bactria and the Oxus (see paragraph 104.)

102. The great desert called Loot, lies south and west of Seestan, and divides Seestan and Khoorasan from the Persian province of Kirman. It undoubtedly communicates with deserts in the west of Bulochishtan, or those deserts form a part of it. It is throughout a sand, probably quite uncultivatable, and the edges only are visited by the pasturing tribes. It is crossed by caravans, and sometimes by small parties of marauding horse, but in these quarters those who go on expeditions, generally mount themselves on camels, as being more patient of thirst. Like other deserts its outlines are not easily traced, as it gradually melts into the inhabited country. In the road to Tubus (the westermost of that name) in Khoorasan, the last inhabited place in the province of Kirman is Durbund, which is forty *fursukhs* from the city of Kirman—at Durbund are some brackish springs ; thence are forty-five *fursukhs* of desert, to Chihlpaya, where are no inhabitants, but a tank containing rain water, and a bowree dug by the order of Nadir Shah. It is reckoned to be 300 feet deep, and the water is brackish. There is here a hill which appears as if overturned by some convulsion of nature ; it has not the least vegetation, and there is little grass or even shrub in this dismal desert. After fifteen *fursukhs* more, we reach Naeebund, where is some good water from springs in hills, and a few resident inhabitants. The country is still sandy and continues so far, several stages towards Tubus, and the population is but small. There is a road east of this road from Nil (see para. 27) to Khubees, where the chief inhabitants are Ghiljees, who settled

there during the time that the Afghan dynasty ruled Persia. This is even a less practicable road than the other, and in summer is not travelled. There are eight stages of a camel journeying almost incessantly, and no water is to be had in the whole space. This desert then may be pronounced impassable by regular troops, except in the smallest bodies.

103. Our knowledge is very scanty concerning Bulochistan. Its western parts or western boundaries are generally desert, but in some places villages are interspersed. There is a winding road from Kilat to Kirman through Punjgoor, Jalk, Dezuk, and Bempoor, but various parts of the stages are desolate; the soil even in the route I conceive to be generally sandy; the fertile spots are at the foot of hills, which yield them either by nature or by means of art, a scanty supply of water. The hilly tract on which is situated Kilat is much superior to the preceding, yet even here are several upland wastes in which even water is not to be had for one or two days' journey. The soil of Kilat seems to be generally loamy, but in some places is a stiff clay. Such feeble streams as the Buloch hills yield being soon absorbed in this warm climate, there intervenes a dry space between the hills and the sea-coast, which may be compared to the Tehama of Hejaz and Yemen. In this space Rind tribes wander, whose chief riches are their camels. The soil seems to be most commonly inclined to clay. In Seweestan, a clay or clayey loam seems to predominate, but Dajul (which perhaps belongs to Sindh) is sandy, and there are other exceptions. In Seeweestan water in draw-wells is deeper under the surface than in Sindh, but yet at no inconvenient distance. In some routes spaces occur, of perhaps forty miles broad, where neither water nor cultivation is to be seen, but there is little reason to think the circumstance owing to the badness of the soil; some were formerly well peopled. There is a tradition that the river Indus taking a bold turn to the right formerly ran through this country, and appearances are said to favor it. The lake or swamp called Manchoor, mentioned by Aboolfuzl, was perhaps a part of the bed of the Indus; it is thought to be in the south-east. Aboolfuzl tells us it is near Seewee, but this I conceive erroneous. There are some low and moist lands in Seeweestan, which perhaps were also parts of the Indus bed. There is reason to think that from other causes the rest of Bulochistan (and the remark might be extended to other countries) is drier and more barren than in former times.

104. The soil of Bactria from Mymuna to Talikan, has a great proportion of clay in its original composition; at present this is most

visible in those parts which are neither near to the hills nor the Oxus; for towards the former, the matter brought down by the rains has often changed the soil to stony, gritty, or gravelly, sometimes to sandy; towards the Oxus the soil becomes a loose unfertile sand. The sands begin at Huzrut Iman, and continue to the lake of Aral, their breadth continually increasing. In the space intercepted between Huzrut Iman and the common road from Bulkh to Bokhara, through Kilif, the average breadth of these sands, which are nearly waste, is more than thirty miles; the sandy tract opposite, on the right of the river, is not so broad. The soil of Bulk is a clayey loam, sufficiently friable, and of a good quality. That of Koonduz is very similar, and in colour black. Khoollum, and generally that under the hills is a hard gravelly clay. Talikan is a loam inclining to clay, of a good quality. Undkho has a good deal of sand, but Mymuna is a strong clay, and abounds in ravines and broken ground. About half way between Undkho and Mymuna the traveller begins to see numerous hillocks in the plain, and they continue as far as Muro, and almost to Hirat. They are composed of a good soil, without stone, and bear good grass; they are sometimes under crop, but the chief cultivation in this space is near the moist banks of streams constant or temporary. Budukhshan has a stony soil, but otherwise it is very various in consistency, colour, and excellence. Fyzabad is a sandy loam of a reddish colour, as is found in many other places. Durwaz, and the Shooghnan and Wukhan vallies have a blackish soil. The same observations are probably as applicable to Wukeeha and Keerategin as to Budukhshan.

105. The west of Toorkistan is sandy, and without artificial watering yields poor crops; hence the chief cultivation is near the banks of rivers and streams. Between Kilat and Bokhara the water of wells is usually brackish, but is found at moderate depths. The hillocks near this road are of sand, not of a good soil as those of Bactria. To the west of Bokhara is the Kurakol, an uncultivated space which extends to the lake of Aral; but it is not considered as crossing to the left of the Oxus, where begins the great desert of Margiana, so called by the ancients. The principality of Khwaruzm is thus encircled by deserts. It is however to be remarked, that the Toorkmuns who live on the edge of the river, generally avail themselves of the facilities it affords for irrigation in its flood season, and raise some crops on the low grounds near it. Water is here so near the surface, that the inhabitants often dig wells, where they pitch their tents, to serve for their use during the time they may halt. In the interior of the deserts there are wells, which have

been dug by the governments of former times; these are never remarkably deep in the Kurakol, but the water is at least as good as that of draw-wells in the neighbourhood of Bokhara. The soil too is seldom impregnated with salt, and were it the custom of the country to water lands from wells, it could be brought into cultivation. At present it affords an early grass to be pastured in the spring. That part which is next to Bokhara, was formerly cultivated. The Kurakol extends beyond the Jaxartes into the country of the Kuzzaks, but that people have also hills and declivities with a good soil. With respect to the Kirghiz country, and the east of Toorkistan, the soil has considerable variety; many places are stony; loam and clay are very common, and in natural fertility the cultivated lands of the east are unquestionably superior to those of the west. The Pamer has a rich soil.

106. In the vast extent of Chinese Toorkistan it may be supposed there is to be found all varieties of soil. That of Yarkund is sandy and weak, and sandy wastes intervene between it and Khootun, in which the Chinese Government have erected pillars to guide the travellers into the right road. The uncultivated space is about an hundred miles broad, if we pursue the ordinary road. The soil of Khootun is superior to that of Yarkund, and the cultivation considerable. The river of Yarkund passes through this country. To the north-east sands soon recommence, in which the river is at length lost, at no great distance from Toorfan. Ela and Aksoo lie near to mountains in northerly directions, are tolerably well watered, and the soil is good. Akeoo seems to be north and a little east from Yarkund, and the road is sometimes inhabited, sometimes not.

107. There remain some countries of which we have little information which can throw light on the present subject. Such are the Tibets and Kushkar. We know that they are ill cultivated, and perhaps the climate condemns great part of them to sterility. Other parts may be occupied by rocks and stones. From the particulars now detailed, it is evident that the countries most favoured by nature, are neither the upland tracts nor yet the open plains distant from hills, but those which lie at a moderate distance from their foot, and receive the water which flows from them. Lofty mountains however barren themselves, are the cause of fertility to the plains below. In the vast expanse here treated of, there is a very great proportion now uncultivated, and may continue so for ever. Some part is a loose sand or hard clay, unproductive without much water, which at the same time the climate and situation deny; another is covered with a profusion of stones. The composition of some lands seems adverse to the growth

of useful vegetables. The commonest species of this kind is saline land, which occurs at intervals in almost all the various districts which have been mentioned. A mere sand and a very hard clay seldom give evidence of this quality, which is thus found in soils otherwise of the best composition. Chhuchh, the lands of the Mundurs, and those of the Huzaras, are remarkably free from it. A certain degree of it is by no means inconsistent with fertility, nay, the natives of the west of Khoorasan, prefer land moderately saline for the raising of melons and cucumbers: some remarkable saline spots are mentioned under the subject, which next follows, (see paragraph 112.)

PART III.—OF NATURAL HISTORY.

SECTION I.—*Of Minerals.*

108. The Persian metals are not found in these countries in great abundance. Most of the streams which rise in the great northern range, or in that branch of it which forms Kafiristan, and also those streams which arise in the Belur, wash down grains of gold which the natives take pains in collecting, but it is not supposed that this business is very profitable. In some parts of the south-east of the Huzara country, grains of gold are also found. With respect to silver, if we except a little found in the country of the Kafirs, it is produced no where but in the Chinese dominions, and I am not sure whether it be in their ancient territories or their new acquistion of Chinese Toorkistan. Copper seems to have been formerly found in the district called Seahbund (see paragraph 101) and according to some it is produced not far from Nishaboor, which is in the Persian Khoorasan. The same hill which yields it, is said to yield iron and lead; but according to others, lead is the only metal produced. Between Furah and Ghaeen, is Tubus, called *Miseen* from its copper mines, and to distinguish it from another Tubus, far to the west, commonly called Gil Tubus. At present both are under the Persians. Indications of copper are to be seen in the Bajour territory. In the kingdom of Bokhara, is a town called Sherabad, about seven days south-east of Bokhara, and about two days north of Sherabad is a hill called after it which produces copper, not wrought, and also verdigris, which is an oxyde of copper. With respect to precious stones, the ruby mines of Budukhshan, once so famous in the whole world are no longer wrought. We are told that in the south-eastern parts of that country

are whole rocks of *lapis lazuli.* Nishaboor is still famous for its turquoises, which are found in a hill in its neighbourhood, that yields no other mineral product. Major Welford has mentioned lapis lazuli, hyacinths, crystal, bajor, stones of a superior quality, and marbles of various colours, being found not far from the banks of the Indus, before its junction with the Cabul river, (see his paper on mount Caucasus in the sixth volume of the Asiatic Researches) I scarcely remember to have heard of these things, but as that author's information is generally very correct on points of geography and statistics, I presume there is much truth in the account.

109. Aboolfuzl has mentioned an iron mine at Khiroo in Kushmeer, and it is still wrought, being perhaps the only mineral of any note to be found in the valley. There are numerous mines of iron near Kanee Goorm of the Wuzeerees, which lies to the north of the range of $32\frac{1}{2}°$, towards its termination to the eastward. Iron is found near Burawul, and Burwa of the Turkoolnees, and also above Deer of the Yoosufzyes, lying in Punjkora. In all it is gathered in the state of coarse sand or gravel. An iron mine was formerly wrought near Dhukha of the upper Mihmunds. Near Cimnan, a city of Khoorasan, on the frontiers of Irak, iron is produced, and also in a hill four days south of Ghaeen. The existence of iron in the territory of Nishaboor is disputed; an ore of this metal is found in a hill of Chhuchh or Huzara, six miles west of Hussun Abdal. In Toorkistan there are very numerous mines of iron. In the territory of Kokum may be two, in that of Bokhara one, in that of Hisar two. Shuhursubz has one mine, the territory of Tashkund one, perhaps more. It is said Keerategin and Durwaz have none. In the territory of Fyzabad there are four mines; and in the small principality of Kolab, the greater part of which lies on this side the Oxus, between Keerategin and Fyzabad, there is one. Bulkh has one mine in its hill to the south, and Tolekan another. Notwithstanding the number of iron mines in Toorkistan, that metal is imported from Russia, and is of a superior quality.

110. Lead is very abundant in many parts of these countries. Not unfrequently it is found in the same matrix with soorma, which is an ore of antimony ;* sometimes it is found alone, as soorma also is. I have heard of the following mines of joint lead and soorma, viz. two in the country of the Afreedus, one at Khakshista of the Huzaras, south of Bameean, one or two near the source of the Urghundal, two

* I am now (January 1811) assured there is also sold under the name of soorma a certain sulphate of lead, and it is natural to suppose, this is the substance here meant.

at least in Chitral, and one in the dominions of Kokur. One mine of lead is found in upper Bungush. In the country of the Shinwarees, who are west of the Afreedus, one mine. There are two mines in the country of the Kokurs, and one at Turbulakh of the Dehzungee Huzaraś, who are the most westerly of all. Near Baghis of the Tymunees within the Ymak hills, the spring torrents bring down pieces of this metal. I have not heard of its being found in any other place of Khoorasan, except near Nishaboor. In Toorkistan it is very abundant. There is one mine in the hills near Bulkh; in the principality of Talikan there seem to be two mines. In the district of Undurab there is one mine, and in that of Khoost another. Lead is also found in Khirjan, which lies between Khoollum and Bameean. In Budukhshan lead is abundant, and there are three or four mines in the valley of Wunj. Some lead is also brought through this country from Kashkar and the borders of the Kafirs. Kolab has two mines, Buljeewan, which is under the lesser Kolab and is beyond the Oxus, has one, and in the territory of Hisar are two. Nooruta has one mine, and there is perhaps another in the dominions of Kokun, and one or two in those of Tashkund. There is one mine in Keerategin, probably more. Soorma without lead is found in the principality of Talikan, in several places, and is said to be abundant in Budukhshan, Durwaz, and Keerategin. Soorma is found in the country of the Besoot Huzaras, who are among the most easterly of that nation. A mineral called white soorma, is found near Dubran, which lies north of Huzara.

111. Orpiment, which is yellow oxyde of arsenic, is found near Sakhir in Seahbund, and in more than one place in the hills of Bulkh. It is also produced somewhere in Budukhshan, near Lungreeal, which is not far from Dubran; it is the ore of some metal of a whitish colour and a consistence which adapts it to be easily made into bullets. Towards Cabul and in many other places, the villagers use a certain species of gravel, called *sungisachma*, for shot. The most famous place for sulphur is Gogirduk, between Khoollum and Bulkh, but this mineral is said to be found in some other places of Bactria, to the east of Bulkh. Some is produced in the territory of the greater Kolab, and some in that of Fyzabad. Sulphur is reported to be found in the hill of Sherabad (see paragraph 188.) It abounds in Chitral, and some other parts of Kashkar, and some of it is in an oxydized state. Some is to be seen in the desert of Margiana (see paragraph 101.) There are two mines in Seeweestan, of which one is near Bhag, and one not far from Sunnee. The western Tubus is famous for its sulphur, as well as its tobacco. Some of the springs of the Kafirs

smell of sulphur. In these countries are many warm or even hot springs which could be named. The other natural curiosities known to the natives do not deserve much mention, especially as the circumstances of some seem fabulous.

112. The supply of common salt is from various sources; rock salt, that of salt ponds, that of springs, and that made from the soil. A minor range of hills has been already distinguished as the Salt range, (see paragraph 12.) Some is found at the beginning of the range in the country of the Oorukzyes, but is of little note beyond the neighbourhood. At Kala Bagh, the hill which overhangs the town, is in a great part composed of salt. Near the termination of the range, this mineral again becomes very abundant, and is found in several places. This is that which in our provinces is called *Lahouree*, as coming to us through Lahour, though all produced beyond the Hydaspes. It is of a dingy colour, whereas that of Kala Bagh, which is superior, is either so white as to be pellucid, or tinged with a red colour from the clay contiguous to it. The north is supplied from these mines, whose produce is carried even into Kashkar, where it fetches a high price, because of the natural difficulties of transporting it. It is rather heavily taxed, in Kushmeer which makes it dear. When the governor rebels, which has often happened, and trade is checked by the existence of hostilities, the dearth is still greater, in so much, that the Kushmeerees having no interval supply, have been reduced to eat red ants as a substitute. In the south of the kingdom, the demand for rock salt is not great. Some is indeed carried from Kala Bagh, as far as the lowest parts of Sindh, but this traffic bears no proportion to the riches and population of that country, and indeed seems an appendage to that in the transporting of pilgrims, who intend visiting the holy city of Mecca. The boats are sold on their arrival with what cargo they may contain, and few if any again ascend the river as far as Kala Bagh. In all parts of Bulochistan, soil salt is that chiefly used, and each neighbourhood makes it for itself. Even the Mooltanees consume more of this kind, pretending that the other is unwholesome. Candahar is partly supplied with salt from that made by boiling the water of a spring at Kushkinukhood, 40 miles on the road to Hirat, and partly from the soil; the latter is reckoned inferior. The chief resource of the west or rather middle parts of Khoorasan, is probably in salt ponds, in two different places of the country of Ghaeen. An ice-like crust is formed at the edges, when the water begins to recede in the dry season, and no further preparation is required. Besides the salt well in the Loot desert already mentioned, there is one about

40 miles south of Toorbut, and another in the road between Toon and Yezd, but none of these are of any use. Near Ubasabad, which is ten days from Mushhud, on the road to Tuhiran, is a hill which gives out two feeble salt springs, which make two bogs, and to procure salt pits are dug at the edges and filled with the brine; this gradually evaporates, and is covered with a saline crust.

It is probable, many lesser ponds and bogs of this nature exist especially in the level countries. Bokhara and Nooruta chiefly consume salt brought from places in the Kurakol (see paragraph 105.) Jizzukh has a mine of rock salt, and also salt from the plain. Samarkand is said to have one mine, Oratepa another. All the three are under Bokhara. Oorgung, Mura, and Mymuna chiefly use salt found in their own plains, sometimes artificially prepared, sometimes not. The kingdom of Kokur is not destitute of soil salt, but has besides at least four mines of rock salt. Tashkund has one, probably more, and also receives salt from the plains to the west towards the Kuzzaks. We know of two mines in Keerategin, one in Buljeewan, two in the greater Kolab, and the valley of Wakhan has rock salt, but the southern part of Budukhshan in which is situated Fyzabad, seems to have but one mine, and its produce is very bad. The eastern part of Bactria, on the other hand, is abundantly supplied, having at least five mines, and Duroona beyond the Oxus has one. One mine of Shuhisubz yields salt of a very fine quality, which is carried as far as Bulkh and Bokhara for the use of the rich. Hisar has a salt spring, and two mines very little worked exist in its dominion. Bulkh and Bokhara are partly supplied from springs found between them, partly from a place under the hills, where a crust of salt is produced. Shibirghan has a mine of very good quality, and exports to Bulkh, Undkho, and other places. I have not learnt that any salt is found within the Paraparnisan mountains, and such is the scarcity of this article among the Huzaras of the interior, that they do not use it dry but dip their morsels in a brine of it. At one time of the year the poor have none to consume.

113. Saltpetre is no where found in these countries but is made by natives, from the soil in innumerable places. It is a curious fact that the same earth which yields common salt often yields saltpetre also, although both ingredients be different; but dry situations are more favorable to it, and moist to the generation of salt. To complete the list of ingredients used for making gunpowder, it may be observed that no place is much famed for its charcoal. The best is made from the willow, and very good from the plant called uk or mudar (see paragraph 130.)

Borax is dug up near Mushhud in an impure state. A salt called black salt is found in a hill some miles south-west of Kala Bagh. The most famous product of Kala Bagh is its alum, which however is not native, but is prepared from a mixture of pure clay and sulphur, found in the same hill which yields salt. The same exists in small quantities in the quarter where the Lahouree salt is produced.

114. I have made no mention of the minerals of the Tibets, or country north of the Punjab, or those of the Rajpoot country. We know little of the minerals of Chinese Toorkistan, except that coal is burnt at Ela, in that country; and some mistakes have probably been committed in assigning the situations of mines in independent Toorkistan. With respect to the structure and general composition of the hills and mountains, it is needless offering conjectures; the hills seen by us were plainly secondary. Soft and composite rocks appear to be very common in Afghanistan, and hence it is that in a country so mountainous, few houses are built of hewn stone. The valley of Kushmeer is peculiarly destitute of stones proper for building; wood at the same time is cheap and abundant, and therefore the inhabitants erect lofty houses of that material. Good flints are found in many places in the south-east of Bactria, (from whence they are brought to Cabul) in some low hills in the districts of Muro, in those west of Sindh, and doubtless many more. Upper Bungush produces a marble much esteemed.

Section II.—*Of Vegetables.*

115. The present is a subject on which little is known. What here follows being also very imperfect, it is needless to affect nice divisions, and it is enough if we distinguish plants into three classes; first, grasses and small succulent plants;—second, shrubs;—third, trees.

1*st. Of Grasses, &c.*

116. It is moisture which chiefly encourages the growth of herbage. Those countries however are not the most verdant in which the greatest quantity of water falls in the year, but those in which there are many days of rain, dew, and mist. The water which falls in low latitudes, does so generally in a short space of time, and with great violence, so that drought prevails during the greater part of the year; hence warm countries are seldom verdant. We should be in error if we supposed that heat, as distinguished from drought, was

hostile to verdure. The season of grass in all countries begins with the renewal of the warm season, unless in circumstances the most peculiar; and even in warm countries the herbage withers at the beginning of winter. Neither are we to decide that warm countries have naturally more grass throughout the year than the cold; for if their summer be dry, the heat of the sun soon withers the pastures, which do not recover until next spring. It is evident therefore that the growth of herbage will be greatest where heat and moisture meet in due proportions. Moisture may arise from the atmosphere or from the soil; and with respect to the moisture of soils, it may arise either from the composition or a low position. It is thus that a clayey loam is better covered with grass than a loose sand or a hard clay; and many districts, the drought of whose climate would leave them little verdure, have abundant grass which is nourished by the water descending from higher situations. A new complexity is added to the subject when the periodical rains fall in the summer, and thus revive the grass which has been withered by the heat in the warm climates.

117. It is found that in India every grass and small plant has its natural seasons of putting forth its new leaves, flowering, casting its seed, and withering. Most of them flourish most in the Kureef, that is after the great rains have begun to fall. Very many however even of these put out new leaves in February and March—soon to be burnt up by the scorching winds; and some of them bear seeds in the Rubbee as well as the Khureef. Some plants naturally flourish in the Rubbee; for example, the Sehoon, or wild oat—the seeds of which are shed before the commencement of the great rains, but do not spring up until perhaps the month of October. From what has been said, it is plain that in India there are two seasons of grass—the lesser in spring, and the greater in the great rains, and for a short time after them. The winter months have but little fresh grass, but there is a considerable resource in the withered grass of the Khureef. Between the spring and Khureef grass is an interval in which the pastures are burnt up by the excessive heat and drought; if the soil be very moist, or frequent showers fall, this interval may not be perceptible. It may be supposed to be the same with every country which, like Hindoostan, has a warm climate, and its chief rains in the summer; but when either fails we no longer find these two natural seasons of herbage. When the cold reaches a certain point, the heat of summer is not sufficient to wither the grass after its commencement in the spring, and this is reserved for the cold of winter. The grains of the Rubbee, also, it may be observed, in climates where the winter reaches a certain degree of

length and severity, do not spring up in autumn, but in spring, and ripen in autumn. In warm countries which have no summer rains, the spring grass having once withered, does not recover during the remainder of the year.

118. In the Punjab and Sindh the seasons of grass are the same as in our provinces, and the species are much the same. In the upper Punjab there is perhaps more grass fit for provender than in our upper provinces, but the large kinds used for thatching are scarcer, this however is of little consequence, the inhabitants prefering flat-roofed houses covered with mud, to the thatch so common elsewhere. Hurriana and Bhutner are well known to have abundance of good grass; and the country in general which lies between the Sutluj and the Jumna is more verdant than that on this side of the latter river. The Dooab of the Hydaspes and Indus present the usual varieties. Pothwar has but little grass, except in the bottoms of the ravines. The hilly country of the Gukhurs, and others already mentioned to the north, appear to have much grass, but this does not arise from the great growth but from the small consumption. In the Thul of Mohummud Khan, as in the great desert, we find more shrubs than grass. Mooltan, and upper and middle Sindh, have little grass. The spring of Peshawar is naturally later than in our provinces, and the rains which then fall have an additional tendency to protract the time of fresh grass. The lateness of the summer rains, and their comparative unimportance, makes the Khureef grass later in commencement, and causes it to be little superior to that of the spring grass in this country; it is even said that in Jellalabad the spring grass is of more importance than the Khureef. In Seeweestan though the summer rains are scanty, the Khureef grass is superior to the other kinds; but herbage is not abundant in that province. Peshawar, though its summer rains are deficient, has yet as much grass on an average of all months as our provinces, for showers fall at different times of the year, and the soil is good. The name of Shurhsubz which Tymoor gave it, we may suppose alluded rather to its constant succession of green crops, than the exuberance of its natural vegetation in grass, which is not extraordinary. The least quantity of grass is in the middle of winter and the middle of summer.

119. The seasons of grass in Chhuchh, Huzar, Kohat, Malgeen, Eesakhel, and Bunnoo, are nearly the same as in Peshawar, and the quantity not very different. Mukulwud has but little grass, but some parts of the Daman have a great quantity. The hills called Bedaulut, owe their name to the scantiness of their herbage. The hills of Bajour,

Punjkora, Swad, Bhooner, and Pukhlee, afford abundance of grass in the summer; and the plain of Bajour is even more verdant than that of Peshawar. The grass of Koonur is inferior to that of Bajour, and that of Jellalabad to Koonur, but Lughman is superior to both. Kushmeer, and the hills which surround it, have a very abundant herbage in summer, but it is not reckoned nutritious; in the winter the sheep and other stock are house-fed—a management probably more judicious than if they were kept on the grass remaining under the snow, or were driven to a warmer climate.

120. A great part of the surface of the districts of Cabul and Ghuznee is covered with stones, and the soil is in other respects unfavorable to the growth of grass. The new leaf appears in April, and there are but few places, where it is affected by the summer heat, or withers until autumn. If the soil be moist and has been well covered by snow, the grass remains green even during the winter, but makes very little progress in the spring. It may be observed, that the grass of sandy soils appears earlier and also decays sooner than that of other soils. In the winter the sheep of these upper countries are driven to warmer climates to the eastward, and have been known to come as far as Husun Ubdal. It would be difficult to estimate whether the cold or the warm countries here have most grass during the year on a given surface. In the summer, that of the cold is most luxuriant, but in the winter there remains little beyond some withered herbage under the snow; whereas in that season the warm countries have a certain degree of verdure remaining, especially after a shower, and when the surface is free from snow. The nature of the soil too has an influence, and the upper countries are the less productive of grass, as much of their surface is covered with stones. Cabul is proverbial for a scarcity of fodder, but this does not arise from the nature of the soil, but from there being a great number of horses and other animals, and but little ground for pasturage left uncultivated.

121. Khoorasan has a dry climate, and no summer rains; hence its temperate and warm parts have very little herbage. Bulochistan has still less, and Seestan is ill supplied. Sheep and goats are seldom kept in the villages, but pasture during all seasons at a moderate distance from them. There are indeed certain parts, particularly in the Dooranee country, where the flocks return to the villages after the grass has been burnt up, and are subsisted on straw and other products of agriculture or gardening, with some assistance from the meadows which are not withered by the heat. A considerable part of the Dooranee flocks are driven in summer to the

country of the Ymaks, where they find plentiful pasturage. The Ymaks do not, on the other hand, resort in the winter to the country of the Dooranees, which has less herbage than their own, though warmer, but returning to their *kishlaks*, or winter residences in the vallies, subsist their flocks partly on what grass they can find in good weather, and partly on what has been cut for them in the autumn. The Huzaras, in a climate still more severe, reap great quantities of grass for their sheep, which are seldom unhoused during three months of winter, but sleep under the same roof with their master. Grass is very abundant during the summer in both countries. Bactria too, with the exception of the sandy spaces, is a verdant country and has many meadows, which are always green. In the plains the snow is seldom so deep as to prevent the cattle reaching the grass, but among the hills it is found prudent to provide in part for their provender by a stock of grass, cut in the autumn. The reaping of grass is very common in Kushmeer and in parts of Pukhlee, Bhooner, Swad, Punjkora, Cabul, and Ghuznee, but in general the sheep which have not gone to the low countries are driven out to feed on the shrubs and withered herbage of a hill exposed to the sun, which has been reserved for this purpose. Straw also composes a great part of their food.

122. With respect to Chinese Toorkistan, we have little information. Yarkund and the sandy tracts (see para. 106) have but little grass. Khootun is in this respect much superior, as in most others. As to independent Toorkistan beyond the Oxus, generally considered, it is not inferior to Bactria, but within it we are to distinguish—1st, the dry sandy plains—2nd, the moist plains and meadows—3rd the little and lower hills—4th, the high hills and elevated plains. The first has least grass; the new leaf which had been nourished by the snow is on the 20th March about three inches long; after three months it withers from the heat of the sun. The meadows have abundance of grass, which is continually renewed. Some banks of rivers have a close sweet turf, but the meadows in general afford a deep grass. The lower hills are better clothed with grass than the dry plains, but are not equal to the meadows; their grass has nearly the same periods as the former, and on a given surface perhaps supports during the year an equal number of animals. The hillocks, are, in the country beyond the Oxus, of sand, and bear a scanty grass, which soon withers. In Bactria and Muro the hillocks are of a good soil, and bear good grass. The high mountains and plains of Toorkistan have a grass which makes little progress in the spring, but grows luxuriantly in the summer, sometimes exceeding a man's stature, and it does not wither until autumn; the inhabitants

reap a portion of it for the sustenance of their stock during winter. In the west of Toorkistan this practice is but little known. In districts, such as that of Samarkand, which are well cultivated, the stock, which is not very numerous, is fed on straw or hay. Where natural pasture is near and plentiful, they are driven out to it even in the depth of winter; hence an extraordinary fall of snow causes a great mortality among them. It is still more fatal to the stock of the Kirghizes and Kuzzaks, who inhabit a more rigorous climate, and having little agriculture have less resource when the surface of the ground is covered with snow. They make no provisions of dry grass, in which we are not altogether to blame them as improvident, for some have scarcely a fixed residence for winter; and the flocks are so numerous, that it would be difficult to provide sufficient provender for all. Some of the Kirghizes frequent the Pamer, which bears a most luxuriant herbage, but by reason of the cold it is not pastured more than a third part of the year. On their return, they feed their flocks in the warmer vallies below, until the heavy falls of snow and severe cold force them to retire to their *kishlaks* in the vallies, near which they have left forage remaining for the wants of winter. The sheep remove the snow with their feet, or if too deep they follow the track of the horse, where he has uncovered the herbage. All the animals drink the snow in this season. It is thus the quantity of herbage and its natural seasons, determine the mode of life of a great part of the population.

123. Pasturage may be divided into two species, the shepherd remaining in one climate, or visiting another different from his own. In warm or temperate climates far removed from any other, he feeds his flocks all the year near his own village, and according to the distance, brings them back to the village by night, or not. In very cold climates when circumstances prevent an access to more temperate ones during the winter, they subsist in that season on reserved pasture, on the grass which has been reaped, or on the straw or other products of tillage. But when in the same neighbourhood there are warm plains and cold mountains or upland plains, nature lays the foundation of a more erratic life, the flocks being driven up in the summer and down in the winter. Sometimes there are constant inhabitants in both the upper and the lower countries. It is thus the Ghiljies, who stay in the elevated country of Cabul and Ghuznee, send part of their flocks in the winter to the various warm countries, from the most southern parts of Daman to Koonur and Jellalabad. In the summer the inhabitants of these countries send a part of their sheep to the upper country, but the proportion is not considerable. Sometimes the

habitations of the people are in the vallies and plains, and they frequent the hills and upper plains in the summer—this is the practice of Kushmeer, Pukhlee, Bhooner and Punjkora. Sometimes they reside in the high country—it is thus part of the Kafirs leave their high hills in the winter to pasture their goats among the low ones, and the declivities. The Afreedies too in general stay in the upper part of their country. During the summer the shepherd shelters himself under trees or rude sheds of grass; in the winter he removes to low hills, where he finds natural or artificial caves in the rocks to receive him and his flocks by night. Some of the Dooranees near the Helbund construct habitations for themselves from the branches of trees and mud. The Dooranees, in general, Ghiljies, and Beelochees live under black tents; the Ymaks, Huzaras, and nations of Toorkistan use *khirgas* made of felt and wood, or *kuppas* made of felt and reeds.

124. Some details might be given of the species of plants found in these countries, but they would be little interesting. A considerable number of spontaneous products form articles of food. The chief are the lotus, the ruwash, some of the fungins, a kind of wild vetches, a plant bearing some resemblance to the turnip, the roots of the tulip, the leaves of the plant in India called paluk,* and the seeds of some of the gramina; other plants are used in medicine, and perhaps we have here something to learn of the natives. Perfumes are extracted from others, for instance from the grass which in India is called Gundhel or Mircheeagundh,† and which according to some yielded the spikenard of the ancients. The well known dool‡ grass of India seems to extend over all these countries, some parts of which moreover have superior species. Two of these called Rishka§ and Shuften‖ are also artificially raised. The Surkunda appears to extend to the utmost verge of our inquiries to the north-west, and it is not so much from the want of proper grasses as from other circumstances, that in the countries of the west a thatched house is scarcely to be found; a flat roof with a balcony, or a vaulted one without it, are substituted. This last expedient is resorted to wherever wood is dear. Of noxious vegetables, there is none worthy of mention except it be the Bhoart. This abounds in the country of Beekaneer and the neighbouring ones, as far as our military station of Lodhiana, the sandy parts of the great Indian desert, and in some quarters of the country between the Hydaspes and Indus. Its seed which is some-

* A species of beet. † Andropogon, nardus vahl.
‡ Panicum dactylon. Linn. § Sueerne. ‖ A kind of trefoil.

times gathered, and even sold at a considerable price, is covered with several sharp prickles, which readily attach themselves to clothes, and are with difficulty taken out. However insignificant they may seem, they are the chief annoyance to a traveller. Beyond the Indus, and a short distance from its banks, we do not find that grass which yields the khus* so useful during the hot winds in India. In these countries tattees are not much used except in the hottest season, and then only by people of condition. The plant employed is the Juwasa† of India, in Peshawar called Jhoy, and by those who speak Persian Shooturkhar, from its being a common food of the camel; besides these uses, in some places it yields manna, for example, the neighbourhood of Candahar and Hirat, and the banks of the Chilchick (see paragraph 45.) This precious substance exudes from it after the spring rains are over, and is collected by merely shaking it off. It is also produced in Toorkistan, on the dark barked or cultivated willow, and from some other plants.

2nd. Of Shrubs.

125. These countries have shrubs and low trees of several varieties and in great abundance. It may be remarked that they are most abundant in unfertile and uncultivated places; whether it be that such is their peculiar situation, or that they occupy places refused by the herbs and succulent plants and by the timber trees I know not. Some insinuate their roots among rocks and loose stones; some grow on the hardest clays and merest sands, and in the driest climates; and others overspread the salty deserts. Though humble, they are however useful, and demand some of our attention.

126. Some furnish food from their roots, barks, flowers, or fruits. The last only is worth mentioning, and the most remarkable species is the barberry, which abounds in the east of Toorkistan, the Ymak country, the skirts of the great northern range, and some parts of that of 34°. It is little cultivated, but that which is raised in Ghaeen is much esteemed. The plant in India called Jhurbeereeat extends to the foot of the hills in the northern and western directions. The Byr, which is said to be merely a cultivated species of the barberry, is raised in Peshawar but not in Khoorasan or Toorkistan, where instead of it is cultivated the Connal, a fruit which much resembles it in taste and properties, and is found wild in the hill of Bajour, in Pukhlee, some parts of Persian Khoorasan, and probably many other quarters. On the low hills in the east of Afghanistan, and those south of Kushmeer, which yield

* Andropogon muricatum. Linn.

† Hedysarum Alhaji. Linn.

berries; such are the goorgoor, moomanee, kookee, simloo, gurinda (the Kurounda* of Hindoostan) and some others. By the banks of streams there is found a plant which bears a fruit intermediate between the raspberry and bramble. The wild grape is found both in the warm and cool climates, but disappears in very cold ones; its fruit is sour, but is sometimes eaten either fresh or fermented. In the countries of the west, sugar being dear, various substitutes are found for it, for example, preparations of dates and other fruits, and a preparation of the sugar melon and honey; but perhaps the most common is what is called Doshab, which is sometimes made of apples or mulberries, but oftener of grapes, wild or cultivated, the juice of which is boiled to a consistence.

127. Where grasses are plentiful, as in Cabul and the cultivated parts of Khoorasan and Toorkistan, a spirit is extracted from them. In the Punjab and Sindh coarse sugar is the chief material from which spirits are extracted, but the inhabitants of the latter sometimes use the date alone, or mixed with sugar, and in the Punjab the same use is made of a fruit called Umlok, which is both wild and cultivated.

In some villages of Cabul a strong drink is extracted from mulberries, and in Kushmeer from pears. In Keerategin, and other parts of Toorkistan, there is a coarse grape called Muska, this they gather, boil, and afterwards dry in the sun. A water melon is now opened at one end, and about nine of these grapes are inserted and forced into the substance of the water melon, which being done, the orifice is shut up by re-applying the piece which had been cut out. In seven or eight days it is found that both substances have fermented, and the pulp of the water melon is converted into an intoxicating liquid fit for home use. But in Toorkistan the favorite liquors are Koomiz, made from mares' milk, and Boza, made from rice; these liquors are both wines, not spirits; they are somewhat acid, and are reckoned wholesome. Koomiz is not considered as coming under the prohibition of the law of Mahomet; but in most of the principalities, especially where the Tajiks bear sway, Boza is strictly forbidden. Although these prohibitions, whether serious or not, are quite ineffectual when they are met by a disposition to elude them, both Koomiz and Boza are less consumed in the great towns than among the pasturing tribes; yet on the whole there is less intoxication among the latter, for the people of towns indulge themselves in opium, the wine of the grape, and

* Carissa Carandas Linn

various preparations of hemp. Not only in these countries but in most others, intoxication is commonest in cities and crowded neighbourhoods; whether it be that company invites conviviality, and conviviality leads to excess, or that the real and imaginary ills of life being more oppressive where population is accumulated, the miserable are driven to this resource to procure a temporary relief in forgetfulness; a review of these countries will furnish no arguments for the common opinion, that climate influences this part of the character. The force of example is much less doubtful, and the colonies of Persians settled in the Afghan dominions still retain the love of wine for which their ancestors were noted.

128. Very many wild shrubs and wild trees furnish materials for dyeing, but the natives seem to have no secrets in this art. The cultivated dyes are chiefly indigo, turmeric, bastard saffron,* and madder. Indigo is unknown in the countries of the west, which are supplied from Mooltan and the neighbouring countries. Turmeric† is raised in Peshawur and many other places on the east side of the hills, but Bunno and Beer, a district of Pukhlee, are the most famous for it. It is not raised in the cold countries, or in the west. Bastard saffron, a more valuable product, is not raised in very warm situations, and indeed seems confined to Kushmeer and Ghaeen. The plant in India called Al‡ is found wild in Bajour and many other places on the east side of the hills, but is not used as a dye, though valued for its cathartic quality. The madder plant does not seem adapted for warm climates, yet some is cultivated in Gunduwah. It is raised at Kilat and Mungoochur, in Bulochistan, and some parts of Toorkistan, but its chief seats are Zumundour, and the country from Cabul to near Candahar. What comes to India chiefly passes through Candahar and Shikarpoor. Logwood, or rather sapan§ wood, grows on the mountains of Kushmeer, but whatever conjectures may be formed, I have found no evidence of its existence beyond the Indus until we reach Mazunduran. Toorkistan is supplied with it and kermes from Russia.

129. For tanning and colouring leather the bark of the almond, the leaves of the Kushnar|| tree, a shrub called Barik, and many others are used. In all cases a lye of lime and alkalies is required. Leather is ill prepared in Afghanistan, and the people of the hills are fond of

* Carthamus tinchorious. Linn.
† Curcuma longa. Linn.
‡ Morinda cihifolia. Linn.
§ Caexilpina sappan. Linn.
|| Bauhinia sp.

wearing shoes of undressed leather. Still simpler are those called Chuplee, woven from the leaves of a plant which the Afghans call Muzir, and the Peshawurees, Putha; it grows to the height of a man, but in general is under that height. It is not found in the cold countries, but extends to a certain height on the east side of the hills, beyond which is Khoorasan and Toorkistan. To the south it is found in some parts of Seeweestan, and to the east it is not known beyond the longitude of Husan Abdal. It is of the palm kind, and perhaps is yet undescribed. It bears a small fruit, which ripens in July. An Afghan will make a pair of chuplees in a single hour during a halt; they are tied on the feet like sandals. The Kushmeerees make sandals of rice straw.

130. The Assafœtida* plant is produced in great abundance towards the source of the Ghorbund river, and also near Isfizar (which is three days from Furah), and some other places in the west of Khoorasan. It prefers a cool climate, and the only cultivation bestowed on it is to shield it from the sun. Assafœtida is more consumed in India than in the countries of its production, where however it is used in food and also medicinally. Many other shrubs furnish articles for the native materia medica. Blisters are made with the leaves of Kureel, a plant well known in India and also in Peshawur. The plant called Ak† or Uk, has a white corrosive juice, which the Rajpoots give to their infant daughters as a poison, when they do not intend to bring them up. This plant yields charcoal, and is good in tanning, dyeing, and pharmacy. The sacred Toolsee‡ is found in all these countries among shrubs famous for the beauty of their flowers, but the most remarkable is that called by the natives Urghuwan, or Anemone shrub. It grows in some parts of Cabul, Budukhshan, and Durwaz. In Durwaz it grows to the height of twenty feet; spears are made of its wood, and it is a common fuel.

131. Shrubs are the chief fuel in these countries, generally considered, though there are some districts where more use is made of forest timber or the branches of large trees, and others in which the chief resource is the dung of animals. Caravans sometimes find a difficulty in procuring fuel at uninhabited stages, but few towns can be mentioned where this article is dearer than in our provinces. It is dear in Candahar and Cabul; and in the latter a great quantity being required, it forms an important part of the expenditure of the poor.

* Ferula Assafœtida. † Asclepias gigantea. Linn.
‡ Ocimum sanctum. Linn.

The rich Cabulees chiefly burn the wood of four trees—the mulberry, mastich, oak, and bullhuk, a tree so called in Cabul, and by the Persians *kurghuna*. The poor content themselves with a fuel of shrubs or dung, and the dung of horses is eagerly carried away from the streets. The pasturing tribes bring the dung of sheep for sale, which in the city is used as fuel, but in the villages as manure for grapes. The capital was a good deal distressed in the winter of 1801, when the Ghiljies of the neighbourhood interrupted the usual supplies of fuel.

132. In the Indian desert there is abundance of the plant which, after the Arabians, we call Kali, and the same is found in some other quarters. By the Persians it is called Ishkar, but I apprehend this name is given to some other alkaline plants, particularly to that known to the Hindoostanees under the name of Lance, and which is plentifully found in the Indian desert, and also in the wastes of Khoorasan, Bulochistan, and Toorkistan. In these quarters are at least two other plants of an alkaline nature; the pasturing tribes wash by means of the leaves and flowers of these plants. The Lance is thus used in Jellalabad. A common practice is to burn them and use their ashes. Near the Indian desert great use is made of the ashes of Kali, and many in Toorkistan and Khoorasan use those of the Lance. By the addition of fat a true soap is formed, and this is preferred by the more civilized part of the population. The soap of Hindoostan is superior to that of all those countries, but Toorkistan and Bokhara are noted for this manufacture. In Kushmeer and Bajour meal of the Oord is substituted for an alkali, but in all cases a proportion of lime is added.

3rd. Of Trees.

133. The trees best known in India, for example—bamboo, mangoe, tamarind, neem, bukaen, seesum, sal, the banyan tree, peepul, firs, peeloo, kudum, lusora, bēl, jamun, khinnee, kuchnar, umlats, tota, semur, pakur, moursuree, senjhna, jand, dhak, babool, kyr, burhur, kuthur, aoonla, gondee, kumrukh, toon—are quite unknown in Cabul or the countries beyond it, and very few of them are to be seen in Kushmeer or Peshawur. The bamboo is not known beyond Khanpoor of the Gukhurs, nor is it found in any part of Sindh, or even of the Sooba of Ajmeer. The mangoe is cultivated in Sindh, but Tymoor Shah unsuccessfully attempted to introduce it at Peshawur. The mangoe is cultivated at Keech, in Bulochistan. The plantain does not bear fruit beyond the 33rd degree of latitude; it is unknown in the cold countries, and does not extend far into Bulochis-

tan. The tamarind and neem become rarer as we leave our provinces, and are unknown in Peshawur, as are the kudum, bēl, khinnee, tota, moursuree, jand, kyr, burhur, kuthur, kumrukh, dhak, and some others. In Jellalabad are lost, in addition to those, the seesum, banyan tree, peepul, lusora, jamun, kuchnar, umlats, semur, senjhna, babool, peeloo, aoonla, and some others. The date tree reaches Jellalabad, but extends no further in this parallel. In the south it extends through Bulochistan into Perna; and in Bulochistan it is very abundant, and a main support of the population. In Kilat however it is not found by reason of the cold, nor is it seen in Toorkistan or in any part of the north of Khoorasan.

134. In India gum is extracted chiefly from various species of the genus mimosa, which includes the kyr, babool, jand, and chhokur, of which the last only reaches Peshawur, but there is a species of mimosa, bearing a great resemblance to the first, but not found in our provinces. It is very common on all the low hills between the Hydaspes and Indus, and is called Pholoo, and yields gum, which besides being useful in medicine is sometimes eaten. It does not grow in the cold climates. It has been used with great advantage as a hedge round a fort. In Cabul and the countries of the west where none of this genus are found, gum is extracted from the cultivated trees of orchards, the jujube tree, the wild almond shrubs, and the mastich. In Toorkistan the gum mastich is used for fixing colours in the dyeing of chintz. These are not the only trees from which gum is extracted both towards India and in the west. The jujube is not seen east of the Indus, perhaps is not seen east of the valley of Cabul, but there, and in the west, it exists both wild and cultivated. The mastich is not very abundant on this side the Indus, but beyond that river it is found on most of the hills, except the warmest, and it bears the cold of the Huzara mountains. To the west it extends to Persia, and in a northern direction it crosses the Jaxartes. It is seldom found far from hills.

135. There is a certain plant in Toorkistan, and elsewhere, which is called Seehuk, and its roots yield a coarse resin. The pine species yield the best, and tar is also extracted from them. In remote situations it is more common to rive the tree with wedges than to saw it into planks. Pines are not found in all situations even of the cool countries, but prefer the steep sides of hills, never being found indigenous to plains or tame featured hills. There are some now growing at Herat planted by the late Nooa Moohummud Babunee. They are plentifully found on the sides of the great northern range, and the Bebur.

(with their various branches of a steep character and moderate height,) in the middle of the range of 34°, in nearly the whole of that of 32½°, in the beginning of the salt range, on the mountain called Tuchti-Sooliman, on the lofty mountain Bunseekurn, and the Jadran range, on the Ootman Khel hills, on the Aktan hills in Toorkistan, and some of the mountains of Chinese Toorkistan. Pines are also found in some spots of the Kokur country; Cabul is supplied from the mountain of Kulkucha, about three days to the east. Bameean, Ghuznee, the Huzara and Ymak countries have no pine trees. Some are found in a few spots of Bulochistan. The natives distinguish at least seven kinds, but all are not found in the same quarters. Toorkistan and Kushmeer do not seem to possess that species which is called Julghoza, and which bears a large cone, the seeds of which are idly supposed to possess many good qualities. Another species by the Afghans called Shouty, is remarkable for its being so combustible that the natives use it as a torch; this too seems unknown in Toorkistan. I have received no hint of the larch or any other deciduous species of the pine being found in any of those countries. It may be observed, that the fall of the leaf does not take place even in the same species at one time in climates so different. In Peshawur most trees retain their leaves till near spring, but in Cabul, Khoorasan, and Toorkistan the autumn frosts shed the foliage.

136. Evergreens, besides the pines, are but few. It may be conjectured holly grows on the lofty mountains, but I have never received any hint of it. The cypress is chiefly known as a cultivated tree, but is found wild in some situations. Excepting it, the natives reckon the chinar or sycamore, the most beautiful of trees. Some are found at Lahour, but are certainly not indigenous. There are two species, the Chinar or Sufeda, which has a broad shade, and the Punja-chinar or Sufedar, which grows slender and tall. The Chinar is indigenous in Kushmeer, Khost of Bunnoo, Goorzwan in the Ymak country, Durwaz, and various other situations. It prefers a moderate climate inclining to cold, deep valleys, and a moist, fat soil.

137. The same situations are most favourable to willows, but some of them are seen growing in all climates, from the plain of Peshawur to the country of the Huzaras. This is perhaps the only tree which withstands the cold of the Pamer. The willow is banished only from the hot and dry plains, and some peculiar situations. There are several species, but four are the most known, viz.—the weeping willow, which the natives call Mujnoon, and value for its beauty, the Bedi Mooskk from which is extracted a perfumed water, the green willow which is the commonest of all, and the red, which grows straight and

tall. The two last are used in building, chiefly for rafters of houses, and insects do not eat their timber. All the four species are cultivated, though some more than others. In Kushmeer and some other places the twigs of willows are given to cattle. In none of these countries are osier baskets made.

138. It is probable that the high mountains have some English trees which we cannot identify from the descriptions of the natives. The birch is plentiful in Kushmeer, and also many places of the Belur mountains, yet its bark is imported from Russia into Bokhara, where it is used to stuff saddles—an article there manufactured of good quality. The only species of oak is that known in systems by the name Quereus Bilote, which does not become a great tree. It is not found in Khoorasan, or Toorkistan, or in the warmer countries towards India; the Cabulees call it Buloot. I know not what are the trees called Seah, Chob, Bulhuk, Pudda, and Gurung.

139. The mulberry grows wild over a vast expanse of country, yet is rarely seen in the plains. It grows in the vallies of all but the warmest hills. Its fruit is much improved by cultivation, and it has varied into at least twelve varieties, all of them good. There is a difference in their ripening, but the mulberry harvest generally speaking coincides with that of wheat and barley in the same climate. In various parts of Toorkistan the mulberry is very important to the natives, furnishing a fruit, a doshab, and when preserved a considerable article of food. Now here is it so important as in Punjsher, where the natives grind it into flour, and this forms the chief food of the country. The mulberry plantations are so extensive that they are not walled in, and some individuals are said to possess ten thousand trees, but this seems an exaggeration. A very good tree will bear ten maunds of mulberries, and if the average produce be one-third of this, it is calculated to support a far greater population than tillage. The produce is little affected by the seasons and is remarkably equable.

Silk is not made except in certain quarters. Kushmeer raises enough for its own scanty consumption, but Peshawur and other countries of the east are supplied from abroad, chiefly from Goojrat, and our provinces. To the west the first place which produces silk is Gundumuk, in a temperate climate between Cabul and Jellalabad, but there is none in Cabul or Ghuznee; considerable quantities are raised in the Afghan Khoorasan, but less than in the Persian part of the province and in Toorkistan. Great quantities are raised in Khootun.

140. The pistachio tree is confined to Toorkistan and that side of the Paraparnisan which lies towards it, but it is little cultivated. The wild

almond shrub (which when cultivated attains a great size) is very common in many places, but its fruit is not eatable. An oil esteemed in medicine is extracted from the stones both of this and the cultivated sort. The oil of walnuts is so cheap in Kushmeer, that it is more used in food than any other oil or fat. The tree requires a colder climate than the mastich, but like it is found in the very cold ones. Where it is naturally very abundant, it is not cultivated. A good tree in perfection will bear, it is said, forty thousand walnuts in a season, and two thousand in Cabul fetch a rupee when cheap. The wood is good for some purposes, by reason of its strength and hardness. The natives are not accustomed to use olive oil in their food, but apply it to medicinal purposes: this plant grows on most of the low hills. Though it is not found in Cabul, Toorkistan, or Khoorasan, it is plentiful in some places between the Euxine and Caspian.

141. Nearly all the species of fruits cultivated in these countries are also found natural in some parts of them, chiefly in the vallies of cool and cold mountains. These are the apple, pear, cherry, plum, apricot, peach, quince, and pomegranate. The fig, though found in most of these climates seems yet to prefer the warm. The *naring*, a species of wild orange, grow on the hills south west of Kushmeer.

142. Of these countries Kushmeer has probably the greatest variety of indigenous species, and is at the same time as well wooded as any. It may be remarked that the same situations are generally well wooded which have been already described as favourable to the pine (see paragraph 135), the steep sides of hills being favourable to its growth, whether it be that forest trees love shelter, or because they are here best secured from animals. The low hills are not so woody as the high, being more affected by shrubs and low trees of little use as timber, than by forest trees. On the whole these countries are but ill wooded, though superior to Persia. Toorkistan, excluding the deserts of the west, is on the whole superior to Afghanistan, and the northern part of that country to the southern Bulochistan has very little wood. The plains of these countries have naturally but few trees and (contrary to what takes place in most countries of Europe) they become better wooded with the progress of cultivation. Few of the natives plant for timber, but a good deal is yielded from the numerous orchards of the countries of the west, which have been planted for fruit.

(To be continued.)

which is peculiarly visible at the present juncture of affairs with that power. Maulmain being the main point from which an invasion and conquest can easily be accomplished, without being obliged to plunge at once, as in the last war, into the hostile territory.

3. Their natural wealth consists, in a number of valuable productions, unknown at the first time of their occupation, and which are more or less wanted in India, such as tin, iron, coal, teak, and other valuable timber, and a host of other minor productions.

4. They afford the best possible field for European enterprize, being adapted for every kind of tropical cultivation, affording therefore the greatest inducement to make them the resort of Europeans.

ART. II.—*Memoir on the Climate, Soil, Produce, and Husbandry of Afghanistan and the neighbouring Countries.—By Lieut* IRWIN.[1]

PART III.

SECTION, III.—*Of Animals.*

143. These countries have for the most part the insects and reptiles, noxious or otherwise, of the neighbouring ones, and present in this department little subject for remark. The warm and moist, abound the most in flies, musquetoes, and scorpions. Peshawur is famous for the last, but their bite is not mortal. During the spring months flies are very numerous, but before midsummer they are greatly diminished. White ants are but few, and in Cabul and the west, there are none. The musqueto is only troublesome in Cabul for about forty days of midsummer. Khoorasan in general is a dry and temperate country, and has few musquetoes; but there are exceptions to the rule, and particularly Hirat and Seestan. The musqueto of Seestan is remarkably large and troublesome. It is pretended they are produced in the fruit of a certain tree, which is, however, not peculiar to that country. To escape their attacks, the natives sleep in what they call pusheekhanas, which are made of the cotton stuff, in Hindoostan called guzee, and which is either made in the country or imported from that to the west. The horses which have not this defence, are so severely bitten as to bleed from the effects, and roll themselves with the pain. The end of summer and the autumn is the season of the musqueto there, as in most other places. Wasps are most numerous in the cold countries. Snakes are found in all except the very coldest, but most of them are innoxious Futihabad, between Jellalabad and Cabul, abounds in

[1] Continued from p. 900.

venomous snakes. The locust is found in these countries, but commits the greatest ravages in the warm ones and the open plains; it is commonly observed that they are brought by an easterly wind. Two seasons are yet well remembered in which these insects ravaged a part of Khoorasan. They have visited Cabul in this manner but once in the present generation.

144. The wild bee, of the kind which we have domesticated, is a stranger to Cabul, Khoorasan, and Toorkistan. Its nests are very common in the woods of Kushmeer, and beyond the Indus we find them as far as some parts of the Kafeir's country; in the south they are plentiful; at Bels, on the borders of Bulochistan, they are made on the branches of trees or shrubs, in the clefts of trees, or even on the ground, and contain as far as 30lbs. of honey and wax, but the average is only one-third of this amount. In the warm climates are two seasons of honey, one in May another in October, but the latter only is known in the cold. Two kinds of bees are distinguished, a smaller and larger. The larger has been chiefly domesticated in Kushmeer. A large earthen vessel is built into the wall of a dwelling house, care being taken to turn the mouth inwards, and to perforate the bottom of the vessel, by which means the bee shall have access to it from without. The mouth of the vessel is shut up, but so, that the owner may open it when he intends taking his share of the honey. Things being thus prepared, a colony of bees are introduced, and being fed on sugar, soon become reconciled to their dwelling. At the proper season the owner takes his share of the honey, and leaves a portion for the sustenance of the bees. The Kushmeerees leave them very little, but make some amends by introducing from time to time boiled pitha as their food.

145. Fish are an important article of diet only in Kushmeer, Sindh, and the neighbouring coast. The species known in our upper provinces, for the most part are found in the rivers of the Punjab and at Peshawur; in Kushmeer, however, the alligator and that other more dangerous animal which the Hindoostanees call *mugur*, never appear to enter the river, nor are they known in Khoorasan or Toorkistan. Khoorasan has few fish, even if we comprehend Seestan and its lake.

146. This lake is more noted for fowling than fishing. Among its reeds are great numbers of a web-footed bird, which the natives call ghoo, and catch in nets solely with a view to its feathers, which are used in stuffing pillows, and for other purposes. In all these countries ducks are found in a domestic state, but never in great numbers. At Tashkund geese are kept. The common fowl is much kept by the

pasturing tribes. In Bajour, the whole of Toorkistan, especially Bulkh, and some other quarters, this bird is found in a wild state. The chief prey of fowlers is the bird in India called chikor. Some Indian birds are not to be found wild in Peshawur, far less beyond it, for instance the peacock, and that which the English call the adjutant. The parrot and myna are scarcely natives of Toorkistan, or at least of the country beyond the Oxus.

Quadrupeds.

147. The brown ground rat of India is well known in many quarters of Khoorasan and Toorkistan. It prefers a sandy soil, and is a formidable enemy to growing or ripe crops. The musk rat perhaps does not extend to Cabul. The cold countries of Toorkistan and Khoorasan, excepting Hirat, have not the squirrel. The monkey and mungoose are also not found in the same countries, except in Kushmeer, to which the mole seems confined. Hedgehogs, porcupines, turtles, and tortoises are generally diffused, as is the hare. White hares are chiefly found beyond the Jaxartes. In Cabul only is the hare kept in a domesticated state, and they may be purchased in the market for eight annas. The rabbit is not found in these countries, India, or Persia.

148. A variety of the cat is bred in Cabul, and some parts of Toorkistan. By us it is very improperly called 'Persian,' for very few are found in Persia, and none exported. The Cabulees call this cat bubuk or boorrak, and they encourage the growth of its long hair by washing it with soap and combing it. With respect to the other species of the cat genus, the tiger is found as far as Tashkund, but in that temperate climate he falls much short of the Bengal tiger in strength and ferocity. The lion is a native of Persia, and some are found as far as Tashkund, in a northerly direction and in an easterly. There remains no doubt of lions being found in Hurriana; but in many of the intermediate countries this animal is very rare. Neither the lion nor tiger is found in the cold climates, such as Kashkar and the Pamer. Leopards seem to prefer cool hills. They are very common in the Kohistan of Cabul, but they do not attack men.

149. The wolf attacks man only when urged by excessive hunger, and hence is the most formidable in cold countries and severe winters. The jackal is known every where, except in the coldest and driest districts. The fox of Toorkistan, and generally of the cold and temperate countries, has all the cunning of the English, unlike the puny fox of India. Chinese Toorkistan is the only market worth

mentioning for peltry, and thither are carried from independent Toorkistan, skins of the common brown fox, the black fox, the sable, the ermine, the beaver, and some other fur bearing animals. These are partly known in Khoorasan and Persia, but (except the brown fox) are not found in Cabul or Afghanistan in general. From Toorkistan are also carried the furs of young lambs, the best of which reach the court of Pekin. The lamb must be killed when a few days old.

150. The Mahomedans reckon the bear impure and forbidden, but find several uses for his skin. He frequents the vallies of cold hills, and especially if they possess a stream. In Kushmeer there seems to be two species, the yellow and black. He is scarcely found among the detached hills of Khoorasan. The hog prefers the plains, especially if shrubby. The Hindoos sometimes eat his flesh in secret. The Kafeir's alone eat bears. In Toorkistan young horses are fed up to be slaughtered, and the onager, where found, is eaten. The rude tribes eat flesh in general in a half boiled state, and sometimes raw. The ass and mule are no where eaten.

151. Among quadrupeds, the chief game are the various species of wild goat, antelope, and deer genuses, which pass into one another in such a manner that there is great difficulty in identifying the species from description. The goats inhabit the mountains, the antelopes and deer prefer the plains. Khootun is famous for its musk deer, which are known to be found in some parts of Tibet and on the Pamer. An inferior kind of musk is brought from upper Swad, or perhaps the country beyond it to the north. With respect to what the natives call wild sheep, they cannot be of the same species as any of the domesticated kinds, but are probably what zoologists call *ovis ammon.*

152. There is no reason to believe the existence of wild horses in any of these countries. The animal which the Persians call *goorkhur* is, I presume, the onager, or wild ass of naturalists. This animal is of incomparable swiftness but may be killed by art. He is common in Persia, the western part of Khoorasan, and the plains of Toorkistan, from which he extends north into the Russian dominions and the centre of Asia. A few are kept by the Ymaks more for curiosity than use. Before proceeding to quadrupeds strictly domestic, we may mention the *bos grunniens,* or ox of Tibet, which is found in a wild state on the Pamer and the upper parts of Budukhshan, and has also been domesticated by the Kirghizes, who frequent the Pamer. They keep a few of the common kind, but many more of this species.

Domestic Quadrupeds.

153. The horse of Toorkistan has long been famous, and forms the chief article of export from that country to Afghanistan, India, and Persia. From certain quarters in Khoorasan (chiefly the north-west) horses are exported to the same countries, but in less numbers. In both cases it is chiefly the pasturing tribes who rear this animal, which is but rarely housed even in winter, or in the cold country of the Ymaks; they are not very numerous in Bulochistan, neither are they found of remarkable goodness either in that country or in Afghanistan. In the neighbourhood of Bameean however, and some other parts of the north, is a breed of very strong and serviceable ponies. Those of Tibet are broader, smaller, and stronger. In the country of the Yoosufzyes, and some parts of the country between the Indus and Hydaspes, in Bunnoo and Daman, we find a breed of Tazee horses, which are much esteemed. Horses in Kushmeer are neither numerous nor good, but there are considerable numbers of ponies.

154. The ass gradually improves as we proceed westward from the Company's provinces. Perhaps the best are those in the west of Khoorasan, but even these are much inferior to the Arabian or the Spanish. Asses are imported into Cabul from Bokhara and the north-west of Toorkistan. Mules are scarcely raised in Toorkistan, the best are bred in Khoorasan; a slender species, but yet hardy, is bred in Pothwar and the neighbouring districts. They are raised in the vallies of Jajee and Foree, in Teera, and some other places.

155. Tibet, Kushmeer, Kashkur, Keerategin, Durwaz, the upper parts of Budukhshan and the Huzara country breed no camels, being too cold, moist, or rugged, for that animal. Beyond the Jaxartes is the two humped species, in the Toorkee language called *uzhree*, and by our writers, (I believe) Bactrian; his height is far less than that of the Indian camel, his hair longer, he is not capable of bearing severe heat, and is not easily naturalized even in Bokhara. In the kingdom of Kokun he is the prevalent species, but in some places neither is known. The camel called *bughdadee*, has also two humps, but his height is equal to that of the Indian. He is found chiefly in the south-west of Khoorasan, yet even there is much out numbered by the Indian species. This species is very abundant in the whole of Bulochistan, in Sindh, and the borders of the Indian desert. In those countries soldiers are often mounted on camels, and some breeds are remarkable for their swiftness. The camel of Ghuznee and Cabul, originally of the same species, is now somewhat changed in his properties by the climate; he cannot bear the winter cold of these

countries, and probably exceeds the Indian camel in strength, but yields to him in patience of thirst and hunger. With respect to appearance, he is not so tall and slender in his limbs.

156. The Punjab, Sindh, and the Indian provinces of the Afghan monarchy considered as a whole, have cattle nearly in the same proportions as in our upper provinces, and the quality is not very different. In the detail we find great differences, the cattle on the west side of the Jumna are superior to those on the east, the oxen of Nagour and cows of Hurriana are much celebrated, even the cattle of the Punjab are probably superior to those of our provinces east of the Jumna ; those of Peshawur are certainly inferior, and the cattle of Sindh are not remarkably good ; yet great numbers of them were carried from Buhawulpoor by Tymoor Shah's army to Cabul, where the breed is still perceptible. The native breed of Cabul yields the most wretched bullocks, but considerable numbers are every year brought from Nasour by the Lohanees, and others who travel on the southern road to India. Cattle are brought to Peshawur from the Doval of the Hydaspes and Indus. In Seeweestan cattle are not numerous or good. In the middle and west of Afghanistan and in Khoorasan, they constitute no very considerable part of the national wealth. Being kept by farmers, their numbers are in proportion to the village, and hence they are more frequently found among the hills. The pastoral tribes of the open country keep but a few bullocks to carry their tents, the cow is therefore usually house fed, or fed on meadows and gardens near the village. Round the lake of Seestan, however, are seen great herds of cattle, which pasture on the marshy grounds. The cows of the west in general give more milk than those of our provinces, and in the Ymak country some give as far as fifteen seers; a very small breed kept by some tribes of the Kafeir's gives as far as twenty seers ; the cows of Kushmeer give a great deal of milk of a poor quality.

157. The buffalo is not fitted for cold countries, hence he is scarcely to be seen in Kushmeer, notwithstanding its moistness; and by far the greatest stock is in Poonuch and Rajur and its other dependencies to the south, which have a much warmer climate. Far less is the buffalo suited to the climate of Cabul, which is both colder and drier, yet in both countries diligent search would probably discover a few. Buffaloes are numerous in some parts of the Punjab, and they give more milk than in the Company's upper provinces; as far thence to the north and west as the warmer plains and vallies extend, this animal is bred, but according to circumstances in greater or lesser

numbers. In Seeweestan sheep are the favourite stock, and in the Daman, cows. In the warm parts of Pukhlee buffaloes are very numerous, and in Swad and Bhooner they constitute the chief stock, yet are buffaloes not used for carriage in those countries. Beyond Jellalabad and Lughman, buffaloes are scarcely seen. The climate of the warm parts of Toorkistan and Khoorasan is certainly favourable enough to this animal, which is yet in a manner unknown; some are indeed seen near Candahar, and a few years ago several were kept in the neighbourhood of Milkh. The buffalo probably extends from the delta of Sindh, west, along the coast of Bulochistan; but the whole of the inland parts of the west, and the whole of the hilly tracts of Bulochistan are destitute of this animal.

158. Sheep are kept in all these countries, nor does there appear to be in Bulochistan any tribe which depends on camels alone, like the Arabs of the desert. The sheep are of two breeds, easily distinguished; the heavy tailed (called doomba), and the light tailed. The latter species is that found in India, and thence extend west into Sindh, and part of Seeweestan. The sheep of the Daman are generally of this kind, which also prevails nearly to the utmost limits of Pothwar. In Kushmeer, Tibet, Kashhur, most parts of upper Budukhshan, and among the Kafeir's, no other is known. In such a tract of country many varieties must occur in appearance and value; the finest wool seems to be that of the Indian desert, and the Rajpoot country. The doomba is found in all the other countries; and is the prevailing species in Persia, with the exception of Geelar and Mazundarum. The doombas of Toorkistan, and particularly that bred by the Kuzzahs is very large. The doomba seems a superior species to the Indian sheep; the wool on an average is equal, the carcase larger, and the flesh richer flavoured. The lamb is reckoned one of the delicacies of the spring season. The pasturing tribes of the west do not in general suffer the ewes to lamb twice, but where sheep are kept by farmers in small numbers an autumn lamb is dropped, which however does not thrive so well as the spring one. In Kushmeer, the environs of Cabul, and most other places where the sheep are housed in the winter, only one lamb is had from the ewe, but in the upper parts of Budukhshan a contrary practice prevails.

159. Every flock of sheep ought to contain a few goats, which lead the way in pasturing. In some countries goats and sheep are nearly equally mixed, but some situations are so steep and rugged, that sheep cannot accompany the goats. Where it is practicable to keep them, sheep are a more profitable stock. The goats of these countries present

some striking varieties; black is the most common colour, but those of the mountains from which issue the Beah and Sutluj are generally white. The goats of the Kafeir's have sometimes very long horns, curiously twisted; those of the Wuzurous have sometimes long horns, and each horn twisted as it were round itself, like the pillars of Jewish architecture. In that great range of mountains from which the Ganges and Jumna flow, we find even as far as the left of the Indus a breed of goats of great size and strength, and the natives employ them to carry commodities on roads not practicable to any other beast of burden.

160. In the Punjub the same animals are employed for carriage and burden as in our provinces, and the properties are nearly the same. Elephants, become rarer and rarer as you proceed westward. Beyond the Indus an elephant draws as many spectators as an European. In the Doab of the Hydaspes and Indus, mules are a good deal used for carriage. In Sindh, the countries bordering to the east of the Indian desert, and Bulochistan, camels are the chief beasts of burden, and are cheap and good. With respect to the other countries, we are to distinguish carriage as it may be, 1st, that of armies; 2nd, that of caravans or of persons making distant journies; 3rd, that of farmers on their own farms, or for the supply of provisions to towns, or distribution of town manufactures in the neighbourhood, or the interchange of commodities, within small or moderate distances. The chief carriage of the Persian army is by mules and strong ponies. The latter are by no means so esteemed as the former, yet by reason of their cheapness are actually found in the proportion of sixty or seventy to one hundred of the whole. All other carriage is but inconsiderable. Bullocks are not used except for dragging artillery, a use they are also put to in the Doorany army. In both countries it would be much more advisable to employ horses. Certain of the Loor tribes employ asses, and officers of rank who may have heavy baggage keep some camels; were it not for these last, the motion of an army would be scarcely impeded by its baggage, for the camp followers who do not in number exceed the fighting men are almost to a man mounted on the sumpter animals of their masters. This constitution of their army must alone give the Persians infinite advantages in a war with Hindoostanee forces, incumbered with multitudes of timid attendants, and impeded by a sluggish baggage. The Afghans, intermediate in situation between those two nations, adopt in part the usages of both, in this important particular, camels however are certainly the chief carriage of their army, which generally makes slow marches. On oc-

casion of emergency, however, it is known to leave its baggage behind and make very long ones. The small armies now on foot on the sides of the various competitors for the throne use, it is probable, more mules and ponies than camels, and perhaps many years may not elapse before the former species of carriage gain much ground; the poverty alone of the soldiery now prevents its more general adoption. Runjeet Singh has made some progress in providing mules for part of his forces, but his situation is not favourable for procuring those of the most serviceable kind.

161. For long journeys the camel is the most economical carriage, and in caravans they outnumber all other animals. There are however some exceptions; the trade to Chinese Toorkistan from whatever quarter, seems to be conducted by means of ponies and horses. Commodities brought by the people of Toorkistan to Cabul are almost all on horses, but such of the inhabitants of this side of the mountains as trade to Toorkistan mostly use camels. The trade from Peshawur to Cabul, and Cabul to Peshawur, is carried on by means of all the various beasts of burden in the country; perhaps an equal weight of commodities is annually transported on camels, mules, and ponies. Some bullocks, originally Indian, bring loads from Cabul, but seldom return, being readily disposed of in Peshawur. Bullocks are little used for long journeys, except in the cases already mentioned (see paragraph 160); a few attend the army besides those of the artillery. With respect to the third species of carriage, it would lead into great details to particularize the usages of all the various districts, for within a short distance is often the greatest diversity of practice. On farms, in a vast majority of cases, the chief carriage is by bullocks. The intercourse between the towns and the neighbouring country, is as much by means of other animals, except in the quarters towards India. The wandering tribes in general have their tents carried on camels, but where, as in the west of Toorkistan and north-west of Khoorasan, they drink from draw-wells, the leathern bucket for drawing water is carried by an ass or a bullock. The tents of the Ymaks in general are carried on ponies and horses, but the Jamsheedus use a good number of bullocks. In the upper Sindh and lower Punjab, asses bring the greatest part of the fuel into towns. Asses bring great quantities of grain from Bajour into Peshawur; in the former country camels are scarcely known, although the soil and climate is not unfavourable; there are still fewer in the moist country of Koonur; asses are of much use in the internal traffic of both, and in the country of the upper Mihmuds. In the plain of Peshawur, bullocks are mostly used in bringing grain

to the town, but camels and mules are employed in longer journeys. In Puklee many mules are used. The internal trade of Toorkistan is chiefly by ponies and horses. In some parts of the east asses are much used, but in Keerategin men transport the greater quantity of goods. Nor is that species of carriage peculiar to this country, but is known in Budukhshan, Durwaz, Kushmeer, and in the countries within the great mountains which bound India to the north. A considerable proportion of the goods carried from Peshawur to Kashkur through Bajour or Punjokhora are for some distance conveyed on the backs of men; it is needless to observe that the roads are of the most difficult kind.

162. The animal most commonly used for ploughing in these countries is the ox, and in some of them no other is used. A circumstance which greatly recommends them, is that no other servant is required besides the drivers, whereas for all the other animals a man is required to lead. On the other hand, a single bullock is but very seldom found equal to this work; but where the soil is light, a horse or camel is sufficient, these have also the merit of greater celerity, which may in some cases be much required in farm management. Accordingly horses are in part used over most of the open parts of Toorkistan, and by the Ymaks. In Muro scarcely any other animal is used. The use of horses in the plough, perhaps, extends to some of the other parts of the north of Khoorasan, but in all other quarters of that vast country it seems unknown, and in the other countries under review, I presume very few instances of it are to be seen. The Khirghizes plough on the Pamer chiefly by means of bullocks of the Tibet species, already mentioned, but in other quarters they use camels. The Kuzzaks employ camels almost solely. The Tureens and Buruhes use both camels and bullocks. A proportion of camels is used in certain parts of the Kokur dominions, and a few in Seeweestan. In Beekaneer and the neighbouring countries, camels are used, but not so much as bullocks. It may be presumed that camels are much employed in the warm parts of Bulochistan, but among the hills bullocks are almost solely yoked. In the neighbourhood of Mooks and Abilazee, places in the road between Candahar and Ghuznee, it is not uncommon to see the fields, which are commonly light, but with a mixture of stone, under plough by a couple of asses. In Seeweestan two asses are sometimes yoked.

163. Bullocks most commonly draw water, whether it be fetched up by a rope and leathern bucket, or by the action of a wheel. Yet are camels sometimes used in the country of Beekaneer, and in others in or near the Indian desert, and always with good effect, one bringing up the bucket from the deepest wells. The Toorkmuns near the Oxus,

water their fields (for they are not ignorant of agriculture) by raising water from cuts which are made from that river, and in this operation they usually prefer the wheel, with a band of water pots, and yoke camels. Such wheels are, towards India, sometimes seen turned by buffaloes. In such quarters of Toorkistan as horses are yoked to the plough, they are also made to draw water, and camels are in use for the latter as well as the former. With respect to the treading out corn, the same animals, camels excepted, are used, as in the respective places where they are yoked to the plough, cows however, although useful in treading out, are scarcely so in ploughing. Goats too may sometimes be seen in Pushing, assisting in the former operation; which in Cabul, Khoorasan and Toorkistan is not always effected by the feet only of the animals, but by the addition of some simple machinery.

164. It must excite surprise to learn that carts are unknown in the greater number of these countries. In the line of the Embassy's march to Peshawur, they were found not to extend to the right of the Indus. There are few, perhaps none, in the dominions of Mohummud Khan on this side the river, but to the south they are used in most parts of Sindh as far as we may suppose their use demands. Carts are but little used in Seeweestan, and not at all in any part of Afghanistan, the remainder of Bulochistan or Khoorasan. In a westerly direction we may proceed nearly to the Hellespont before we see any. Neither are any found in Toorkistan on the south of the Oxus (with one exception) Bulochistan, Kashkur, Keerategin, Durwaz, the Pamer, Kushmeer, or most parts of the Dooab of the Hydaspes and Indus. In the neighbourhood of Bokhara, Orgunj, Samarkand, and Kokur alone are carts used in Toorkistan beyond the Oxus. In Bokhara they are not employed for all the purposes they are applicable to. In this particular, as almost all others, our information is very scanty respecting Chinese Toorkistan. I have been lately informed that carts are very much used in that quarter, and some have as many as six horses yoked to them. The Chinese in Yarkund and the other cities use buggies and tandems, not unlike those of the English, hence there is some probability that the use of the humble, but more useful species of wheeled carriages is not unknown. In most parts of Toorkistan, and probably in many other quarters, great use is made in rural operations of a machine which seems to be a sledge.

(To be continued.)

A. Certainly, I saw it plainly, and could point it out to you.
Q. Is there much of the ore?
A. Yes, it is a mountain, and you could get any quantity.
Q. Are lead and antimony found there, (Shisa? Soorma?)
A. Yes, in abundance, the latter is exported.

From the foregoing information, it appears to me, that no doubt can exist respecting the existence of copper in the vicinity of the Kunnaraj river, and Bela.

Firstly, Because the guide heard such a report at the spot from the people of the place.

Secondly, Because it was known to the native Sukkaramdass.

Thirdly, Because I have conversed with a person who declares he has been there, and because it is well known to more than one person, that he had procured copper and sold it at Kurrachee.

This statement is clear and distinct, and I think at least worthy of notice and inquiry, if not of implicit belief.

P.S. I have been promised specimens of the ore, and that it shall be melted in my presence; when brought it is my intention to weigh the ore, and ascertain what proportion of copper it yields.

Memoir on the Climate, Soil, Produce, and Husbandry of Afghanistan and the neighbouring Countries.—By Lieut. IRWIN.[1]

PART IV.

Husbandry and Cultivation.

165. It was originally my intention to have attempted a treatise of considerable length on this subject, in which would have been mentioned all the cultivated products, as far as ascertained, of all the districts. To this would have been added an account of the operations of agriculture in some of the most interesting and best known of them, with some details of the life of the poor. Various reasons now withhold me from this attempt, and among them the chief is the want of time to execute it with

[1] Continued from p. 1015. vol. VIII.

tolerable accuracy. I have in consequence greatly restricted the plan. The matter which is here to follow, relates to two heads; 1st, Some particulars of the husbandry of these countries in general; 2nd, A review of the districts; in which an attempt will be made to estimate, or enable the reader himself to estimate, their present degree of cultivation, the supplies they yield, their population, and the distinction of their industry; this is, as it were, the summing up of all. It is much to be regretted, that it is the most difficult, as well as the most important of the subjects attempted, and that in which the conclusions drawn, will the oftenest be found vague, unsatisfactory, and erroneous; nor could it be otherwise, if we advert to the natural difficulties of the subject, when it is necessary to proceed on report merely. The witnesses, though numerous for the elucidating other subjects, were few for the elucidating of this, which requires many concurring testimonies, and much minuteness of testimony. The local and national vanity of informants, not to mention individual prejudices and hasty judgments, forbid our relying on their opinions as judicious and impartial; could they be relied on, still there is much difficulty in ascertaining the exact force of those comparative terms, which in all cases must be used, for they assume a different meaning according to the standard to which the mind of the speaker has been accustomed.

Section I.—*Of Husbandry.*

166. Lands in these countries are divided into irrigated and not irrigated, or in the local Persian *abee* and *lulm*; this last term I have for brevity's sake retained. Lulm is itself of various kinds; that which most strictly deserves the name is commonest in Chuch and the plain of the Mundurs, where the quality of the soil is excellent; the fields are merely ploughed in the ordinary way, and not divided into partitions, nor is any other contrivance used either for the retaining the rain which may fall on the surface, or for receiving any supplies from other quarters. But in general, lulm lands have some advantage in this particular, natural or artificial. In hilly countries the hollows which re-

cessarily receive part of the rain falling on the neighbouring heights are cultivated in preference; others are so situated that it is easy to turn on them the water of nullahs, and these are not reckoned irrigated, but lulm, (see paragraph 78). In Toorkistan, certain lands are distinguished into a class as receiving in the spring a great deal of thaw water. There are other lands, which depend entirely on the rain which may fall on their own surface, but have been provided with a high bank of earth which surrounds them and retains the water; such may be seen at Oormul, a village about 9 miles south-east of Peshawur; they are every year under crop from one generation to another. There is still another species of lulm quite distinct in its nature from all the preceding, being land moist in itself, without requiring for the success of the crops raised on it rain or any other supply; such is in Cabul called *za*, and in that, and similar climates, is commonly in the state of natural meadow. In Hindoostan are considerable tracts of it, being the low banks of rivers subject to be under water for a great part of the rainy season, and large spaces lying under the great northern mountains. In Mooltan, where it is considered as the most valuable species of land, it is called *sew* or *seo*, that is literally border, because it lies near the rivers.

167. Irrigated lands too, may be divided into species whose differences it is important to note. Some lands are only imperfectly irrigated. The Kamojoe Kafirs turn the water of springs upon their fields, but the supply is so defective, that summer showers are anxiously looked for. In most cases, rain in the accustomed season is welcome to the owner of even well irrigated lands, as saving him the trouble and expense of watering. Irrigated lands may be divided into those which depend on springs and natural streams; secondly, those which depend on wells; thirdly, those which depend on *kahrezas*; fourthly, those depending on dams. The first kind contains several species. In the vallies of mountainous countries, and in plains under mountains, it is easy to conduct the water of streams from a higher level upon the fields, and this constitutes the first species; but in open and champaign countries the difference of level is seldom so considerable as

to admit of this, it is therefore necessary in watering from the rivers or the canals which are drawn from them, to raise the water by machinery. I have heard that on the bank of the little river Turee, which runs near Jumboo, and afterwards falls into the Chunab, there is a machine for raising water out of it, which is turned by the current of the river itself. But I believe no other instance is known, where instead of the force of the water a living force is not employed; this species therefore approaches to the second kind, or that of wells. In Mooltan and Sindh, the most common mode of watering is by what are called *jhulars*, which are half wells cut out of the edge of the channel within which the canal runs. Jhulars are used by the Daoodzyes and Mihmudzyes, and are not unknown on the banks of the Oxus, in the dominions of Bokhara; but in the whole of Toorkistan, the only mode of irrigation worth attention is the first species, or that in which streams are turned upon the fields.

168. Wells may be divided into three kinds; the 1st is the cutch well, which in Hindoostan they call *Dhenkulee*, or rather that name is applied to the pole, which in this species is used. 2d, The Persian wheel, called in Persian, *Churkh-Chah*; and in Hindoostan, *Ruhut* or *Hurt*. 3rd The bucket well. The first species is proper only when the depth to the water is very small. In the Punjab it is sometimes used in irrigation. In Cabul and Kushmeer it is employed only in wells whose water is drawn for domestic purposes. The Persian wheel is proper for moderate depths; it brings up the water by means of pots, in a manner already described by travellers in Egypt, in which country it is very common. I believe it to be found in Mesopotamia, and in certain quarters of Persia, but in large spaces of that kingdom it is utterly unknown, neither is it known in Khoorasan, and it is barely known in Bactria and the west of Toorkistan. It is this wheel which is worked in the *jhulars* of that country. There was once a Persian wheel in Cabul, but now there is none west of Jellalabad. In Peshawur, Chuch, and Sindh, it is the chief kind used; it even extends into Seeweestan, but in that country streams are partly used in irrigation, and for drinking they have another kind of well, to be

mentioned. Towards the quarter of India, we may trace the wheel through parts of Chuch, Jodhpoor, Oodpoor, and Goojrat as far as Bombay; in the north it extends to Loodhiana, in the upper part of our Dooab, but it is lost as the traveller proceeds thence towards Delhi. There is only one east of the Ganges. There is no doubt that it might be adopted with great advantage in all our provinces, especially where the water is at a medium depth below the surface; but where it is beyond fifty feet, the weight of the pots is so great that the use of it will be no longer economical; and instead, ought to be substituted the bucket well, which is the third species enumerated. It has some varieties, which need not here be adverted to, as only one is well known in these countries. The bucket is of leather, and is raised by a single rope which passes over a pulley, and is drawn by cattle; this is the commonest well in Toorkistan and Khoorasan, where however it is not used in irrigation but only for the supply of water for men and cattle. The pasturing tribes in the west of Toorkistan and north-west of Khoorasan carry buckets with them, with which they draw water. In India this species of wells is on the whole the commonest; in the desert and the arid tracts lying east of it, the water is at too great a depth in the soil to admit of any other.

169. The third species of irrigation is still more expensive and operose. It is that by kahrezas, or aqueducts, by which the water of a hill or rising ground is brought out at its foot in a rivulet, to be disposed of at the pleasure of the farmer. A kahrez is usually made in the following manner:—A well is dug at the spot where it is intended the water shall issue; above it, in the acclivity, is dug another at the distance of from five to twenty yards, according to circumstances and the custom of the place. It is said great skill is required to judge what hills will yield a copious rivulet and in what line it is most advisable to conduct the kahrez. The wells are continued at distances generally equal, until the owner thinks the quantity of water will be sufficient, or until the depth of the wells (which however does not increase at the same rate as the height of their summits in the acclivity) becomes so great that the expense ex-

ceeds the advantage. In Ghaeen, Toorshish, and some other parts of Khoorasan, the highest wells are sometimes 70 yards deep, but in countries better supplied with water, they are much shallower. All the wells are connected below by means of an aqueduct through which water flows to the foot of the hill. Kahrezas are known in almost all parts of Persia and Khoorasan, in the west and middle of Bulochistan, in the country of the Tureens and Bulochees, in the table land of Ghuznee, and even Cabul, but they are not to be found east of that district. There is at present not one in repair in the whole of Toorkistan, but in the last generation a considerable number were dug by Koobad Khan Undijanee, lord of Koonduz, with a view to the cultivation of hilly wastes called the Dushti Jubulda, but they are now gone to ruin. Very good kahrezas will turn a small mill of the country. The most famous is that in the neighbourhood of Ghuznee, ascribed to Sultan Mahmood. Including its branches it is asserted to be 12 koss, but this is probably an exaggeration. Many kahrezas are two miles long, and in some quarters a great one will cost 20,000 rupees. Such works do great honour to those nations, and are one proof out of many of their industrious dispositions.

170. Wells are proper in level champaign countries and plains, in which water is found throughout at a moderate depth; natural rills are chiefly useful within hills of considerable height, or at their foot. Kahrezas are natural to a country when the hills are low and unconnected, and consequently send out no constant streams; but when there are found vallies among such hills, which in the seasons of rain receive the water of the neighbourhood, but are dry during the remainder of the year, it may become advisable to retain that water (to be used when in future most advantageous) by extending a dam across the valley in a convenient situation; these are the dams most common, and which peculiarly deserve that name. The water of a feeble stream is sometimes dammed up for future use; and dams are often required in drawing a canal from a river, or diverting the channel of a constant stream; but such fall under the first species of irrigation. Rain water dams are common in the Soolemanee hills, and in some quarters of Seeweestan. There

are ruins of very magnificent dams within the Paraparnisan mountains. Somewhat similar to dams, are tanks, very much used in irrigation in some quarters of India, but very little in any of those countries, and in most of them not at all. The method of scooping water is probably unknown beyond the provinces which border on India.

171. India has two harvests in the year, the products of which are for the most part distinct, but not always. The *rubbee*, sown in autumn and the beginning of winter, is cut in the spring, and consists chiefly of wheat, barley, chunna, musoor, peas, and beans, most of which are raised in cold climates also. The *khureef*, sown during the rains, or immediately before them, is reaped in the autumn, which is the harvest time of the higher latitudes; but the khureef products are seldom capable of being cultivated to advantage in them, being rice, maize, jooaree, bajra, moth, moong, oord, murhwa or baggy, and some others. These two harvests thus distinguished, extend as far as Jellalabad and Lughman, and generally to the cold climates; but these last, and also the warmer ones beyond them, are commonly said to have the rubbee only; this is strictly true of the very coldest,—such as the Tibets, the greater part of the Huzara country, the upper parts of Budukhshan, and some others; but with respect to the more temperate, some circumstances may be stated in modification of it. It is of little importance what phraseology we adopt, provided the facts be kept in mind.

172. Even in Cabul many products of the khureef are actually raised, and probably all might be raised. In the whole of the west of Toorkistan beyond the Oxus, and of Bactria, jooaree is one of the greatest crops in the country, and does not fall short of the Indian either in quantity or quality of produce. We may trace it into the country of the Kuzzaks and Kirghizes. Maize grows in all but the coldest countries, as well as in India, except that there it is sooner ripe. It has been but lately introduced into Cabul, Candahar, and most other of the neighbouring countries. In those quarters it is raised not to be ground into flour, but be eaten whole after being roasted. Mash, which includes oord and moong, is a common produce in Toorkis-

tan, parts of Khoorasan and Afghanistan. Rice is the chief corn of Kushmeer, and is raised in all but the coldest countries, provided there be a sufficient supply of water; it seems however to degenerate in quality in such countries. In the warmer parts of Khoorasan, were there but summer rains as in India, the khureef might be expected to be equivalent to the rubbee. Not only can we trace some of the products of the khureef into the moderately cold climates, but we may mark two harvests tolerably distinct in their seed times and their products. This may be exemplified by a sketch of husbandry of the valley of Cabul. The great seed time is the autumn, in which are reaped wheat, barley, musoor, and peas; these are reaped chiefly in the month of June, having lain under the snow during winter and been protected by it. All of them are sometimes sown in the spring, and this practice is far commoner in Budukhshan and many other quarters, but the spring-sown are cut nearly at the same time with the autumn-sown. To this harvest belongs chunna, which is very rarely sown in the autumn, but beans are sown about the end of May and reaped in the end of September; the autumn-sown products, together with chunna, may be said to form the rubbee of Cabul, which is by far its greatest crop. There remains however some considerable products which have different harvests. Besides beans, which in India belong to the rubbee, we may mention the two grains there called *cheena* and *kungunee*, in Persian *urzun* and *gal*. In India they are scarcely considered as belonging to any season, for by the help of water they may be raised equally well in all. The cheena however is more commonly cultivated in the rubbee, or rather after it, and the kungunee in the khureef. In Cabul they are raised sometimes for fodder and sometimes for their grain. In the latter case they are sown in the beginning of May and reaped in August. Maize and mash are sown a few days later, and reaped in September. Rice, a far more important product than maize, is sown in May and June, and reaped the end of August and September.

173. It is even practicable in this valley, by good management, to gather two crops within the year off the same ground. In India the farmer usually contents himself with one crop in

the year, and the rubbee and khureef lands are distinct. In Cabul there is a similar distinction between spring lands and autumn (buharee and teeramahee). A good farmer ploughs his spring lands in autumn, and gives them a red winter fallow; and his autumn lands in spring, giving them a red summer fallow; but where plenty of manure is to be had, he both gives more to his fields and exacts more from them. After cutting his wheat, barley, and other rubbee products, but especially after barley, he ploughs and sows other things which come to their perfection in the autumn. Kungunee and cheena intended to ripen, can scarcely, in Cabul, be raised after wheat, but may be raised after barley, which is about twenty days sooner. In Bulkh considerable quantities of these grains are raised after barley, and sometimes after wheat, for the harvest there is earlier. In Cabul they may be cultivated for fodder even after wheat. The kungunee, when its ear is forming, is eaten down by sheep or other animals; the cheena is reaped in the same state and given to stack. In Bulkh they sometimes raise maize, mash, melons, and garden vegetables and greens, after wheat and barley; but chiefly in Cabul, certain only of these can be raised to advantage in this manner, for the land is there scarcer than in Bulkh, and the farmer studies to draw the utmost from it; the lateness of the harvest and coldness of the autumn often defeat his intention.

174. The grains and garden vegetables just mentioned are, in general, the same which are cultivated in England—carrots, turnips, radishes, cabbages, lettuce, cauliflower, onions, garlic, &c.; to these are added some from India. The mothee of India gives but little produce in Cabul. The shukurkund, or sweet potatoe, is not known even in Peshawur. Most garden vegetables are cultivated in spring ground, some in ground lately under rubbee. Melons are commonly raised in spring land. In Bulkh it is customary after cutting barley, to plough, manure, and sow a mixture of mash, musk melons, and water melons, which all ripen in the autumn. In Candahar there is no difficulty in raising the paliz (for that is the name given to a crop of melons or cucumbers) after the rubbee. Great quantities of manure and water must be given to the paliz. In certain places in the

east of Bactria, however, it is lulm raised. Next to their fruits, the natives dwell on the excellence of their paliz, and it forms no inconsiderable object of attention to the farmer; it is most abundant in the neighbourhood of cities; in very remote and rustic parts it is unknown, but they are few. Few things that are cultivated, derive their qualities so much from the soil as from some unknown circumstances. Futehabad, on the road between Jellalabad and Cabul, is famous for the excellence of its water melons; near this place Shujaool Moolk was defeated in June 1809. All the products which have been mentioned, including paliz, are, in Khoorasan, included under the name *subzbur*, except wheat and barley, which are called *sufedbur*. In Toorkistan, the terms *kupood*, *burgee*, and *sufedburger* are substituted. The distinction is recognized in the revenue system, and the rules of collection from each are sometimes different.

175. The boast of the natives is their fruits. Those of Cabul are acknowledged to be good, even by the Persians, whose country is celebrated for its fruit, and who are generally loth to commend any other. The Cabulees probably lavish too high praises on their fruits. Their pears at least are but ordinary; their apples are inferior to those of Kushmeer, and even they, when brought to India, are not so good as the English or American. It is but just to observe, that the most delicate and luscious varieties of the fruits are not capable of being preserved for exportation, and a foreigner cannot judge of their merits, without visiting the place. The following are the chief fruits of Cabul—the apple, pear, plumb, cherry, peach, apricot, quince, mulberry, pomegranate, almond, walnut, and grape. The fruit called Allo Bokhara, is not here raised; it is quite unknown at Bokhara. The greatest quantities are raised in the district of Ghuznee, whence it is exported, but some are produced in particular places of Khoorasan. The mulberry has been already mentioned, and appears to be a most important object of culture in certain parts of the country; the walnut is cultivated in the neighbourhood of Cabul, but on the whole, it ranks rather as an uncultivated, than a cultivated product. In the valley the season of fruit begins about the time that the

barley is reaping. The earliest species are certain kinds of mulberry, the plumb, and a kind of apple called Jaurisigurma. The latest fruit are certain kinds of apple, which ripen in the end of September and beginning of October. The apricot is very abundant in Ghorbund. The grapes of Cabul are much celebrated, and comprehend many varieties and degrees of estimation; the earliest are ripe in the last days of August. The fruit gardens of Cabul on the whole, occupy a considerable part of the valley, and furnish one of the greatest exports of the country. In Khoorasan the fruit is good, but it does not form a prominent object of culture. The pomegranates of Candahar are large and good; some are exported. The natives of Toorkistan boast of the goodness of their fruits, and probably with justice, but little reaches India. The quince of Peshawur is said to excel all others. The place produces no other fruit of remarkable goodness.

176. Hay is known in most of these countries, but not in all places of them. We have already seen that most of the pastoral nations trust the subsistence of their stock during the winter to the withered grass still remaining in the pasturing grounds, even though it have been buried to a considerable depth under snow. I have already mentioned the custom of the Hazard Ymaks, and others, of reaping the natural grass of their pastures, to serve as fodder during the winter. With respect to the provinces towards India, and formerly part of it, their customs, in this respect, are the same as those of that country. No natural grass is reaped for hay; the only exception I am acquainted with in the whole of those wide countries, is the custom in the countries east of the great Indian desert of cutting grass at the end of the rains. A provision of grass is reckoned necessary to enable a town to stand a siege. The cultivation of artificial grasses is (I believe) quite unknown in India, but it is very common to sow certain of the khureef products, such as jooaree and moth, with a view to cut them before ripening for the stock. When so intended, they are always sown thicker than usual, and called *churee*; part is given green, but more is reserved to be dry food during the cold season. The same custom prevails in Cabul

with respect to cheena and kungunee, as already mentioned, (see paragraph 172); but what corresponds to our clover and hay is the rishka and shufteer. These plants are found in a wild state in many parts of these countries, as has already been mentioned (see paragraph 124). The shufteer is an annual, or at least is cultivated for only one year from the same seed; it is generally sown in the autumn. The first reaping is, in Cabul, about the 30th of April, and it may be cut again twice or thrice during the course of the summer and autumn. It is little cultivated in Khoorasan. In the district of Hirat, it is sometimes ploughed in, without having been once cut, to serve as a preparation for rice. It is scarcely cultivated in Toorkistan, where it is very commonly wild. Rishka seems to be a much superior plant. It is represented as a perennial, and is in fact allowed to remain on the ground ten years, sometimes fifteen. It is cultivated in Cabul and all the countries west of it, but both rishka and shufteer are unknown in Peshawur; they require much watering. Rishka is generally sown in the spring.

177. A custom little known in India is, that of cutting what are called khuseels. By this is meant the cutting out the leaves of wheat or barley, before the stalk has risen, to be given to horses or cattle. In Peshawur it is thought that barley may be thus cut twice, or even thrice, with little or no injury to it; but wheat is more delicate in this respect, and many condemn the cutting even one khuseel of it. In Cabul no khuseels are cut, and perhaps the custom is pernicious in that climate. It is very common to eat down by cattle, the young leaves of the wheat and barley in the autumn or beginning of winter. In the Kuchhee of Mohummud Khan, both customs prevail, and the cutting of khuseel is common in most parts of the Sikh country. When a crop is likely, in the Punjab or Peshawur, to turn out an indifferent one, or when danger is apprehended from military violence, the farmer sometimes thinks it advisable to cut it down, even when the ear is formed, as a khuseel, and instead of it to sow some other product. Khuseels, in the sense first explained, are cut in all provinces of Persia; they are thought to be a good food for animals.

178. The rubbee of India and of the warm provinces of the

Afghan monarchy as far as the hills to the west, is almost invariably autumn-sown. In our upper provinces, the month of October is the best month for sowing, and that in which most is sown. Moderate rain before sowing, or in lieu of it, one watering, is favourable to the future crops, but not reckoned indispensable. In the neighbourhood of Peshawur, the owners of lands capable of irrigation never fail to give one water before sowing wheat or barley. This is called in the local dialect *tleap*, and is not considered as included in the number of waters commonly said to be given to these crops. Beyond Jellalabad there is not the same uniformity of practice with respect to seed time as formerly observed; all the products of the rubbee are, in Cabul, occasionally sown in the spring, and cheena is always so treated. In Ghobund the whole of the barley is spring. In the district of Ghuznee there is on the whole more spring corn than winter. In Budukshan the barley is generally spring, as well as a part of the wheat. In the whole of Toorkistan and the greater part of Khoorasan, the whole of the cheena is spring. In Candahar it is true most of it is winter, and spring corn is but little known in that district; but in the country of the Hazaras, except the most temperate parts, all the crops are spring; the same is true of the most lofty parts of Budukhsan, Durwaz, Keerategin and Wukheeha, the Pamer, a considerable part at least of Kashkar, and all the Tibets. From the last, the custom has spread to Kushmeer, but the rubbee there is inconsiderable. It will be found in most cases true, that the greater the cold of the place, the less of winter crops; another rule usually holds, that where the lands are irrigated, there is more winter corn, and vice versa. The chief reason assigned is, that lulm crops sown in the autumn are subject to be hurt by the frost; but the owner of irrigated lands can protect his young crops from its rigour, by watering them. This water is therefore called *yukhab*, in Persian. In Keerategin alone, the rule is reversed under peculiar circumstances.

179. In our upper provinces, the harvest of wheat and barley is in March and April. It is observed that the south-east is earlier than the north-west; but the difference is not considerable. The rule however holds good in our further progress to

Peshawur, and between the harvest of that place and of Delhi there is at least one month. On the 20th May, there was wheat still uncut in the valley of Peshawur; Bajour, Koonur, Jellalabad and Lughman are somewhat later. It is a common saying in the country, that the rubbee comes from the east (that is, begins soonest in that quarter) and the khureef from the west. The latter fact it is not difficult to explain, for the khureef here meant, is the Huramee khureef (so called in the country) which is sown in the end of May, or earlier, and is artificially watered. The causes of the former fact deserve our attention. They seem to be the following. 1st, As we proceed north-west, the heat of climate declines, and crops ripen a little more tardily. 2nd, To the west the periodical summer rains become later and later, and hence the seed time, and as depending upon it the harvest of the khureef, is retarded, which has a natural tendency to retard the seed time and harvest of the rubbee. 3rd, A great proportion of the rubbee is sown on low lands (see paragaph 166). The consequence is, that the seed time must be deferred until these lands become capable of tillage, by losing a portion of the moisture they have gained during the flood of the rivers and the periodical rains. In the second place, crops sown on such lands are later in ripening than the crops of higher lands.

180. All parts of the valley of Cabul are not of the same temperature, and in the ripening of crops on soil and exposure, June on the whole is the harvest month. Ghuznee is some days later than Cabul, and the Hazara country considerably later than Ghuznee. In Seatsung of the Hazaras the harvest is in October, and snow sometimes falls before it is gathered. Candahar is a little later than Peshawur. Bokhara seems equal with Cabul, and the harvest of other places may be calculated with tolerable exactness, from the temperature. The Pamer however is very early. The Kirghizes during their visits to it in the summer, cultivate some wheat, barley, and cheena. There wheat though later sown than the little spring wheat sown in the dominions of Bokhara, is sooner ready. We may here notice a curious circumstance with respect to the corn of the highest countries. The wheat of Tibet, the Pamer, and the Hazaras, is

bearded like that of India, but the barley (especially of Tibet) is unbearded. Not less singular is that species of barley well known in Persia, in Mushhud, Goonabad and some other parts of Persian Khoorasan, under the name of jouitoorshee. That part which is intended for seed is given to horses, with such precautions as prevent its being triturated, and thus losing its vegetative power in the body of the animal; when afterwards sown in the spring it comes to perfection in sixty days.

181. The scythe is unknown, and crops are reaped by the sickle. Wheat and barley are, in Toorkistan and most other quarters, separated from their straw on the field. In Cabul the straw is reckoned equal in value to the grain, and to prevent its dissipation, most farmers carry the crop after reaping and drying to the farmstead and there separate them. In these countries, as in India, the rubbee crops are trod out by animals, not thrashed; to these there are few exceptions. In Kushmeer the labour of men is cheap, and there all crops are separated from their straw by being beaten with sticks. I recollect to have heard of the flail being somewhere used. The methods of preserving corn are various. In Toorkistan the most common practice is to lodge it in *juts*, which locally they call wells, but in Tashkund Week-kheeha, and Keerategin, *kundoos* are commoner. These are well known in Hindustan, and are made above ground of mud and straw. In such are lodged a great part of the grain of Cabul, Ghuznee, and Khoorasan, but in cities, granaries belonging to individuals are upon a much greater scale. Many of the Dooranees have considerable stores of former years lodged in their houses. This resource secures that country from even the chance of a famine; and famines are rare in any part of the countries in question; the most common cause is the devastations of locusts.

Section II.—*A Review of the Districts.*

182. In the following review of the districts, I shall altogether omit some considerable spaces of country which have been mentioned under preceding subjects. The late embassy in Sindh must have procured information respecting the Tal-

pooree dominions, much preferable to any I can offer. During our inquiries we have always experienced great difficulties in gaining just and consistent accounts of Bulochistan, and I have learnt that government have lately received some information respecting that country; on both accounts I intend passing most of it in silence. To the south we begin with Keharapoor, and the line between it and the neighbourhood of Candahar. In my opinion there is no other line with which it so much behoves us to be well acquainted, and I therefore feel the greater regret, that the information yet obtained regarding it is so unsatisfactory. The country immediately north of it, constituting the southern part of Afghanistan, is still more obscure, and there are certain places, the routes between which we have never been able to obtain. In the account of Candahar, something will be said of the Doorranee country and Seestan. With respect to Persian Khoorasan, it will also be mentioned, though very briefly. We have to regret that our information is often the most scanty concerning those countries whose position and other circumstances render them most interesting in a public view. To the north I shall omit the Punjab as far as the river Hydaspes, as being little different from many provinces of India, and because of information already obtained of it.

Four Tuppas of Cabul.

183. The rubbee is the greatest crop, and according to our way of speaking, the only one (see paragraphs 171—3.) Wheat is the chief product, and after it barley. The poorest classes consume a considerable proportion of barley and peas in their food. There are none so poor, but that they occasionally indulge in animal food, and the rich in a great measure subsist on it. Corn is imported even from the environs of Ghuznee. Rice is brought from upper Bungush, Jellalabad, Lughman, and even Koomer; in a dear year, corn is sometimes brought from Bamean in small quantities; on the whole however the quantity of corn annually imported into the valley does not bear a great proportion to that produced in it, and provisions are seldom dear. The chief supply of ghee is from Bamean, the Hazara country, and the Ghigies, who pasture their flocks

in the southern parts of the valley and its skirts; some is brought from the extremities of the Hazara country. From Toorkistan are brought sheep, but seldom either ghee or lambs. From the Hazara country come considerable numbers of sheep. In the spring, lambs are had from the Ghiljies. Horses and ponies are imported from Toorkistan, but some are fed up in the valley. The people drink from streams, but those of the city in part use wells. Fuel is brought to the city chiefly from the south; the chief supply of timber is from the mountain Kulkucha, three days to the east of Cabul. In the valley itself there is a good deal of cultivated wood, being that of fruit trees, willows, and sycamores. In Kohistan there is abundance of natural timber, but it is not required. The orchards of this valley, which are very numerous, are chiefly in the Kohdamun, and in it the valley of Irtalif is much celebrated for the excellence and profusion of its fruits, and also for its picturesque beauties; still the most interesting object to the people is tillage. The chief pasturage is in Logur and the south, as also towards Ghorbund. The Tuppa of Bootkehak is that in which agriculture is most pursued. In the whole valley the watered lands much exceed the unwatered, but in the southern skirts there are some small spaces in which the reverse is true. Fodder is scarce and dear in Cabul, and most parts of the valley; artificial grasses constitute a considerable part of it in those quarters where pasturage is much pursued. A part of the population live under tents, in summer but otherwise houses are used, and the most common kind is the flat, roofed. In Cabul, which is a close built town, house rent and ground rent are very dear. The chief live stock is in cows, except where pasturage is followed, and there sheep are a more important object. A considerable trade is carried on by the Cabulese, especially with Toorkistan and Hindoostan; the late distractions have thrown obstacles in the way of trade, but otherwise little affected the prosperity of this city and district. The population of the city may be guessed at 60,000 souls; the villages are various sized, and on an average may contain 150 families; they are not fortified, but invariably contain small castles or private forts, of very contemptible strength. There are few wastes or spaces ill supplied with

water in this district; such as do exist are towards the southern and north-western limits. With respect to carriage, bullocks are chiefly used within the valley; those who trade to Koorasan employ a majority of camels; goods taken into the Hazara country are carried on mules and ponies; the Ghiljies who trade to Toorkistan by the road of Bameean use camels. In the trade to the eastward, including all quarters, equal use is probably made of camels on the one hand, and mules and ponies on the other.

Ghorbund.

184. This is but a small district, and on the borders are large tracts which are merely pastured; but except the waste called Regrawan (see paragraph 99) there is no considerable space where the water of springs or streams is not to be had. A great part of the district is hilly, and though the hills be often of a tame character, some of them yield pine. The houses of the district are flat-roofed. In the summer a part of the population live under black tents. The pasturage is very important, but still the chief subsistence of the people is from agriculture. There are very numerous orchards, and the chief fruits are apricots, almonds, and grapes. Raisins are brought from Ghorbund to Hindoostan. The chief cultivation is along the stream of Ghorbund, and of course the proportion of lulm is very inconsiderable. The chief product is wheat, and after it rice, notwithstanding the coldness of the climate; after rice is barley, which is chiefly spring sown; there is little palez or maize, nor are pease much raised. Wheat, sheep, the ghee of milk, and that of doomba fat, are exported to Cabul, and of course provisions are cheap. The people, who are not very numerous, live much at their ease, and the climate is healthy. The Kheshkees, a small tribe of Afghans who reside here, carry on some trade between Cabul and Toorkistan. Grass in the summer is very abundant. Some rishka is also cultivated for the wants of winter. The chief live stock is sheep, but their cows are in a considerable proportion. The pasturing people breed some horses, chiefly of a small size. Within the district the chief carriage is probably on ponies. For fuel they burn shrubs and

sometimes the branches of trees, and they drink the water of streams and springs. The chief village of the district, which is called Ufzul Khan, may have 200 houses, all the others are much smaller.

Kohistan of Cabul.

185. The term Kohistan, when used by the Cabulese especially, is seldomer applicable to a hilly country in general than to that mountainous space which lies north of the valley of Cabul; every valley in it has its stream, and there are many springs among the mountains; timber too is plentiful, and in the summer, grass. The inhabitants chiefly subsist on mulberries, and after them perhaps their grain and their live stock are of equal importance. I know not that any of the tame animals can be said to be the favourite stock. Of grain, wheat is most cultivated, and after it kungunee and barley. Some grain is imported, especially from the Kohdamun, and the returns are made in cheese, which is here very good, and cotton, a product we would not have expected in a country so cold. On the whole, however, there is but little trade internal or external, and the people live much to themselves. The country is strong, and at times refuses revenue. The people live in flat-roofed houses, and those who attend the live stock to the mountains in summer do not use tents. The villages are small but numerous; and though the surface under the plough be little, the population is not inconsiderable. Wheat and barley, with very few exceptions, are autumn-sown and watered.

Jellalabad.

186. This district is very diversified, and many of the following observations are not true when applied to certain parts of it. It may be said to begin in the eastern quarters, near Umburkhara, in the vicinity of the Markoh or Bedoulut, to extend west to Nimla Kuja, a town of the Khogeeanus, a tribe of Afghans, is within the revenue division, and being situated nearly on the crown of the range of 34°, which is here moderately high, is a cold place. The other towns and villages, with but few exceptions, are in a warm climate, and there are

two crops in the year, as there are in Kuja also. The chief subsistence of the people is from tillage, but they have considerable herds of cows and buffaloes.

It may be observed, however, that in these countries the keeping of both these animals depends, or is supposed to depend, on agriculture. In the winter great flocks of sheep pasture in certain parts, but they do not belong to the inhabitants of this country, but to the Ghiljies to the west. The khureef is the greater crop, and in it, rice; but the quantity of maize is also considerable. The wheat, barley, and maize are nearly equal. A part of the wheat and barley are raised lulm, and some is spring sown; all the khureef is irrigated expect it be some jooaree, which is raised for green food; that plant is not cultivated for its grain in any of the districts north of the range of 34°, and bajra is not to be seen. In Jellalabad the quantity of chuna is very small. For watering their lands they use living streams, and in certain parts rills from springs. There are no kahrezas, or dams, but in some quarters khwurs are turned to account. Wheat is imported from Bajour into the town of Jellalabad, which may contain 10 or 12,000 inhabitants. To Cabul is exported sugar and cotton, some apricots and pomegranates; the pomegranates of Kuja are much esteemed. Cabul returns chiefly dried fruits. Jellalabad lying on the road from the east to the west, certain of the inhabitants of its villages subsist by the hire of mules and other animals; and the supplying of provisions to travellers of all descriptions is an important object. Fodder is in general but moderately plentiful. For fuel they burn dung, shrubs, and those along the river, drift wood. The chief supply of timber is from the white mountain, and others connected with it. The houses are flat-roofed. In the villages they drink from streams or springs. In the town there are also some draw wells. There is little fruit compared with the countries to the west; and if we subtract the transit trade, the district carries on but little traffic. The inhabitants are few who use tents in any season of the year. Their villages are small, and there are considerable tracts, both hill and plain, without cultivation, and some of these without water. Bullocks are the chief carriage within

the district, and in its intercourse with others, perhaps mules are most used.

Gundumuk—Ishpan—Khingul—Tugao, &c.

187. By means of these names it is intended to designate that space of country which lies between Cabul and Kohistan to the west, and Jellalabad and Lughman to the east, being itself bounded to the north and south by two great ranges of mountains or their branches. It is very diversified, and its importance is not sufficient to justify the lengthened details requisite for fully explaining the nature of its various parts. A very great part of it, or its borders, is uncultivated pasture, chiefly hilly; there are few considerable spaces destitute of water. The villages are generally small, but there are some large ones. The population of a given surface is greatest in Tugao; Khingul and Tugao belong to the Safees, a tribe of Afghans formerly more numerous than now, and lie to the north. South of them, in the present tract, are Ghiljies and some Khogeeanus. With the exception of Tugao, the khureef is the greater crop in this tract, and of it, rice and mash; and quantities of these are exported to Cabul. The rubbee harvest being here earlier than in Cabul, a portion of the crop is sold in that city to great advantage immediately before the harvest commences in the valley. With respect to the fixed inhabitants, agriculture is more important to them than pasturage, and cows are their chief live stock; but as the wandering Ghiljies from the west pasture their flocks here during a part of the year, it is a matter of doubt whether the district is to be called an agricultural or pastoral one. The numerous flocks of the Ghiljies consuming the grass, fodder bears a considerable price, especially in the cold part of the year; but in Tugao it is cheap. The natives live in houses which are flat-roofed, and timber is easily procurable in most situations, as is fuel from shrubs or branches of trees; and they drink from the numerous springs and streams. Provisions are cheap, but it is to be remembered that the population is small. Some sheep are bought from the Ghiljies. Besides provisions some pomegranates and other fruits are sent to Cabul before they come in

season there, and this district is distinguished by making a little silk. The crops are irrigated with few exceptions, and the quantity of rubbee, which is spring-sown, is but little. Within the district bullocks are the chief carriage. The climate is different in various places, but on an average is a temperate one.

Lughman.

188. Nature has divided Lughman into two districts,—the hilly, inhabited by Ghiljies, and the plain, inhabited by Lughmanees, a race of Indian descent. In both however there is abundance of water, timber, and fuel. The houses are flat-roofed, and the people drink from streams, or in the hilly tract from springs. Among the hills, black tents are used by some of the shepherds in summer. The temperature is much milder than in the Kohistan of Cabul; the country does not appear to be strong. The term Kohistan without the addition of any other to explain it, is not applicable to the hilly part of Lughman. Both there and in the plain the khureef is the chief crop, and rice the chief product. Among the hills maize is the next important to rice, but very little is raised in the plain, where, in its stead are raised sugar and cotton. In either quarter the quantity of wheat is but little, and barley is scarcely raised at all, rice straw being the chief food of the horses. Their horses are not numerous, and they have no camels. Within the district the chief carriage is by bullocks; among the hills the chief stock is perhaps goats, and after them cows, but in the plains the chief stock is buffaloes. Almost all the lands are watered, and chiefly from streams; the climate of the plains is accordingly moist, and agues common. The little rubbee raised is almost invariably autumn-sown. The cultivation and population are considerable. To the west however is an extensive waste, being a plain with small hills, and yielding little water; it is called the plain or desert of Shytan-goom. There are some large villages which may have 800 houses, but in general they are small. There is little fruit, and the chief trade is in rude produce. Wheat is imported from Bajour; ghee and sheep are brought

from the Ghiljies during their annual visits to the low country, when some of them pasture on the skirts of this country, and others pass through it. Sugar, cotton, and rice are exported to Cabul.

Koonur.

189. Koonur is an agricultural country, though there are certain dependencies of it to the north-west which are perhaps pastural, but they are of little account. The chief crop is the khureef, and the chief produce rice, part of which they export to Cabul, the country of the Upper Mihmunds, which lies east and south, and some other quarters. The population is considerable along the banks of the river. The capital, which is called Pushut, is equal to Jellalabad, and there are some large villages; but generally speaking the villages are not so large as in the plain of Peshawur. Into Pushut they import some wheat from Bajour. Ghee is brought from Deogul, and other hilly dependencies to the west of the river; sheep and goats from Bajour; but provisions in general are sufficiently cheap. In the valley cows are the chief stock, and after them buffaloes; the chief carriage is by asses. Fuel, fodder, and water are plentiful, and timber is procured in abundance from the west side of the river. There is also some pine in that part of the Upper Mihmund country which borders on Koonur, and in which the Syyaed of Koonur has influence. The people live in flat-roofed houses, and never use tents. Their fields are almost all irrigated, and their wheat and their barley, which are not great crops, are autumn-sown. The wood of the olive is much burned.

Bajour.

190. This also is an agricultural country, and cows the most important live stock; yet the pasturage, and number of sheep and goats is considerable. There are no black tents used; in many cases however the shepherds pass the summer under what are called koodies, which are made of mats supported by wood. These are erected at what the Afghans call bandas, which are pasturing stations remote from the village, and at them

is sometimes a few acres of cultivated ground, but no inhabitants in winter. This however is not the only meaning of the term. The fields of this country are generally lulm, though the quantity of irrigated is still considerable; part of the lulm has the advantage of water from khwurs. Wheat is a chief product, and in ordinary years more than a maund and a half of Delhi may be had for a rupee, and the exportation is considerable. The northern part however does little more than supply itself. It does not appear that any sort of provisions is imported into the country. The quantity of sugar raised is very small, and that article is imported chiefly from Jellalabad in return for wheat. Fuel, timber, and fodder are sufficiently plentiful, especially in the hilly parts, and water is every where near, the people drinking from springs and from streams; there are few wells. A certain shrub, by the Afghans called *tirkh*, is the chief fuel. Nawangee is perhaps the largest town, Bajour itself being much declined, and the former may be equal in population to one-half of Pushut. The villages in general are small or ordinary. On some of the frontiers are considerable spaces without fixed inhabitants, and the centre of the country is not so well peopled as the plain of Peshawur. Bullocks and asses are most used in carriage, and there are not many horses in the country. The wheat, ghee, and honey are good, and iron is one of the exports from the northern parts.

Kafirs.

191. This people live in a very rugged country, with numerous streams and springs; from the latter they drink, and also water their fields, which however are of little account. They derive their subsistence from their flocks of goats, which seem to be of a species superior to others known in these countries. Their cows and sheep are perhaps in equal numbers; wheat far exceeds all the other grains they cultivate; it is sown in the spring, and watered. Fuel and timber are plentiful, and their houses are constructed of wood. Some of their villages are large, containing 3,000 inhabitants, and on an average they are of an ordinary size; they are not fortified, but are situated in places difficult of access. They do not use tents in any season of the year, but

sometimes shelter themselves in caves. Within the country there is no traffic, but they exchange their ghee, cheese, goats, and vinegar for rice, cloths of various kinds, axes, but chiefly salt. Every thing is carried by men, and there is no camel, buffalo, mule, or ass in the country. They make wines and vinegars, both much esteemed, from the grapes of their own country, which are partly wild and partly cultivated; and uncultivated walnuts are abundant. This country can neither furnish supplies, nor be crossed by troops, except with the utmost hazard.

Punjkora.

192. The people subsist by tillage; their chief crop is the rubbee, and the greatest product, wheat; after which, barley. A small quantity of grain is imported from the valley of Buroul, which is in the northern part of the country of Bajour, but has its own chief, who is a Turkulanee. In Punjkora the lulm and irrigated lands are perhaps equal. The latter depends on springs and streams. But little wheat and barley are sown in the spring. Cows are the chief stock, but according to others, buffaloes; goats too are numerous, but sheep very few. The chief carriage is by bullocks and asses. The trade between Peshawur and Yarkund for the most part passes through this country, and Kasin Khan, the chief of Deer, which is the capital of it, and may have 500 houses, levies taxes on the merchants. The other villages are generally small, and some hamlets among the mountains have but five houses, or less. The mountains yield pines, which serve for timber and fuel, and also for torches. The mountainous parts are very thinly peopled, but that part of Punjkora towards the Ootman Khel and lower Swad is very populous. Tents are not used in any season of the year. Fodder is plentiful. There are few horses in the country.

Upper Mihmunds.

193. This is a hilly country, and its hills though not high, are often very rugged. Some of them yield pines, but more commonly they are covered with shrubs. The houses are sometimes thatched. The natives in general live in houses, but some tribes have black tents, and the same use is made of

koodies as in Bajour, and to a greater extent. On the whole this is an agricultural country. In some places sheep, in others goats, are the chief stock. Asses are numerous, and are the chief carriage, next to which are bullocks. In many villages a horse, mule, buffalo, or camel is not to be found. Timber on the whole is scarce, but fuel is plentiful, and there is no want of fodder. Some corn is imported from Bajour, Koonur, and the Dooab of Peshawur. The chief return made is in mats, which the natives manufacture from the Putha shrub (see paragraph 129.) From certain parts good ghee is exported to Peshawur. The fields are generally lulm, and the chief product wheat. The two crops are nearly equal, but perhaps the rubbee is the greater. The natives drink from tanks, streams, and springs. There is much hilly waste, of no use but as pasture for goats, and in some cases water is scarce. With very few exceptions the villages are small, and the population on a given surface cannot be great.

Ootman Khel.

194. This country is more difficult than even the preceding, which however it resembles in many particulars. It has more timber, its hills producing pine, and water is more plentiful. The chief subsistence is probably from the keeping of goats, and wheat the chief product. The villages are small, but if we believe the received accounts, the population is not inconsiderable, for this tribe is never rated lower than 10,000 families. They have never paid revenue, and have little amicable intercourse with their neighbours.

Khybur.

195. This is a rugged and unproductive tract, lying between Jellalabad and Peshawur. The natives live by tillage, the keeping of goats, and robbery. Water in many places is scarce, and no pines grow on the hills, which are nearly of the same temperature as those of the Upper Mihmunds. Fuel is plentiful, and there is sufficiency of grass, fresh or withered.

Teera.

196. This is an agricultural country, though goats be very numerous. The two crops are nearly equal; and on the whole,

the production is equal to the consumption. The houses are flat-roofed, and built partly of stone and partly of mud; no tents are used at any season of the year. The inhabitants are of the Afreedee tribe. West of them are the Shinwarees, in whose flocks are a greater proportion of sheep than among the Afreedees, and some of them live at times under black tents. Teera yields considerable quantities of good honey. The villages are small. The Afreedee tribe may be conjectured to be 55,000 souls; part of them live in Khybur, and that subdivision which is called Adum Khel live towards Kohat; and the northern Khutuks inhabit the continuation of their hills. Their country answers in most particulars to the description already given of that of the Upper Mihmunds.

Peshawur.

197. The plain of Peshawur is an agricultural country, and no space of the same extent in the Cabul dominions is equally cultivated or peopled. Upon the whole the khureef is the chief crop. In the plain of the Mundars the rubbee is the chief, and the like is true of that portion of the valley which the Khutuks possess. Perhaps maize is the chief crop, and it certainly is so in the vicinity of the city. The flour of maize is generally cheaper than that of wheat, in the proportion of at least three to two, and a certain mixture of it in the latter is supposed to improve it. The maize of Peshawur is remarkably white, and much esteemed. The rice of certain villages is exported to great distances, but the consumption of this article in that part of the valley which is subject to the king, is partly supplied from Lower Swad. In the same manner great quantities of wheat and some other articles of provision are brought from the country of the Mundars. The valley generally considered, does not support its own population, for the exports are inconsiderable, compared with the imports from Bajour, Chuch, Pothwar, and Kohat, especially the two former. Contrary to what is generally true of India, the khureef is commonly watered, and the rubbee commonly lulm. The watered lands depend on streams much more than wells. Jhulars are used in part by the Daoodzyes and Mihmundzyes. A severe drought is

inconvenient even to the holders of irrigated lands, as the Bard dries up unless showers fall from time to time, and a level lower than ordinary in the rivers, subjects the farmer to extraordinary labours. In the memory of people living there have been two severe dearths occasioned by the failure of the spring rains, and the calamity was increased by the resort of people from Chuch, whose dependence is on the spring or rubbee crop, cultivated lulm. The quantity of rice and wheat does not fall greatly short of that of maize. Chuna is raised in only one village, and horses here receive barley. Several grains well known in our provinces, among which the raggee, are not here to be seen. Jooaree is cultivated only to be cut green for the use of animals. Provisions are dearer than in Cabul, but fodder and fuel are cheaper. Lodging is very cheap in the town. On the whole, an army could be more easily maintained here than in Cabul. In the city they drink from wells, but in the valley in general they drink more from streams. Some of the Mihmunds and Khutuks have tanks, and near the foot of hills the natives use springs. Although the valley produces little timber, abundance is floated down from various quarters by water, and the wood work in the city is of pine. The city may contain 70,000 inhabitants, and is considerable. Of late it has declined, which has been owing rather to tyrannical proceedings, than to the decline of the government. The few wastes in this province are chiefly in the south-eastern part. Generally speaking, it is equal in cultivation to the good parts in India. The villages are about the same size as in the valley of Cabul. For carriage various animals are used, and the chief live stock is cows and buffaloes. In some places they burn cow-dung, in others, shrubs and the branches of trees, among which the olive is one.

Swad.

198 The lower part of Swad is included in the valley of Peshawur. It is a rice-bearing, well-watered, and well-peopled country. Upper Swad is mountainous, but yet tolerably well peopled, and there too the chief product is rice. Fuel, timber, especially that of the pine, and fodder, are abundant. The

chief stock is cows and buffaloes. The khureef is the chief crop, and tillage the chief source of subsistence. Cows, buffaloes, ghee, and rice are exported in return for indigo, coarse cloths, and manufactures.

Bhooner.

199. This too is an agricultural country, but grain is imported from other quarters, and the populousness is less than in Swad. The chief grain is raised to be kunganee, and lulm is more common than irrigated land. Many of the villages are large, but there are extensive tracts among the mountains without inhabitants. The mountains produce pine in abundance, and of course timber and fuel are easily procurable, but their natural verdure is said to be inferior to that of Upper Swad. This country is seldom visited, and the natives are very rude.

Pukhlee.

200. In Pukhlee agriculture is more important than pasturage, and the khureef is the chief crop. Rice is the chief product, and after it wheat. The produce seems to be about equal to the consumption. Most of the lands are irrigated from streams. The natives generally drink from springs, and live in flat-roofed houses. Timber, fuel, and fodder, are sufficiently plentiful, and ghee is very cheap. The chief stock is cows and buffaloes. Their sheep are of the light-tailed kind. The population is considerable, and the villages are of various sizes. There are certain districts individually of small account, commonly included in the revenue divisions, of which the above observations may not always be true.

Chuch.

201. This is an agricultural country, and of remarkable fertility. The khureef crop is of very little account. The rubbee is almost all lulm, and the chief thing cultivated is wheat, of which great quantities are exported to Peshawur, besides some other provisions also supplied. The few fields that are irrigated depend on wells, but the farmers are seldom at this expense except for raising tobacco, sugar, and other products of great value. They drink from wells, and some from tanks,

or the river Indus. Timber is rather dear, and therefore part of their houses are thatched. Their chief fuel is dung. The largest villages may have 350 houses; the others are much smaller, but they are numerous, and the population is considerable. Cows are the chief stock, and bullocks the chief carriage within the district; but for external trade mules are more used. The trade from Kushmeer to the west passes through this district, which also lies in the great road from Hindoostan to Peshawur and Cabul.

Huzara.

202. This is a small district, unworthy of much mention. Tillage is the chief subsistence, and the chief products are said to be wheat, barley, and mash. It has some streams from hills, and the amount of irrigated lands is equal to the lulm. Sheep are perhaps the chief stock. Provisions are not so cheap as in Chuch, and there are more wastes. The villages on an average have 80 houses. The natives drink from springs, rills, and tanks, and their chief fuel is shrubs.

Moozuffurabad.

203. Concerning this district, I have gathered but little, nor is it of much importance either from its produce or position. The cultivation is but little, and is irrigated. A little wheat is imported, and a little rice exported. Timber, fuel, and grass are easily procurable. The live stock is various, and the chief carriage, at least to Kushmeer, is on the backs of men. The pasturage is important.

Kushmeer.

204. This celebrated valley is admirably watered by streams and rills, which seldom fall below a convenient level. The quality of the soil is excellent, and adapted for the culture of rice, a grain which supports a great population; and the inhabitants are industrious and frugal. Very little of the produce is expended in the support of animals. There are few countries of the same extent so populous as Kushmeer. The capital cannot have less than 100,000 inhabitants, and is decidedly the largest city

in the Cabul dominions. On the mountains are fed numerous flocks of sheep, which are here a very valuable stock, yet are cows, on the whole, kept to a greater value. There are no buffaloes or camels. The chief carriage within the valley is by boats, and with most of the neighbouring districts by the labour of men. The quantity of rice produced far exceeds all the other grains and articles of food. A Kushmeeree eats wheat as a curiosity. That, like all other things, is sown in the spring. Saffron is cultivated lulm, and some of the gardens receive no water. The fruits and the palez are inferior in quality to those of Cabul, and the rice is of a coarse kind, but productive. Flesh is dear, timber and fuel cheap. The produce seems to be equal to the consumption and no more, nor could Kushmeer be easily made to yield supplies to an army not quartered in it, for the access is difficult, and carriage expensive. Fodder is plentiful, and especially rice straw, with which many of the poor thatch their houses; but in general the tops as well as the walls of the houses are of wood. The natives are proverbially unclean. The trade of Kushmeer is great, and already well known in Europe.

Rajiver, &c.

205. The southern dependencies of Kushmeer are well watered vallies, of which the chief produce is rice and maize, and the chief live stock cows and buffaloes. Wood and fuel are abundant, and the houses, whether of stone or wood, flat-roofed with timber. Provisions are cheap. The villages are small, but numerous in the bottoms, though there be much uninhabited space among the mountains.

Pothwar, &c.

206. Pothwar has a sandy soil of very poor quality, but a portion of all the three rains. Wastes are to be found, sometimes stony, sometimes broken ground, but on the whole the quantity of ground cultivated may excite surprize. The chief crop is the khureef, and bajra the bread corn of the people. The grain gives but a small produce on a given surface. There are some towns, but villages are small. Wood is dear, and part of the houses are thatched, part flat-

roofed. Some horses are bred here, and the number of live stock is considerable, so that fodder is dear. Grain is sufficiently cheap, and a small quantity is exported to Peshawur, to which they also send ghee. They and their live stock often drink from the same tanks. The number of small tanks is very great, and there are some wells in low situations for drinking. The few lands that are irrigated are chiefly watered from wells in hollow places, and are under tobacco, garden vegetables, and other valuable cultivation. Rice, sugar, maize, and chuna are scarcely cultivated, and more barley is raised than wheat. The chief fuel is cow dung, and the chief carriage, bullocks and mules. Though I have little detailed information concerning the remainder of this Dooab, to the south as far as the dominions of Mahmood Khan, I conceive that it answers in most particulars to the character now given of Pothwar.

Ghuznee, &c.

207. In this country the chief subsistence is from tillage. At the same time the pasturage is important, and being more mentioned in the neighbouring districts, the inquirer at first is led to suppose that it is the chief object. On the whole sheep are certainly the chief stock, but in some well cultivated parts cows are kept to a greater value. There are no buffaloes. The chief carriage is by camels. The quantity of khureef raised is very inconsiderable, and by far the greatest product is wheat, which is exported to Cabul; after wheat is barley, which in general is sown in the spring, in the coldest situations, for example, Khurwar. The wheat also, and indeed every thing cultivated is spring-sown. The quantity of irrigated lands exceeds the lulm, which itself has often the advantage of khwurs; the irrigated lands have water from streams and kharezas, never from wells. The quantity of palez is not very great, and there is but little fruit except in the environs of Ghuznee. The natives drink from springs, rills, and kharezas. Near Ghuznee is a dam still in good preservation made by order of Shah Mahmood Ghuznuwee; it is filled partly by rain, partly by springs and rills, and its water is used in irrigation. For fuel the natives use shrubs, the dung of cows, or that of

Inscription No. 3 from the fort of Benur in Nagree Character

1

हषेधेर्य्यम्   धर्म्यंकुरुनियम्यच्चक्रतुमनिस्म

त्वेव्ययादिकार्य्येम   त्र्यम्बकायपार्वत्यैच ब्र

ह्मक्रियारम्भेव्ययोधर्म्यः॥ज्ञातरेपायेयंदेयंती

येपरेषु॥परत्याज्ञाविरोधेन   लब्धोपाप

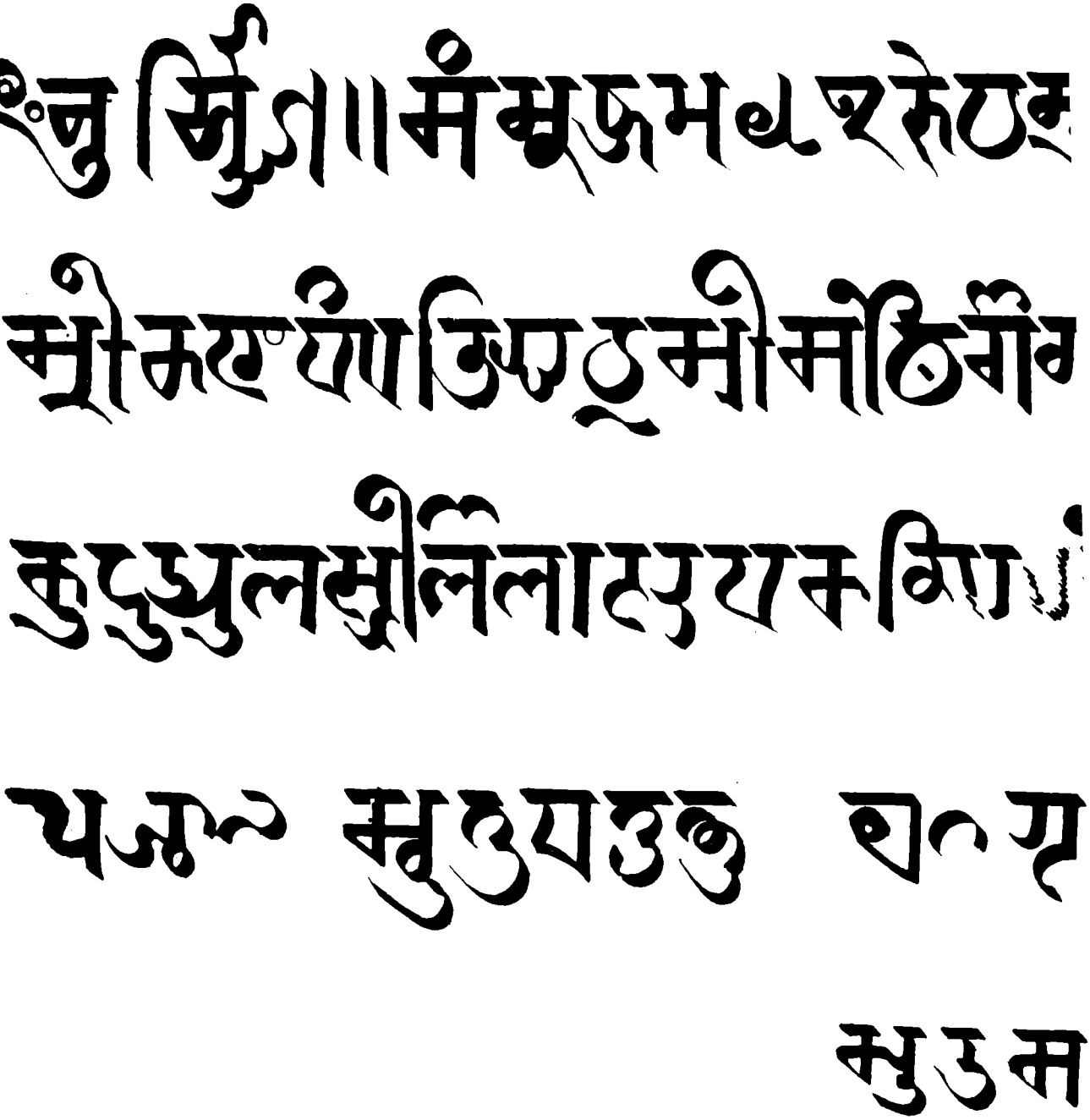
क्षेत्रोपरिकुक्रियाकार्य्यात्याज्न्या॥

कार्य्याधिकारिक   याज्ञिकशिक्षकापत्या

प्रजाधिपलाविनः   व्ययेपि ताप   पीनका

येमम   श्रेणयः   चय   विक्रयेण

२



sheep, according to circumstances. Timber is exceedingly scarce, and hence the houses are generally of the vaulted kind. A part of the population is in summer under tents, and in winter they flit to warmer climates. Fodder is moderately abundant. There are considerable spaces without cultivation, and the population on a given surface is much inferior to that in the valley of Cabul.

Jajee.

208. This is a narrow valley, and its climate is cold; the stream ultimately joins the Koom. The stream natives mainly subsist by tillage, and the chief products in their order are wheat, barley, rice, and pease. The lands are watered. The chief stock is goats. Timber, fuel, and fodder are abundant, and some provisions are exported to Cabul, to which they also send some planks of pine, about six or seven feet long. The carriage is on mules, for the nearest road to Cabul (with which they have most intercourse) is not practicable for a bullock or camel, it is called the road Goubund. The natives live in flat-roofed houses, and have no tents. The population is but small, and there is no large village.

Notice of an inscription in Behar, communicated by MR. RAVENSHAW, *as published in the May number of the Journal*, 1839.

The Editors of the Journal noted (vol. viii. page 347,) in announcing the communication by Mr. Ravenshaw of certain impressions of very ancient inscriptions from Behar, that "the most important and interesting of these impressions were so imperfect, and confused, as to baffle the attempts of the Pundit Kamala Kanta, who aided Mr. James Prinsep in his valuable discoveries. We allude particularly to the inscriptions on the inverted column in the Fort of Behar."

I have now the pleasure of laying before the readers of the Journal a rendering of one of these inscriptions as decyphered by Pundit Kamala Kanta Vidyalanka, and Baboo Hurrinboonath. They succeeded in giving this interpretation after a great expense of time and labour. The characters are of a class

4. That it possesses, besides, great inducements to men of capital to employ their money productively here; the timber forests, the tin, iron, and coal mines, besides other spontaneous productions of nature, being inexhaustible riches of value.

5. That mercantile speculations cannot be remunerating at present, there being scarcely any demand for foreign produce.

6. That the situation of the country is such, as to point it out as the commercial high road in the north between China; and in the south, between Siam and British India.

NOTE.—The MS. from which this valuable report was printed abounds with copyist's errors, on which it has been sometimes impossible to venture even a conjectural correction.

Memoir on the Climate, Soil, Produce, and Husbandry of Afghanistan and the neighbouring Countries.—By Lieut. IRWIN.[1]

PART IV. *(Continued.)*

Toree.

209. The climate is here milder. The chief products are rice and mash. The lands are irrigated, the houses flat-roofed; timber, fuel, and fodder are easily had. The chief live stock is goats, and next, cows and buffaloes. The carriage is by mules, and the natives carry rice and mash to Cabul from their own valley, as also salt from the eastward. The cultivation is considerable, and the villages Zeran and Koorman are long ones.

Upper Bungush.

210. This country seems to correspond in most circumstances to that of Toree. The chief town is Honga, which has 400 houses. The country is strong, and is under its own chief, whom the king seldom displaces. It yields good honey, and is well wooded and watered. Rice is exported to Cabul, generally by the road of Ghorbund. The vallies are well inhabited. But little use is made of tents.

[1] Continued from p. 65, vol. IX.

Khost, &c.

211. Khost and some neighbouring vallies are well watered, and the chief product is rice. The mountains which confine them, afford the natives plenty of timber, fuel, and pasturage. Cows, buffaloes, and goats are the chief stock. Little information is to be gained concerning this part of the Cabul dominions. It may be observed of the eastern parts of that monarchy, that the middle portion of it although not remarkably unfruitful, contributes very little either in men or money to the public strength. Tamerlane made his march to India from Toorkistan through Ghuznee, and thence by the road called Hazar-durnkht, which penetrates the Jadran range, he reached the low country, which is watered by the Koorm, and its numerous branches. In modern times, Cabul is a place of more note than Ghuznee, and the northern road to India through Cabul and Peshawur is the frequented one; in every point of view it is preferable to the middle one. The great southern road from Persia and Khoorasan leads through Candahar, either to Deraghzee Khan or to Shikarpoor, and it is also preferable to the middle one in most points of view. The vallies of Khost, &c. are well cultivated, and their lands irrigated. In former times a greater number of Ghiljies resorted to this quarter for pasturage in the winter than now.

Jadrans, &c.

212. The Jadrans and Mookbuls live in a rude state, in very small villages, and their chief subsistence is from their flocks of goats; after which, we may reckon their fields, which yield them wheat, rice, and some other things, and are in general irrigated. They receive some provisions from the Jajees and Torees, after whom the vallies of Jajee and Toree are named, and merchants from Cabul carry cloths, &c. into their country, bringing back ghee of goats' milk, and some goats. The country is very strong, and never pays revenue, nay, in the present low state of the royal authority, certain petty chiefs of the Jadrans have compelled their neighbours on the skirts of the table land to pay them revenue instead of the king. They use partly houses and partly black tents, which they make for themselves of goat hair.

Foormul.

213. This is a small district, but has been mentioned in history, and has found a place in maps already existing. It is situated near the junction of the Jadran range with the range of $32\frac{1}{2}°$. It is drained to the eastward into the Koorm, whereas the country called Zoormul, which lies west or north-west of it, composes part of the table land of Ghuznee, and is drained south or west. The inhabitants of Foormul speak Persian, and reckon themselves 4000 families. The chief town or village is called Orgun, and may have 1000 families; there is no other village of any importance. The people subsist by tillage, and also carry on a considerable trade, conveying salt and iron from the eastward to Cabul. Their chief stock is perhaps cows and goats; and camels are the chief carriage. Their hills abounding in pine, timber and fuel are easily procurable. Their houses are flat roofed. They raise quantities of good apples, and sell a small quantity of grain to their eastern neighbours, the Wuzeerees.*

The chief products are wheat and barley, and they raise a little maize.

Kohat.

214. This is an agricultural country, and the two crops are probably equal. The chief products are rice and wheat; some provisions are exported to Peshawur. The lands are commonly irrigated, and that chiefly from springs. The wheat and barley are autumn sown. For fuel they burn olive and shrubs, and timber is procured from Upper Bungush. The houses are flat roofed; cows are the chief stock, and camels the chief carriage. The inhabitants drink chiefly from springs. Kohat may have 5000 inhabitants. The villages are small, and on a given surface the populousness of their districts is less than that of Peshawur. At Kohat they cultivate grapes, figs, and mulberries, and but little other fruit; the perfume they extract from that species of the willow called Bedi mookh, is much esteemed.

* These live in a rugged country, and derive their subsistence from tillage and from flocks of goats.

Malgeen.

215. In this country, which belongs to the Southern Khutuks, the chief subsistence is from tillage; near Malgeen there is more rubbee, and wheat is the chief crop; but near Toree, which lies on the road to Bunnoo, the khureef is greater, and bajra the chief crop. Very few of the fields are irrigated, some bajra is said to be exported to Bunnoo, and a great part of the kingdom is supplied with salt dug in this district; the trade of salt is chiefly in the hands of strangers. The villages are generally small, and there is much waste; for fuel they use shrubs, and they drink from streams, springs, and tanks. In the quarter of Toree are some wells; cows are the chief stock; bullocks and camels perhaps the chief carriage. The natives live in flat roofed houses; those who visit the neighbouring hills in summer, use, I believe, partly black tents, and partly rude sheds of shrubs and grass.

Bunnoo.

216. Bunnoo is an agricultural country, and is well cultivated and peopled. The khureef is the chief crop, and barley, rice, maize, and wheat are said to be the chief products. Some rice and coarse sugar are exported, some wheat and bajra imported. The villages are very numerous, but small. All the lands are watered from branches of the Koorm, but some of the natives drink from wells. Timber is cheap, being brought down on the river, and the houses are flat roofed. For fuel they burn both wood and dung; straw is cheap; provisions are cheaper than at Peshawur. Bullocks are the chief carriage; cows and buffaloes are kept to an equal value. The turmerick of Bunnoo is exported to all quarters. There are no wastes except on the frontiers of this district.

Eesa Khel.

217. This is a narrow district, but is well cultivated by independent farmers. It is best peopled towards the Koorm, where they water the lands from a cut they have drawn from that river. In the northern quarter towards Kalabagh, the lands are lulm, but have the advantage of khwurs. In neither is it easy to find a well. The natives drink from the

Meteorological Register, kept at the Surveyor-General's Office, Calcutta, for the Month of May, 1840.

Day of the Month.	Moon's Phases.	Minimum Temperature observed at sun-rise.						Maximum Pressure observed at 9 h. 50 m.						Observations made at apparent Noon.					
		Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of an Evapg. Surface.	Wind. Direction.	Aspect of the sky.	Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of an Evapg. Surface.	Wind. Direction.	Aspect of the sky.	Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of an Evapg. Surface.	Wind. Direction.	Aspect of the sky.
1		....	....	....	....	.....	.....	30,504	81,5	79,2	78,0	E.bS.	Overcast showery	29,464	82,4	84,5	81,5	.....	Gale from the South. Nimbi
2	○	29,700	81,9	80,9	79,2	S. ..	Cloudy.	,724	84,9	88,1	83,5	S.high	Detached light Clouds.	,724	86,4	87,0	83,9	S. ..	Cloudy. (showery.
3		,748	81,6	80,0	78,0	S. ..	Detached Clouds.	,804	85,0	87,5	83,7	S. ..	Detached light Clouds.	,792	85,9	90,6	84,3	S. ..	Detached Cumuli.
4		,684	81,5	80,5	80,0	S. ..	Clear.	,736	85,3	89,7	83,0	S. ..	Cumuli and Haze.	,720	87,6	91,2	83,9	S. ..	Cumuli, and Light Haze.
5		,725	80,0	77,5	76,0	S. ..	Generally Clear.	,762	85,3	88,0	82,0	S. ..	Cloudy.	,760	86,8	90,0	82,2	S. ..	Cloudy.
6		,710	78,0	74,5	73,5	S. ..	Cloudy (Nimbi.)	,743	82,9	86,0	83,0	S. ..	Scattered Clouds.	,743	85,6	89,5	83,8	S. ..	Cloudy.
7		,709	72,2	77,5	75,5	S. ..	Nimbi interspersed.	,760	81,0	80,9	77,5	S. W.	Hazy.	,760	82,0	85,5	80,0	S. ..	Light Clouds.
8	)	,722	77,5	78,5	78,8	Calm.	Cloudy and foggy.	,788	82,5	88,0	83,5	S. W.	Detached Cumuli	,772	84,9	92,2	84,8	S. E.	Cumuli.
9		,790	79,5	79,4	79,0	S. W.	Light Clouds.	,845	83,9	88,0	83,5	S. W.	Cumuli.	,842	87,5	92,0	83,9	S. ..	Cumuli.
10		,794	81,0	79,0	79,0	S. E.	Generally Clear.	,860	85,5	88,6	83,9	S. W.	Cumuli.	,850	86,8	93,5	84,0	S. W.	Cumuli.
11		,810	80,7	76,5	75,0	Calm.	Cirro-strati.	,856	83,9	89,0	80,8	S. W.	Light Cirro-strati.	,849	86,5	95,8	85,0	W. ..	Clear.
12		,794	81,5	80,0	80,0	Calm.	Clear.	,844	85,7	94,5	85,7	N. W.	Cumuli.	,820	86,8	97,5	86,2	S. W.	Cumuli.
13		,782	81,8	81,5	80,0	Calm.	Haze.	,832	85,9	89,5	82,5	Calm.	Hazy.	,813	88,2	94,8	85,0	S. W.	Haze to the N. Cumuli.
14		,750	82,5	81,3	77,0	S. ..	Clear.	,800	87,6	93,0	85,1	S. ..	Clear.	,789	90,3	97,0	87,8	S. ..	A few Cumuli.
15		,752	82,2	78,0	77,0	E. ..	Clear.	,817	86,5	90,4	84,9	S. ..	Cumuli.	,807	89,4	92,8	85,0	S. ..	Cumuli. Cloudy occasionally.
16	●	,740	80,0	74,3	74,2	S. ..	Cirro-strati.	,770	83,5	86,0	81,2	N. E.	Cirro-strati.	,768	85,0	89,5	83,0	S. ..	Cloudy.
17		,712	81,0	78,5	78,2	Calm.	Cirro-strati.	,778	84,5	90,3	82,5	S. ..	Cumuli.	,762	85,5	92,5	83,0	S. ..	Cumuli.
18		,752	83,0	81,6	81,9	S. E.	Cirro-strati.	,828	86,5	91,0	85,9	S. ..	Cumuli.	,802	89,5	94,5	86,0	S. ..	Cumuli.
19		,712	84,0	83,0	81,5	S. ..	Cirro-strati.	,778	86,5	89,2	85,0	S. ..	Cumuli.	,776	89,3	92,9	86,5	S. ..	Cumuli.
20		,709	81,2	77,0	77,0	E. ..	Cirro-strati.	,786	87,0	89,5	35,0	S. ..	Cumuli.	,753	88,7	92,7	85,9	S. ..	Cumuli.
21		,684	83,4	82,5	81,8	E. b S.	Cloudy.	,737	87,4	90,8	84,9	S. ..	Cumuli and Haze.	,722	90,1	93,5	86,5	S. ..	Cumuli and Haze.
22		,688	83,8	82,5	81,6	S. ..	Cirro-strati.	,712	87,9	90,8	84,2	S ..	Cumuli and Mists.	,700	90,4	93,2	86,2	S. ..	Cumuli.
23		,707	84,0	80,9	80,5	Calm.	Cloudy.	,720	86,5	89,4	85,2	S. ..	Cloudy.	,710	88,7	90,3	84,3	S. ..	Cumuli and Haze.
24	(	,616	82,2	79,0	77,0	S. ..	Cloudy.	,684	84,3	87,5	84,9	S. ..	Cumuli.	,670	86,0	89,5	84,0	S. E.	Cumuli.
25		,680	83,8	81,3	80,0	S.bW.	Cloudy.	,744	86,7	89,5	83,5	S. ..	Cumuli.	,736	88,0	92,7	85,9	S. ..	Cumuli.
26		,676	81,2	78,0	77,0	E. ..	Cloudy.	,762	86,7	88,2	83,2	E. ..	Cumuli.	,744	87,0	89,0	84,0	E.bN.	Cumuli.
27		,680	84,0	82,8	82,0	S. ..	Cloudy.	,750	87,6	90,0	85,8	S. ..	Cumuli.	,738	89,6	93,2	87,0	S. ..	Cumulo stra. and Nimbi.
28		,680	81,3	76,8	75,9	Calm.	Cloudy.	,736	86,0	89,0	85,3	E. ..	Cloudy.	,722	87,9	93,2	86,9	S. ..	Cumuli.
29		,729	80,0	74,2	73,8	S.b.E.	Cloudy.	,786	86,9	89,5	84,0	S. ..	Cumuli.	,774	88,5	91,0	84,5	S. ..	Cumuli.
30		,770	82,2	77,8	77,0	S. ..	Cloudy partially.	,804	86,2	89,0	84,9	S. W.	Cloudy.	,786	88,2	91,0	85,2	S. ..	Cumuli.
31	○	,720	82,3	78,0	77,5	Calm.	Cloudy.	,756	86,0	89,3	85,0	S. ..	Cumuli.	,724	88,6	92,0	85,5	S. ..	Cumuli.
Mean.		29,724	81,5	79,1	78,2			,768	85,4	88,7	83,6			,755	87,4	91,7	84,7		

Month.	Maximum Temperature observed at 2 h. 40 m.							Minimum Pressure, observed at 4. p. m.						Observations made at sun-set.						Rain Gauge.	
	Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of an Evapg. Surface.	Therm. exposed to the rays of the sun.	Wind. Direction.	Aspect of the sky.	Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of an Evapg. Surface.	Wind. Direction.	Aspect of the sky.	Barometer.	Temperature. Of the Mercury.	Temperature. Of the Air.	Temperature. Of an Evapg. Surface.	Wind. Direction.	Aspect of the sky.	Upper.	Lower.
1	[illegible]	82,6	82,9	79,7	....	....	Blowing a gale from the S., & drizzly occasionally.	29,424	83,3	83,0	79,9	....	Blowing a gale from the S. & drizzly occasionally.	29,420	83,0	82,8	79,5	.....	Blowg. a gale from the SW. with occas. mizg. rain.	1,14	1,25
2	,720	85,8	87,6	84,0	....	S. ..	Detached Clds. occasl. sunshine.	,720	85,3	87,0	83,9	S. ..	Cloudy.	,722	84,8	84,6	82,8	S.....	Light cir.-str. interspersed		
3	,741	87,0	92,0	84,9	121,5	S.....	Detached light Clds.	,710	87,0	89,8	84,0	S. ..	Cloudy.	,718	86,9	87,2	82,9	S.....	Scattered Clouds.		
4	,672	87,1	90,0	82,8	111,0	S.....	Cumuli and Light Haze.	,666	86,8	88,6	82,5	S. ..	Light Haze & cum. cldy.	,674	85,5	85,0	81,0	S.....	Cloudy on the Hor.		
5	,718	86,9	91,2	83,2	....	S.....	Cloudy.	,700	86,7	90,8	85,0	S. ..	Cloudy. [occasionally.	,709	86,0	87,5	82,5	S.....	Cloudy. [rally Clear.		
6	,720	84,0	86,8	83,0	....	N. W.	Nimbi Rain.	,720	84,5	87,6	82,0	S. ..	Cloudy.	,729	84,3	86,5	81,9	S.....	Cloudy.	0,76	0,84
7	,702	83,5	89,5	83,6	....	S. W.	Cumuli.	,702	83,2	88,5	83,0	S. W.	Cumuli.	,720	82,8	84,5	81,8	S. E.	Light Nimbi interpersed.	0,80	0,89
8	,745	86,4	93,5	84,9	124,1	S. E.	Cumuli.	,730	86,6	90,0	83,0	S. E.	Cumulo-strati.	,736	89,5	86,8	82,0	S. ..	Clear.		
9	,790	87,7	93,0	84,0	123,9	S. ..	Cumuli.	,762	87,5	91,0	83,8	S. ..	Cumuli.	,770	85,9	87,0	81,9	S.....	To the N. Cum-strati.		
10	,800	88,3	94,4	84,6	127,0	S. ..	Cumuli.	,800	88,5	93,5	84,8	S. ..	Cumuli a few.	,809	86,8	88,5	83,0	S.....	Clear.		
11	,804	86,5	98,5	86,9	130,2	W. ..	Clear.	,790	86,5	97,0	85,9	W. ..	Clear.	,790	86,0	90,5	83,0	Calm.	Clear.		
12	,757	88,2	102,5	87,2	140,0	N. W.	Cumuli.	,744	88,2	99,2	86,2	N. W.	Cumuli.	,747	87,6	91,5	84,0	Calm.	Haze.		
13	,750	89,5	97,3	85,9	134,5	S. ..	To the N. Cumulo-strati.	,730	89,4	96,8	85,5	S. ..	Cum-strati.	,739	87,5	90,0	84,2	S. E.	Generally Clear.		
14	,740	91,2	97,5	88,0	131,0	S. ..	Cum. str. Zenith Clear.	,719	91,1	95,2	86,0	S. ..	Clear.	,724	88,0	87,5	82,1	S. E.	To the N. Cum.-str.		
15	,744	89,7	92,5	85,7	119,5	S. ..	To the N. Cumulo-strati.	,742	89,9	91,0	84,2	S. ..	Cloudy partially.	,752	87,8	86,5	81,2	S.....	Cloudy and Hazy.	0,31	0,34
16	,680	86,3	91,6	84,3	117,2	S. ..	Cloudy, Cum-strati.	,562	86,3	90,0	84,0	E. ..	Cloudy.	,675	85,7	87,0	83,2	E.bN.	Cloudy.	1,34	1,54
17	,714	86,8	94,0	85,6	121,5	S. W.	Cumuli.	,700	86,4	90,2	84,8	S. ..	A few Cumuli.	,706	86,0	87,5	84,0	S. ..	Clear.		
18	,761	90,5	95,0	87,0	125,0	S. ..	Cumuli.	,752	90,0	93,0	85,5	S. W.	To the N. Cumuli	,743	88,5	88,9	83,0	S.....	Cirro-strati.		
19	,720	90,8	95,9	88,2	120,2	S. ..	Cumuli.	,702	90,0	93,2	87,0	SSW.	Cumuli, Haze to the N.	,720	81,0	75,0	73,0	N. E.	Nimbi interspersed.	0,32	0,37
20	,708	89,7	92,5	87,0	118,0	S. W.	Cumuli.	,668	89,5	91,5	86,8	S. W.	Cumuli a few.	,674	86,3	88,0	85,2	S.....	Scattered clouds.		
21	,692	90,5	93,2	87,6	121,0	S. W.	Cumuli.	,674	90,5	92,9	86,5	S. ..	Cumuli a few	,680	88,0	88,2	82,4	S.....	Generally Clear.		
22	,642	90,4	93,0	85,9	115,0	S. ..	Cumuli.	,630	89,8	91,0	86,0	S. ..	Cloudy.	,642	81,5	76,0	75,2	N. E.	Nimbi interspersed.		
23	,656	88,9	91,0	84,8	111,5	S. ..	Scattered Clouds & Haze.	,650	88,0	88,8	83,5	S. ..	Cloudy.	,670	86,6	86,7	83,2	S.....	Cloudy Thundering.	0,69	0,77
24	,630	88,5	92,6	84,6	116,0	S. ..	Cumulo-strati.	,610	87,5	87,6	84,0	S. ..	Cumuli	,616	85,8	86,5	83,5	S	Cirro-strati.		
25	,690	89,2	93,0	87,3	....	S. ..	Cloudy.	,666	86,0	86,2	81,8	S. E.	Nimbi (Showery.)	,674	83,2	81,0	80,0	S. E.	Nimbi Thunder.		
26	,722	87,0	93,0	86,0	115,2	E. ..	Cumuli & partial Haze.	,700	87,0	93,0	86,0	N. E.	Hazy.	,708	85,5	87,0	83,9	N. E.	Cloudy.	0,65	0,74
27	,686	90,7	93,2	85,5	115,0	S. ..	Hazy and Cum.	,654	90,3	92,4	85,0	S. ..	Clear.	,658	87,2	88,0	84,5	S.....	Cloudy to the NW.		
28	,700	89,6	93,5	85,0	127,0	S. ..	Few Cumuli.	,680	89,0	92,5	85,5	S. E.	Generally Clear.	,700	86,5	87,2	83,0	S.....	A few Scattered Clouds.	0,74	0,80
29	,732	90,0	93,0	81,0	119,0	S. ..	Clear.	,716	89,8	92,0	83,0	S. ..	Clear.	,720	87,0	87,9	82,8	S.....	Cirro-strati [Light.]	0,39	0,43
30	,758	88,9	82,0	84,4	116,9	S. ..	Cumuli.	,702	88,8	91,2	84,0	S. ..	A few Cumuli.	,712	85,6	86,8	82,5	S.....	Cum. str. on the Horizon.		
31	,708	90,0	94,0	86,0	124,0	S. ..	Cumuli.	,670	89,5	92,0	85,0	S. W.	Generally Clear.	,674	87,7	88,0	82,5	S.....	To the N.&N.E.Cum.-str.	0,05	0,08
Mean.	,711	88,1	92,9	85,1	121,6			,693	87,8	91,2	84,4			,701	85,7	86,3	82,1			7,19	8,05

Indus and from canals for irrigation. Grain is exported to Kalabagh, and probably other quarters. The two crops are perhaps equal, and wheat the chief product. They live partly in thatched and partly in flat-roofed houses.

Moorwuts.

218. This tribe lives south of Bunnoo, and their country is by some included in Daman, by others not. The product seems to be bajra, and most of the lands are lulm. Their chief stock seems to be cows, which they pasture in the wastes, in the same manner as many other Afghan tribes pasture their sheep; they themselves while thus occupied, live in tents made of black goats' hair, and generally fenced with shrubs. They keep a considerable number of camels; their villages are small.

Daman.

219. This is an agricultural country, notwithstanding its pasturage is so famous, for it is strangers who reap the chief advantage from it. On the whole the two crops are equal; in the southern part in which Drabund is situated, the rubbee is the greater; in the northern, in which lie Tuk and Tukwara, the khureef. The greatest product is bajra, and after it, wheat and barley. Considerable quantities of cotton are raised, and the greater part is exported to the dominions of Moohummud Khan. Bajra and jooaree are in general cultivated lulm, but other things are more commonly irrigated. The Gomul loses itself in the northern part of the Daman (see paragraph 40). There are also a few dams. Many of the natives live by trade. There is little fruit save dates; cattle are the chief stock, and their sheep are both of the heavy tailed and light tailed species. Camels are the chief carriage, and considerable numbers are bred. Some of the mountains, especially that which the Afghans call Kuse Ghur, and others Tukht-i-Sooliman, abound in fir, which afford the neighbourhood timber, fuel, and also torches. The commonest fuel however is from the Guzree, which in certain quarters covers great spaces of uncultivated ground. The natives live in flat roofed houses, excepting those who go and come between the lower and upper country for the sake of

trade. The villages, with some exceptions, are small, and there are wastes of considerable extent. The term Daman is by some applied to a great extent of hills of moderate temperature which lie west of Daman, properly so called, and by that mode of reckoning, the Sheeraness, Oostwanees or Troorianees (as they are more properly called) Doomtanees, and part of the Wuzurees would be considered as inhabitants of the Daman; their country is very waste and ill peopled, but in the winter there is a great resort of the Ghiljies and others, chiefly from Zoormul, for the sake of pasturing their sheep. These strangers think they have a right to a pasturage without stint. Those who proceed onwards to the plain and into Mukulwad are compelled by Moohummud Khan to pay a tax for the grass they consume. In this hilly part of the Daman the rubbee is the chief crop, and cows and goats the chief stock. They drink from springs and streams, in the plains there are also some wells; the inhabitants of the hills make some use of tents.

Mukulwad.

220. Tillage is the chief source of subsistence, and the crops I conceive to be nearly equal. Wheat, barley, chunna, and jooaree are the principal things raised. There is little grain exported or imported; most of the lands are lulm, a part of the rubbee being raised on moist lands, which during the rainy season had been covered by the rain; but the quantity of sunk lands is here much less than in the Kuchhee, which is east of the river in Mooltan, or Buhawulpoor. I have formerly mentioned that such lands form a class by themselves, and are called *seo* (see paragraph 166). There is but little good timber within this district itself, yet they have flat roofed houses covered with wood of the date tree, guz, and sheeshum which grow in the country, and some with wood from other quarters. The guz and shrubs are the chief fuel, and are cheap. Fodder is moderately cheap, though the hard clay of this district be naturally ill clad with grass; the soil is not the most favourable for many species of grain, but the present desolated condition of the district is chiefly owing to the oppressive government. There are considerable spaces of hard clay

without cultivation or much jungle. In the southern part we find a great deal of thick thorny jungle growing on a good soil. The villages are small. The chief carriage is by camels and asses. Cows and sheep are the chief stock, and in some places buffaloes exceed any other stock.

Kuchhee of Moohummud Khan.

221. This tract has a great deal of seo land, and the rubbee is by far the greatest crop. The villages are of moderate size; some tracts of good land are covered with grass jungle, and some of the houses are thatched. Fodder and fuel are plentiful. Great quantities of turnips are raised, and provisions of most kinds are cheap. The chief carriage is by camels, but the petty trade of the country is carried on asses. The people drink from wells.

Thun of Moohummud Khan.

222. In this tract are kept great numbers of sheep; and pasturage is fully as important as tillage. Where water is moderately near, they raise barley and some wheat by means of wells, but they have no chunna. The khureef crop is much the greatest, and is perhaps all lulm, and comprehends scarcely anything but bajra and moth. The villages are very small and at great distances. The ground is chiefly covered with a jungle of grass and thorny shrubs. The houses are thatched. Grass proper for fodder is very scarce; nor is there any timber, but there is abundance of fuel from shrubs. Camels are the only carriage. Some grain is imported from the Kuchhee.

Dera Ghazee Khan.

223. This is an agricultural district; towards the river are some seo lands on which they cultivate rubbee, especially wheat. On the upper grounds they raise the khureef which is the greater crop, and is partly lulm, partly irrigated. Towards hills the lands are all lulm, except where there are some insignificant streams or dams. The irrigation from jhulars is more common than from wells. Jooaree is the chief crop. The villages are small, and there is a good deal of waste, both hill and plain;

in other circumstances this district much resembles the preceding.

Dagul.

224. This is a sandy and desert tract, in which bajra is the chief produce; the natives drink from tanks and deep wells.

Shikarpoor.

225. Here, as in Dera Ghazee Khan, jooarèe is the chief crop. The proportion of irrigated lands is greater, and the jhular is most used, this district being intersected by branches of the Indus, natural or artificial. The khureef is the greater crop; the villages are of considerable size. The cultivation is considerable, but some supplies of grain are drawn from the west and north. In the town the houses are flat-roofed, but in the villages thatch is more common. The town carries on a considerable trade, chiefly with Candahar, and natives of this place, or whose ancestors have been natives of it, reside in the principal towns of these kingdoms, even as far as Bokhara, acting principally as correspondents to houses in Shikarpoor.

Seeweestan.

226. This is an agricultural country, and exports grain to Shikarpoor, Kilat, and perhaps some other quarters, but its own population is but inconsiderable. The chief place is Gunduwa, which is reckoned to have 12000 houses, including its villages. There is here a stream called Punjwahee, from which they irrigate their fields. Another small stream is divided equally between Dhadur and Sewee. Those places of Seeweestan, which are situated to the north, have often small streams from the hills of the Afghans, to the north of them; still there is more lulm than irrigated. There is very little irrigation from wells. A common practice is to make a bank to confine the water, which after rain is collected on the low grounds, and as soon as any place becomes moderately dry, they sow their crops on the moist land. The chief crops are jooaree and moth. There is no sugar raised in this country. Their wheat and barley is but little, and for the most part irrigated. Cotton is raised to a considerable extent.

There are large spaces uncultivated, though it is certain that cultivation by wells would succeed in most of them. The villages are small and defenceless. The houses in general are thatched, and as unsubstantial and cheap as in any part of India. In some quarters those who attend the live stock in their pasturage, shelter themselves under mats. In the winter come down Bulochees from the west to pasture their sheep. It is difficult to tell what is the chief stock of this country. The natives live on vegetable food. There is little wood either wild or cultivated, the best supply is from the babool tree. The chief fuel is guz.

Shal and Mustoong.

227. These places are about a day's journey distance, and they are commonly coupled together in conversation. Kirta is about eighteen miles west of Dhadur, and has little cultivation. It is the last place in Seeweestan, and from it they reckon thirty-four coss, or fifty miles, to the town of Shal, the intermediate space being uncultivated, and even but little visited by the shepherds. Part of it is the high and cold plain called Dushti-be-daulat, which is a long day's journey broad, and has no water. The temperature of Shal and Mustoong is little warmer than that of Kilat. The only crop is the rubee, which is irrigated from one or more streams. The people generally live in houses, which are flat-roofed. Timber is to be had for their small consumption, and fuel is cheap. The natives subsist by agriculture. They are but few in number. Shal may have 1000 houses, and Mustoong is larger. All the other villages may be equal to Shal. These places are under Mahommud Khan of Kilat, and are in Bulochistan. This country, generally speaking, is included in the ancient geographical division of Khoorasan, but in the present times Bulochistan and Khoorasan are often contra-distinguished. With Shal and Mustoong begin new manners and practices in domestic economy, for here the people make that hard species of cord, known by the name of Kooroot, and which is not made in Seeweestan by the people of Indian race, who are the most numerous of those who dwell there.