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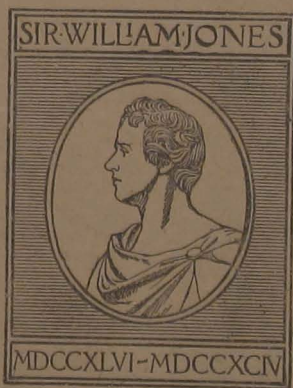
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DIARIES OF TWO TOURS IN THE UNADMINISTERED
AREA EAST OF THE NAGA HILLS.

BY

J. H. HUTTON.



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DIARIES OF TWO TOURS IN THE UNADMINISTERED AREA EAST OF THE NAGA HILLS.

By J. H. HUTTON.

FIRST TOUR.

APRIL, 1923.

The following notes were taken in the course of a tour made by Mr. J. P. Mills, I.P., and myself to a part of the Naga Hills which, as far as is known, has never been visited by any white man, except for the tour made for survey purposes by Lt. (afterwards General) Woodthorpe, R.E., in 1876, when he made a journey through some of the villages with which this diary is concerned. Occupied by the necessity of making maps against time, Woodthorpe must have had even less opportunity for anthropology than we had, and that was so little as to consist in taking occasional notes of anything that happened to catch our attention, to which I have added such observations as occurred to me at the time or afterwards.

Strangers passing with a strongly armed party through villages whose attitude can hardly be less than suspicious at the best, and is always liable to turn to active hostility as the result of any trifling misunderstanding, do not get much chance of getting to know the people, and this must be particularly the case when the responsibility for their personal safety does not rest with themselves, so that they can go nowhere without armed sentries standing over them like warders guarding a recaptured convict. Capt. W. B. Shakespear, who commanded our escort, and who should at least have a sort of a family feeling for ethnology, was sympathetic but taking no risks, and in addition to these obstacles, much of our time was inevitably taken up with transitory matters of politics, supplies or transport arrangements. On the top of all we had to contend with consistent bad weather. A succession of very rainy days not only dilutes enthusiasm, but very much limits opportunities. One advantage we had, which does not always attend such trips; our escort included two pipers and a drum, which in the shyest of villages succeeded in luring from obscurity a few of the more curious or musically inclined. Even so, it is possible that our hosts regarded our tunes as intended to blight their crops, although in April, the month of the tour, wind instruments are in season in most Naga tribes.

I should add that one of the first objects we had, was to visit the Konyak Naga village of Yungya in connection with a recent raid in the course of which men of that village had wounded a man of the village of Kamahu, pursued him on to the administered side of our frontier and there had killed him and taken his head.

the village. Even the great wooden drums¹ had been dragged off into hiding somewhere for fear of what we might do to them.

April 9th.—In Yungya I noticed two Konyak customs new to me that had to do with eggs; one, which Mills says is also an Ao custom, was that of carrying about the person in hostile country a bit of egg-shell to ward off the dangerous emanations of enemies; the other, that of throwing eggs into a burning house to stop the fire from spreading. The egg is thrown into the conflagration by a wise man, or some similar sort of witch-doctor or priest with what sounds like an imprecation to stop the fire.

I observed that stones were used in building the "morungs" (bachelors' houses) as elsewhere in the Konyak country, and that the erect stones set up in front of one of them were painted in bands of reddish colour (possibly blood) alternating with equal bands of the grey stone. Red and black or black and white bands of equal breadth is a favourite pattern among Konyaks. The wooden "drums" in Kongan, for instance, are painted thus. Other morungs had unpainted stones, one or two, erect with flat ones round them² to receive the heads of newly decapitated enemies, a custom apparently followed by the Dusun of Borneo likewise.³

April 10th.—Having rained all night again, it was still raining hard in the morning, but cleared up about midday. The Kamahu people and our Changs searched for pig, but did not find very many. What there were, were hidden in holes in the ground excavated under the surface so that the pig should not root their way out. They did find a few of the Yungya heads, some of which were identified as having grown on Mongnyu and Kamahu bodies when alive. One of our Changs told us that when Shamnyu, a Konyak ("Chagyik") village, raided the Chang village of Phomhek, and lost thirty heads to it in the process, they cut off the heads of their own killed rather than leave them behind for the enemy.⁴

The Yungya trophies (Plate I, fig. 7) which led to this remark consisted of skulls decorated with horns on the lines of those I got from Yacham in November 1921.⁵

¹ Hollowed logs, made like dug-out canoes, and played by rows of men and boys hammering on the edges of the slot with mallets made like dumb-bells. See *A Visit to the Naga Hills*, by S. E. Peal in *J.A.S.B.*, I of 1872. I suppose I ought strictly to speak of them as xylophones rather than drums. They have no membrane.

² See *J.R.A.I.*, Vol. LII (Dec., 1922), Plate XV and page 243.

³ Evans, *Among Primitive Peoples in Borneo*, p. 101.

⁴ Mills suggests a reason, deduced by him from the Ao belief, that the soul is earth-bound till the decapitator of the body die, so that if the head be not taken by the enemy, the soul will be saved from this fate. This reason, however, seems to me too weak for the case. I doubt if any Naga would decapitate a friend from motives of compassion for his soul, risking the dead man's anger to perform an act naturally repugnant and normally tabooed. I think that the original motive is to be sought in the idea, which seem to underlie all head-hunting, that with the head the soul of the dead is carried off to increase the prosperity of the captor. By taking the heads of their own side the defeated raiders would carry back the souls of their own dead to add to the store of vitality, fertility and prosperity in their own village, or at any rate prevent the enemy's doing so. The practice is not unique among head-hunters, being reported from the head-hunters of Kabristan (*J.R.A.I.*, XXVII, p. 82) and also from New Zealand (*Old New Zealand*, by a Pakeha Maori, ch. III).

⁵ See *Man*, August 1922.

We brought away eighteen of the best or most typical of them. Five were complete human skulls. One of them must have died hard, for he was fearfully chopped about, and another had the jaw all broken up and an old spear-head thrust through the skull. I imagine this is to facilitate the spearing of the victim's relations or fellow-villagers, but I have not met with the practice before. Another of the trophies was a human skull wanting both the face and jaw. Grass tassels were hung where the face should have been, and an old spear-head was attached to the base. The horns were buffalo horns, and had grass tassels at the ends of them, above which beans from the huge pods of the sword-bean were strung. This sword-bean (*Entada scandens*) probably has a particular association with fertility, doubtless on account of its prolific nature. It is hung round the necks of their mithan by Semas and Lhotas and also used as a tally of loans.¹ Mills tells me that it is used for the rope at the Ao "Rope-pulling" festival,² a fertility rite, I think, and it is used in a seasonal game by most Nagas and by other tribes in Assam.³ The Angamis, and I think other Naga tribes as well, use the stem of this creeper as in intoxicant for catching fish. The grass tassels are attached to the skull to swing and rustle when the owner is dancing with it (Pl. I, fig. 6),⁴ and the same practice seems to obtain among the Dusun of Borneo again,⁵ a tribe which appears to have very much in common with Nagas. Four were human skulls, on which bears' jaws replaced the originals doubtless taken by some other sharer in the head.⁶ One skull was divided vertically, and the left half replaced by a piece of hollowed wood with a hole for the orbit. Another was human with a wooden jaw. Three were monkey skulls, representing no doubt human originals, one being surmounted by a bit of cranium and with a wooden jaw; another combined with a human jaw and with several bits of crania, presumably human, strung above it; the third simply a monkey skull with what appeared to be the jaw of a young bear. Perhaps this last represented trophies which had been burnt or in some other way destroyed or lost. One trophy consisted merely of two bits of crania on a knotted string, and two more were basket balls, of the kind familiar as the Ao symbol of an enemy's head, one with a fragment of cranium attached and adorned with the horns of a serow (*Capricornis sumatrensis rubidus*), the other without horns but with a human jaw and a fragment of bone attached to it. With one exception, the horns on all the other trophies were buffalo horns, or else wooden substitutes. The exception had horns of the domestic mithan (*Bos frontalis*).

Yungya dispose of their dead like Yacham in trees, removing the head when

¹ *The Sema Nagas*, pp. 73, 160n, 106, 244; *The Lhota Nagas*, pp. 60, 82, Mills.

² Cf. Hodson, *Naga Tribes of Manipur*, pp. 64, 133, 168, 172; Shakespear, *Lushai Kuki Clans*, p. 167.

³ *The Angami Nagas*, p. 103; *The Sema Nagas*, p. 107; Mills, *op. cit.*, p. 83; Hodson, *The Meitheiis*, p. 55; McCulloch, *Account of the Valley of Munnipore*, p. 26; Dalton, *Ethnography of Bengal*, p. 50; Playfair, *The Garos*, p. 53; Lewin, *Wild Races of South East India*, p. 102.

⁴ *V. The Angami Nagas*, p. 383 illustrn.

⁵ Evans, *op. cit.*, p. 161; Hose and McDougall, *Pagan Tribes of Borneo*, I, Plates 38, 69, and 102; II, Plate 162.

⁶ In my note in *Mau*, above referred to describing the Yacham skulls I mistakenly described such jaws as being those of pigs. Like these, they were bears'.

ripe and burying it in a pot let into the ground among the roots of the corpse tree, or a neighbouring tree, and covered with a flat stone. The corpse tree is a *ficus*, for which there is some consistent veneration among Nagas. The Lhota *mingethung*—head-tree—is usually the same; as also is that of the Wa in Burma;¹ while the Angamis say that a *ficus* is the priest of the trees. Again the Dusun of Borneo concur.² The Mafulu in New Guinea use a species of fig almost exactly as Yungya do for their dead, while other Papuan tribes revere the tree.³ Similarly the *Ficus religiosa* is worshipped in a tribe of the South of India by women who desire offspring,⁴ and by the Akikuyu of British East Africa in the same way, the Akikuyu definitely regarding the wild fig tree as the abode of the souls of the dead.⁵ The connection of the two ideas is obvious. Sir J. G. Frazer, in a note⁶ quotes Livingstone as saying of the *ficus*, "It is a sacred tree all over Africa and India." Apparently he might have added New Guinea and perhaps Indonesia generally as well. In a note on an Angami folk-tale, *Folk-Lore*,⁷ suggests that the Angami beliefs are borrowed from Hinduism, where the veneration for the *ficus religiosa* is well known. It seems to me more likely that all these beliefs about, and the veneration for, the wild fig, have their origin in some ancient negroid cult spread all round the Indian Ocean, which has grown up into Hinduism from below, and traces of which one would expect to find in tribes which have obviously absorbed an appreciable strain of negroid blood. The Naga tribes appear to me to have not only never been seriously under the influence of Hinduism, but to be probably entirely untouched by it, except perhaps a few who live among Manipuris in the Manipur Valley. Similarly I am disposed to suspect the survival of a definitely Negrito belief in the practice of hanging the combs of bees or wasps in the entrances of houses. On this particular tour we saw them everywhere, a huge comb in the front of a *morung* in Ukha, a Konyak village to the south-east of Yungya, being particularly noticeable. I did not succeed in getting any very definite reason for the practice, though someone said that it kept the wild cats away (they wreak havoc with the chickens in these hills), and the Semas say that it helps to make the eggs hatch, no doubt because it has already succeeded in hatching out a brood of wasps. The Thado Kukis, however (for I found some Kuki constables in my police force hanging combs in front of their quarters) state quite definitely that empty honeycombs are invaluable for warding off the onslaughts of evil spirits. One presumes that they are afraid of getting stung by the bees there might be in it, or, as Mills suggests, that they cannot find the way through, or perhaps that they have to stop and count the cells, while A. R. Brown, in *The Andaman Islanders*, gives this as an Andaman belief, the wax of the black bee—perhaps a fierce rock bee, as in the Naga Hills—being particularly efficacious in keeping off the spirits of the forest. Mr. Henry

¹ Scott and Hardiman, *Gazetteer of Upper Burma and the Shan States*, I. ii, p. 38 sq.

² Evans, *op. cit.*, p. 152.

³ Williamson, *The Mafulu*, pp. 256-263; Lyons, *Tree Reverence among Papuans*; *Man*, May 1923.

⁴ Frazer, *Folk-Lore in the Old Testament*, III, p. 316.

⁵ Frazer, *Golden Bough (The Magic Art)*, II, p. 316.

⁶ *Loc. cit.*, p. 317. ⁷ Vol. XXV. 4, p. 492 (Dec. '14).

Balfour tells me that combs are also so used in the Malay Peninsula. Anyhow, the appearance of this belief in the Andamans, which can have been little influenced by alien cultures, suggests that it is of Negrito origin.

In Yungya, as in Tangsa and Tamlu, hunting dogs are buried, like men, with houses over their graves, offerings of meat, etc. If this be neglected the surviving and subsequent dogs do not hunt well. Similarly the Thado Kukis always bury their hunting dogs with four corner-posts (*vakot*) to the grave like men.¹ The Italians crowned them.²

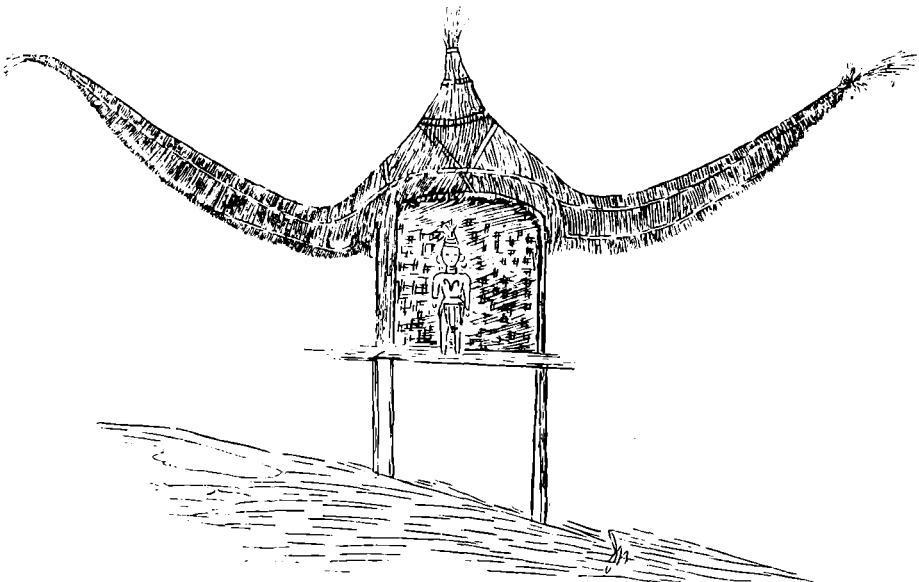
At the neighbouring village of Nyan, I noticed, a rain hat in use made like an oval shield with a headpiece in the centre of the underside as in the case of a 'mortar-board.' The type I am accustomed to in this part of the hills is the circular hat inside which the head fits. The oval shield type is used by the Angami further south, while with the tribes in between rain hats of any type are much less popular and are rarely seen.



Rain hats used by Nyan.

April 11th.—To Yàngăm *alias* Shimung, a small Konyak, or Phom and Konyak, village never before visited. It is divided from Yungya and Nyan by the Phangla stream and is on the same spur as Mongnyu, but below it.

It was while leaving Yungya that I first saw one of the enormous field-houses³ built in these parts by men who have reaped a particularly good harvest.



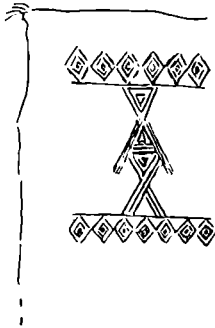
Thatched shrine for effigy of the dead at Urangkong (Phom) (Nov. 1921) Height of figure—c. 2½ to 3 ft.

¹ Cf. also *The Angami Nagas*, p. 81; Mills, *op. cit.*, p. 63.

² Frazer, *The Golden Bough*, I, 14; II, 125, 127.

³ *V. infra*, p. 11.

They are built in a form which probably represents buffalo horns, which, like mithan horns elsewhere, are everywhere here used as a fertility symbol. The houses which shelter the effigies of the dead in Urangkong are built on a similar pattern, so that one may suspect that there, as in other parts of the Naga Hills, the dead are intimately associated with the village crops. And, although a different explanation was given me in Yacham,¹ one may perhaps surmise that the horns attached to an enemy's head originate in the same fertility symbol, and may be associated with the forked wooden posts erected by so many tribes,² and the stone ones at Dimapur.³

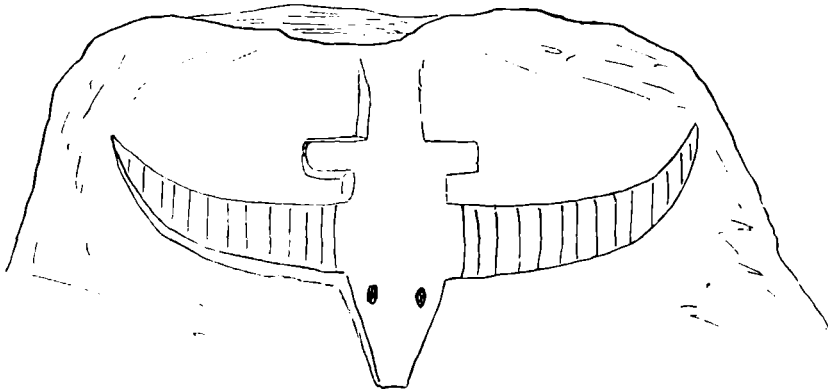


Lozenge pattern as worn on a bag. Nyan.

I noticed to-day a man of Nyan carrying an embroidered bag on which patterns were worked, which clearly associated the familiar Naga lozenge with a derivation from the human figure.

Yängām was formerly a large and powerful village, they told me, which was eventually defeated by Yungya, treacherously of course, and now pays her tribute.

April 12th.—To Mongnyu, *alias* Phom, the Survey's "Pohum" a smallish Phom village with three *morungs* and a great flair for intrigue. On the way up to the village I noticed a great ant-hill with a buffalo's head carved in earth in the side of it. They told me that it was made, when the path was cleared, in order to obtain riches in paddy. I did not ask whether the clear-



Buffalo head, carved in the side of an ant-hill at Mongnyu to bring prosperity.

ing of the village paths is here, as it is with the Angamis, associated with the cleaning of the graves of the village dead.⁴ Both the Angamis and the Semas, I

¹ *Man*, August, '22, *loc. cit.*

² Augami, Sema, Lhota, Ao, Konyak, Phom, Kalyo-Kengya, Rengma, and probably other Naga tribes, Kuki, Garo, Kachari, Wa, and many others.

³ J.R.A.I., *Carved Monoliths at Dimapur, etc.*, June, '22 (LII, p. 55).

⁴ *The Angami Nagas*, p. 198.

think, take advantage of the same festival to make a pretence at renewing occasionally the village defences, rendered useless by the *Pax Britannica*, "for fear the spirits will be angry on account of failure to keep up the ancient customs." The spirits in this particular case, I take it, are the souls of the dead whom one might naturally expect to be good conservatives and to dislike their descendants not to do as they did. The Angami village of Sekitima did the same in 1922.

When we got to the village, we found a bevy of the village beauties sitting outside the gate in wait for us. One or two had washed their faces, and showed very fair skins with a touch of pink underneath, but otherwise they were dirty, and everyone of them had betel-juice dribbling from the corners of her mouth. The status of the Phom woman in her own house and in Phom society generally may be gathered from the fact that they put up one of their own menfolk to tell us how much they would like to have children by us—and they married women and their husbands listening!

It was here that we first met with the custom which is fashionable among the women of those Konyaks which the Changs call "Chagyik" of cutting their hair as short as possible all over the head and of plucking it out entirely along two broadish triangles one on each side of the centre of the head starting from the forehead as the base (Pl. 1, figs. 4 and 5; Pl. 2, fig. 4). Before plucking out the hair they rub in ashes, which apparently makes the hair come out quite easily. This practice is not confined to the unmarried girls, as shaving the head is with the Angamis and other Naga tribes, but is permanent; "a very evil custom and a parlous," as Marco Polo would have said. In a verminous country, however, it probably has its advantages. In Mongnyu it is not universal and we noticed only a few women whose hair was dressed thus; Mills was told that they were immigrants from Saoching, further east.

The hair of boys in Mongnyu is first cut short after they have "touched meat"¹ taken on a raid. Batches of boys whose hair is then cut together are thereafter treated as adults. For this ceremonial hair-cutting the cutting block² used is made of seven sword-beans³ each stuck on a bamboo stalk, the opposite ends of which are bound together to make the handle. The hair must be cut with six taps of the beans on a dao. Mills tells me Ao boys have theirs cut with a hammer made from a little bean.



Hammer for ceremonial hair cutting in Mongnyu.

In Mongnyu outside the *moring* I noticed forked wooden posts erected, the new one being put up immediately in front of and contiguous to the old, and tied to it with ropes, while a few loughish sticks, forked or branched, were stuck into the whole group so formed.

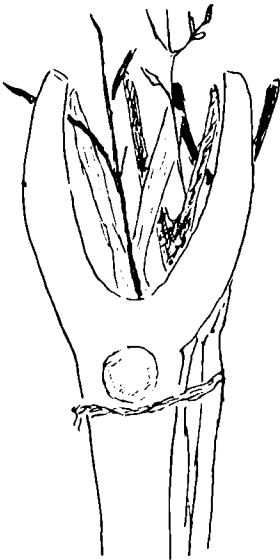
Someone described to me to-day how the Changs of Tuensang recently

¹ I.E. human flesh. Mills says that some Sängtäms, e.g. of Siriré, have to take a head before they can have their hair cut round.

² See *The Angami Nagas*, p. 22 and the illustration, p. 370.

³ *Entadu scandens*, mentioned above.

executed a woman thief by throwing her repeatedly into a pit full of tree-nettles.¹ This treatment should have a most discouraging effect on the thievishly inclined.



Forked post at Mongnyu.

April 13th.—To Pongu, "Chang" of the Survey. Like Mongnyu, it has, I believe, never before been visited. When this area was surveyed the majority, probably, of the villages mapped were located from the higher points of the ranges visited. Woodthorpe, when he did this survey, was exceedingly pressed for time, and had no one who could interpret properly; hence, no doubt, many of the rather puzzling names on the map.² Pongu is a Konyak village, probably with a strongish Phom admixture, permanently at war with Hukpang. The whole village was effusively friendly, and had a line of contiguous *chungas*³ of rice liquor lent against a low rail and stretching for about 150 yards along the path for the column to refresh it self after its climb. The village is a very stony one and with exceedingly strong defences—ladder, wall, ditch, wall, ladder, palisade, ladder again, wall and then solid wooden door. The curly-haired negroid type of head was very prevalent, and the carvings in the village more naturalistic than usual. We estimated the number of houses at about 180. Pongu dislikes the idea of

making peace with Hukpang, as that village is so notoriously treacherous that it is a great deal safer to be at war with her. Knowing what I do of Hukpang, I think the men of Pongu are wise.

Some of the rich men's field-houses here seem to be in the form of a single horn, a form also used by the Phoms (*e.g.* in Urangkong) for sheltering the effigies of their dead, as well as the double form already referred to.

I noticed here a tattoo on the upper arms of the men which was new to me. I fancy it is derived from two mithun, or buffalo, heads placed nose to nose. On the chest the regular Chang tattoo of quasi-ostrich-feather style is worn.

Stones are erected in this village; there are stone sitting-places; stone foundations to the morungs; and I noticed one regular stone platform, like the Angami *bāzè*, though rather rougher than a *bāzè* would normally be. There were also the usual forked posts carved with the inevitable buffalo head. The human head seemed to be represented in carvings with peculiarly heavy eyebrows. One

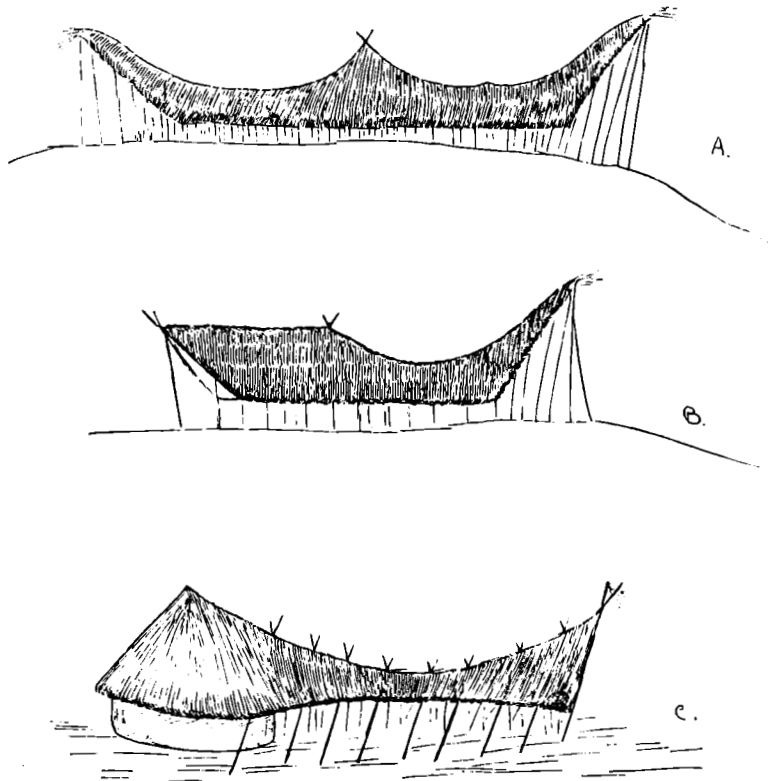
¹ Cf. *The Angami Nagas*, p. 148n. *The Semo Nagas*, p. 28. Mills, *The Lhota Nagas*, pp. 102, 180n. Stack, *The Mikis*, p. 48.

² *I.E.* the old map. The recently published topographical maps of the Survey of India were revised and added to in the light of mapping done by a surveyor with me on these tours.

³ *Chunga* = a vessel for drinking, or for carrying liquid, made by cutting a section of bamboo so that the node forms the bottom, the node at the other end being cut off, obliquely, as a rule, to make a lip.

morung, at the edge of a cliff, had two posts to the outer veranda, carved with a man and a woman respectively, which particularly took my fancy, as the figures were combined with the posts in a way I have seen nowhere else in these hills, the usual method being to carve them completely in relief and to adze away the post flat behind them.

The women have their chins tattooed like Chang women, but in addition have a trellis pattern on their breasts, and sometimes a circle with a dot in the centre of it



Field Houses at
 A. Yungya,
 B. Yongluong,
 C. Longmien.

on each cheek. The men occasionally have a face tattoo of two lines running away downwards from each corner of the mouth. The leg tattoo of the women is elaborate and elegant, but I saw no tattoo quite so effective as the simple network of the Sangtams further south (Pl. 4, fig. 5). The designs of the Pongu woman's leg may be compared to those on that of a Kalabit woman of Borneo depicted by Hose and McDougall.¹

¹ *Pagan Tribes of Borneo*, plate 142.

The great wooden dug-out "drums" in use here had a curious cone left sticking up from what one must call the floor of the drum inside it, but not reaching to the slot edge, when the drum was hollowed out. I examined the "drums" of other villages for a similar construction, but did not find it elsewhere.

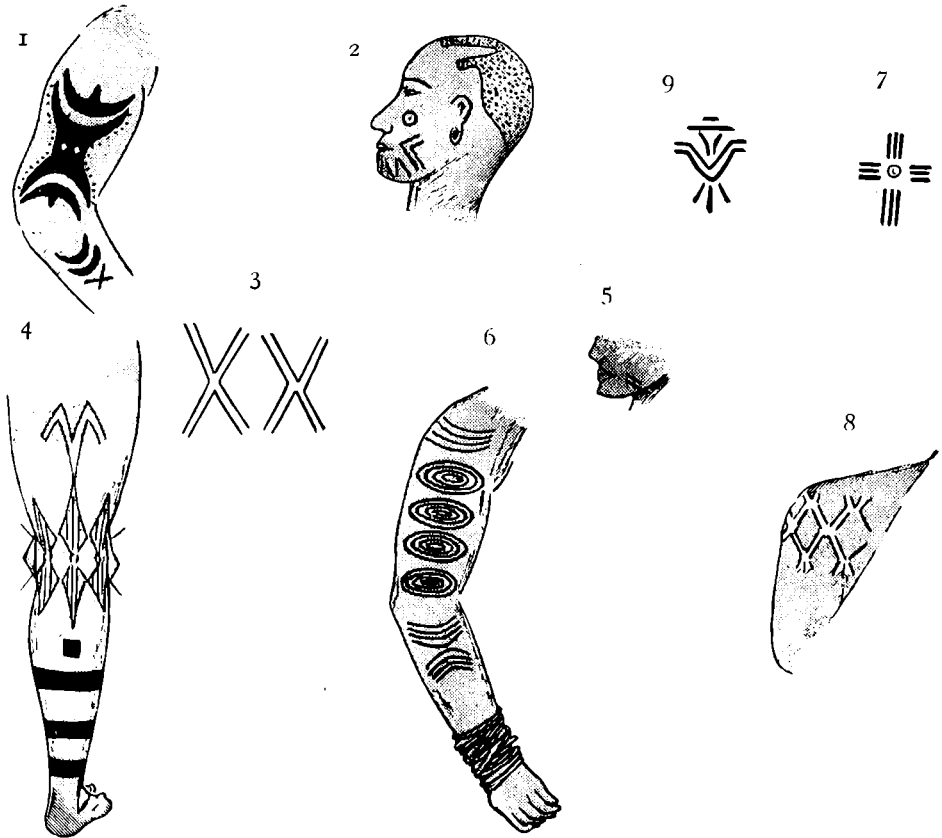
We noticed here large numbers of skull trophies in which a cow's skull took the place between the buffalo horns usually occupied by a human skull. Apparently when a man wounds an enemy but fails to get his head, he hangs up a cow's skull



Side, back and front views of figures carved on a Moring post at Pongu.

in the place of the human skull which he ought to have got but didn't. The wounded enemy is probably regarded as dying in consequence of the 'genna' done with the substitute for his head. But the question arises, Why a cow's head? A monkey's or even a bear's skull, as used by Yacham and Yungya, would seem a decidedly nearer approach to the human than a cow's. The Naga is not a pastoral race and does not drink milk, nor has he been appreciably touched by Hinduism, yet in some respects the cow is treated with respect. Sharing as it does its owner's

roof, it is the only animal besides the dog to which the Angami gives an individual name; the Aos include a clan which, nominally at any rate, tabu the flesh of the cow entirely, though everyone else eats it; when we come to the mithun, we find that both by Aos and Changs, if not by other tribes as well, the mithun of men is



The continuation of the pattern round the knee has been shown outside the outline of the leg.

Tattoos—

1. Pongu ♂ arm.
2. do. ♀ face.
3. do. breast.
4. do. leg.
5. do. ♂ face.
6. Angfang ♂ arm.
7. Chingtang ♀ navel.
8. do. shoulder.
9. do. below throat.

associated with the sky spirits, while the souls of men are conversely bound up with the mithun of the sky, so that when a mithun dies on earth a spirit dies in the sky, and when a man dies, it means that the sky spirits have sacrificed a mithun. I do not know that the beliefs as to mithun are in any way relevant, but, in the case of the cow, it seems possible again that one is in touch with some pre-Hindu belief

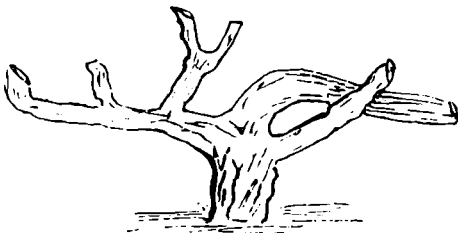
that has been incorporated elsewhere into that so receptive system. So too there is an Angami custom which always suggests to me that I am witnessing the primitive practice in which the Hindu use of caste marks on the forehead arose. The seat of the Angami soul is in the forehead.¹ To keep off evil spirits the young, who are more susceptible to such harm than the adult, lick and stick on to the centre of the forehead a bit of the leaf of some aromatic plant, usually wormwood, a spiritual disinfectant of great efficacy, which gives the exact effect of a caste mark. This is no new practice, as I have heard suggested, but has a very definite and concrete purpose and must go far behind the days when Manipuris with white paint on their foreheads could be met in Kohima bazar.

April 14th.—Through Yungphong to Yanching. These two villages were recorded as "Chamba" and "Yangtung" by Woodthorpe in 1876, he coming from Hukpang ("Siphang") across the Piyongkung Mountain.² This time the situation was delicate, as we had Pongu men carrying our loads for us, and Pongu was at war with Yanching. The Pongu men all wore bits of sword-grass or some other sharp grass about their persons "as this is the custom when going to an enemy village." They said at first that nothing would induce them to carry past Yungphong, but eventually we got them to go on past Yanching to the river, the Yangmun or Yangnyu, beside which we camped. I swam across the river, while bathing, and found a huge concourse of strange Nagas on the far bank, but quite friendly, as one of the headmen from our side kept them from coming too close by throwing stones at them. On the part of both the villages on the near bank and of those on the far, there seemed to be the greatest reluctance to crossing the river, a sort of local Rubicon. However, some men from Jakphong, Yaktu and Ukha, which the Changs call "Aukhu," eventually came across to profess their friendliness.

In Pongu, Yungphong and Yanching there is a practice, new to me, of penning up the village pigs in pens under the platform at the back of each *morung* which is used as a latrine, the pigs serving for sewers. Individual householders hand over their pigs to be fattened thus by the young men of the *morung*, and pay them for the services so rendered.

Yungphong, like Pongu, has very strong defences, a double rampart of earth and stone with perpendicular sides, a "panji"-ditch in between crossed by two bamboos for a footway with a cane slung alongside as a handrail, then palisades, ladders and a wooden door.

In addition to this the paths to the village were all blocked with branched stumps,



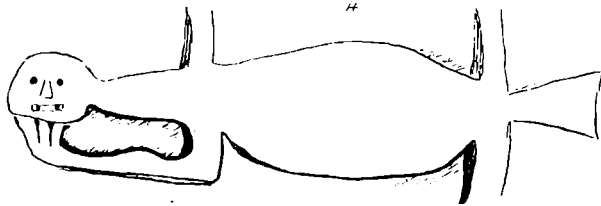
Branched stump, used to block paths round village.

¹ Cf. *The Angami Nagas*, pp. 98, 183.

² *Report of the Survey Operations in the Naga Hills, 1875-76*, by Lt. R. G. Woodthorpe, R.E., Assistant Superintendent, No. 6, *Topographical Survey*. This valuable report was printed, but the Assam Secretariat in Shillong has only one copy and does not know of any others. I possess a second copy, given me by the late Mr. J. B. Woodthorpe, General Woodthorpe's brother.

sometimes with rows of them, which would entirely prevent anyone from running down the paths. Woodthorpe¹ records the same at Tōbū, and Butler² mentions it as an Angāmi practice.

In front of the houses rows of forked posts form a low wall to the porch front, and the gables carry "house-horns." The forked posts, at any rate, were probably significant of the performance of some such ceremony as the



Grotesque on a beam at Yungphong.

Lisū of the Angamis.³ A buffalo head carved in one of the Yungphong *morungs* was of a rather new type, and confirmed the derivation given for the tattoo on the upper arm noted at Pongo.

The belts worn in these villages give a definite connection between the long strip of cane, which a Konyak so often coils round his waist, and the broad band of cloth, stiffened to a shining white solidity with filed and fitted cowrie shells, which the Chang affects. The Yungphong belts consisted, some of them, of short lengths of cane split and joined at the ends one above the other so as to give a belt about six canes broad instead of the continuous coil. In some cases these simple horizontal canes were combined with vertical strips in a regular weave, naturally leading to the substitution of cloth. In other cases a simple belt of broad stiff bark (in one case I saw hide) was used, about six inches broad, which must give precisely the effect to the wearer that is given by the broad cowrie-stiffened belt of the Changs.

At Yungphong we noticed a round water-worn stone hanging up in cane harness under the eaves of the *morung*. The explanation given was that some Yungphong man "chopped" a man of Jakphong and took his head, and, in order that the bloodguiltiness might rest on Jakphong's own head instead of Yungphong's a stone from Jakphong's land was brought away and hung in Yungphong. It is difficult to see what good that can do, unless the miserable ghost is deceived by the presence of a stone from his own land into thinking that the village is his own village, and her enemies his enemies. Outside Yungphong was one of the large white screens of split bamboo that signify the death of a great or rich man. White screens of one sort or another all over the Naga Hills have this significance, and that attributed by Shakchi to such a screen on the opposite

¹ *Loc. cit.*

² *V, The Angami Nagas*, p. 45, quoting Capt. Butler in *J.A.S.B.* I, vi, of 1875.

³ *J.R.A.I.*, *loc. cit.*

hill outside Ukha, *viz.*, a desire to gloat over having taken a Shakchi head, was denied by the men of Ukha, who stated, truly I think, that it had the same significance as that at Yungphong. It is not impossible that the Shakchi villagers in making the statement they did, hoped that we should disapprove, or perhaps wished merely to convince us that it was Ukha who were doing the head-taking, not themselves. On the other hand Woodthorpe in 1876 remarked¹ that they were always put up facing a village with which the erecting village was at war, as in this case, but if the village is at war, there are likely to be deaths among its inhabitants. Could it be to indicate to a dead and decapitated warrior, whose soul has presumably gone with his head to the enemy village, the proper way back to his own? The Angamis of Viswema, who put up white and black cloths in a very conspicuous way, stretched on a scaffolding and looking like a sail (Pl. I, fig. 8), when any proper man dies, told me that they put them up "so that the dead man might see them," but I could not get more from them than that. Woodthorpe's description of the white screens he saw in 1876 is as follows:

"It looks at a distance like a large silver chevron turned upside down. It is made of split pieces of wood with the white face turned outwards, placed close together vertically and fastened to huge curves of cane or bamboo, suspended between three trees; the whole length varies from 40 to 50 feet, and the average width is about 6 feet, widening to 12 feet at the centre point."

Here, however, it struck me that these screens were merely another instance of the buffalo-horn symbol, and possibly a means of the soul's communicating its fertility 'mana' to the village or the village land. But I confess that the form *might* be likened to the representation of a gigantic bird, and some further erections described by him as seen at the Chang village of Yangpi gave him that impression. These were

"large pieces of wood, cut, and the white face turned outwards, and joined, so as to resemble a bird with outstretched wings, and placed in the branches of several of the trees of the village, and have the appearance at a little distance of huge white birds beginning to take flight."

Whatever the intention of these erections put up by various tribes they all have the effect of catching the eye at a great distance, and letting one know that the village has lost some stout fellow by death.²

¹ *Loc. cit.*

² I have since seen one just as described by Woodthorpe in the first extract given above. It represented a rainbow and was put up as part of the memorial of a chief who died at Chingmei. Possibly the rainbow is for the spirit to go to the next world by. The Semas call the rainbow *Kiangami pukhu* meaning "the sky spirits, bridge." In Greece the rainbow was Iris the messenger of the gods to mortals, while in Teutonic mythology again the rainbow is the bridge into heaven used by the gods (Stallybrass, *Grimm's Teutonic Mythology*, 731 sq.) and by the dead (*ibid.* 733). I am indebted to Mr. Henry Balfour for the reference to Stallybrass. The rainbow is regarded as a path for disease by the Sakai-Jakun of Pahang, who, if they see a rainbow when on a journey, stop and build a hut, and by the Andamanese as the "road used by angels" (Man, *J.R.A.S.*, XII, 338) or by spirits visiting their friends on earth (Brown, *Andaman Islanders*). It is probably with

In Yanching I noticed again that the curly-haired negroid type was common, though I never yet in any village met the equal in this respect of a Sangtam or a Sema, I do not know which, from the village of Shiets, who had curly black hair lying close to his skull like an African. He must have been the butt of his fellow-villagers, for curly hair is regarded by Semas, as by most other Nagas, as peculiarly offensive and a matter for much ridicule, and is rare in most tribes.

I noticed at Yanching the use of both the thong and the quartz and iron method of producing fire.

The Yanching 'lengtas' do not, like the Chang and Sangtam ones, have a bag to contain the testicles, but constitute a compromise between that and the simple Konyak 'lengta' which merely depends from the waist. The Yanching 'lengta' is attached directly to the testicles by a cord. A man of Noklang came in wearing an interesting red cane pointed cane headband intermediate in shape between the red cane hat of the Chang and the pointed white headband of the Northern Konyaks.

April 15th.—Halted by the Yangmun River. The villages of Angfang and Yonghong sent in representatives with presents and professions of good will, as also Ükha, Noklang, Jakphong and others, but all were very reluctant to cross to our side of the river. Ükha wanted to know if they should "clear the camping ground which the sahibs used the last time they came," i.e. forty-eight years before, the only previous visit ever! Another typical instance of the length of village memories in the less sophisticated parts of the hills was afforded by the village of Angfang, who mentioned that they had given Woodthorpe two goats, a pig, ten fowls and twenty eggs, which may probably be taken as correct to within an egg or two. The men of Jakphong were accustomed to water, and though I did not see anyone swim, I saw them disappear under water for some time, and they must have been either swimming under water or crawling about on the bottom. Woodthorpe noted having seen Lhotas cross the Diyang below Sanis by crawling under water on the bed of the river with stones tucked in their belts.

All these villages across the Yangmun seem to know Ahon, our Konyak interpreter from Shiong to the North, though apparently he has only once in his life been this way, and that to get heads. Possibly his name has been heard of, and his tattoo is recognized as that of Chi, of which Shiong is an offshoot. Chi has much influence here, and apparently receives or used to receive tribute.

The presentation eggs brought for us by the Jakphong representatives were, for a change, neither addled nor bad. They hatched of themselves in the kitchen that evening, and without the aid of any wasps' nest.

the same sort of idea that the Angami, Sema, Lhota and Ao Nagas will not point at the rainbow for fear their fingers would shrivel, a belief found in Germany (Brunswick) and in China (Stallybrass, op. cit., II, 731 sq.), among the Karens (Marshall, op. cit., p. 228), in Borneo (Evans, Religion, Folklore and Custom in N. Borneo and the Malay, p. 15) and in Lifua in Melanesia (Hadfield, Among the Natives of the Loyalty Group, p. 113).

¹ A species of loin cloth usually in the form of a narrow apron hanging down from the belt in front of it, and passing also underneath it and down between the legs, and ultimately attached by most tribes, not by all, to the back of the belt by a cord.

April 16th.—To Ükha, a steepish climb of about five to six miles after crossing the river. The people here were very shy. They gave us presents of rice and goats and rice-liquor, but were obviously afraid of our intentions, no doubt on account of what happened last time, when they tried to ambush Woodthorpe's escort, and succeeded in wounding a sepoy and getting their village burnt. Probably they credit us with memories no less long than their own and the vindictiveness any Naga would display in our position. Many of the carved posts of the *morungs* were taken down and put outside, to save them, as we supposed, in case of the village being burnt, and when I turned my camera on a crowded morung built in three tiers (Pl. 1, fig. 1), all the occupants fled, taking it for some sort of deadly weapon, and could not be induced to return. Yet they cannot ever have seen or heard of a machine gun. If one looked at them they got up and went away. They had a few old heads in the *morungs*—the new ones probably hidden—and one *morung* had a fairly recent hand fastened up in it.

At Ükha, as at Pongu, the young trees are very carefully preserved and kept growing in the crop, and the surface soil is kept from detrition by a very free and systematic use of logs to keep up the earth in rudimentary terraces of a more efficient kind than I have seen between here and the Angami country. The drink they gave us here struck me as extraordinarily like the Kuki *vai-ju*, and, sure enough, I found on enquiry that it was brewed from paddy husks as by the Thados.

All round these parts there is a general reluctance to part with any article of personal use or adornment, for fear, apparently, that the soul of the original owner will fall into the power of the purchaser, which rather looks as though articles once worn became permeated with the owner's vital essence.

This sentiment seems a great deal stronger when it is known that a *sahib* is the purchaser as distinct from a strange Naga.

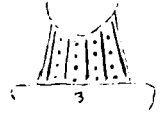
Apparently our 'mana' is regarded as being dangerous in itself, apart from any volition on our part. So, in many villages, nothing we had used, not even the bamboo mats we had borrowed for screens, could be touched again by their owners or by anyone else after we had gone.

I noticed outside Ükha a few small stones erected, and others lying flat, probably having been originally so placed.

A Phom, of Phomching, apprised me of a belief that I had not struck before, by asking me to exchange a dao of mine for the fine dao which he was carrying. It was Kangshi, and he said that a dao used to decapitate an enemy either turned harder than before or it turned soft in the hands of the beheader, and his had turned soft on him. It was the dao used to take the Yacham head already referred to. Eventually he exchanged it for a decidedly inferior dao belonging to someone else.

The Ükha men had, some of them, the "ostrich-feather" Chang tattoo on the thigh, while the women had the same patterns as those of Pongu. Some of the men also had their throats tattooed with a vertical line pattern suggesting a stiff and high necklace with bone supports like those of some Konyaks. This pattern was

seen at its best on the effigies of the dead, which we here met for the first time on this tour. These figures are made of wood and collected, apparently in family groups, under open thatch shelters outside the village (Pl. I. fig. 2). They are definitely stated to be provided for the habitation of the soul of the deceased whom they represent. The body is disposed of in a wrapping, of the same 'tonko-pat' leaf (*livistona jenkinsiana*) as is used for thatch, and slung on four stakes about five feet above the ground outside the village.¹ Seemingly the head is ultimately detached, for the skull is placed on the top of the effigy in order that the soul may pass thence into the wooden figure, after which the skull must be again removed, for we did not see any actually *in situ*, though one or two of the more recent figures had leaves, etc., still left on the top of them which had



Tattoo showing on the neck of a warrior effigy at Yaktu.

apparently been arranged to let the skull sit softly on the wood between the two wooden horn-like projections which rise from each side of the flat-topped head and curve over above the site for the skull, and doubtless serve to prevent its being displaced while left on the effigy. In one case the effigy was wearing a cane hat on the top of the two ends of these horns. All the effigies I saw at Ükha were made from a single piece of wood, but one, which had the right arm bent at the elbow and pegged on to the body at the shoulder. The eyes were made of a shiny round black seed, probably that of *sapindus detergens*, which I have seen elsewhere used as a bead. In some cases the dead (apparently the less important dead) were represented merely by a piece of conical basket-work resting on its base and being topped with a sort of deep basket work tray, the unfastened ends of the bamboo material curving over the top, to protect the skull.



Profile of 1.



Effigy of the dead at Ükha.

The wooden figures put up as the memorials of the dead by the Angami (*v. The Angami Nagas*, pp. 47, 227) seem to be likewise for the accommodation of the soul. Some villages leave them till they rot away; others (e.g. Kohima) remove them after they have been up a year "as it is not good to let them remain too long." Wooden effigies are used as abodes for the soul in the Pacific.²

¹ So, too, the Shans—Hose and McDougall, *Pagan Tribes of Borneo*, II, p. 240 quoting Colquhoun, "Among the Shans." Also Butler, *Sketch of Assam*, p. 163.

² (Frazer, *The Belief in Immortality*, II, 288, 297, 318 sqq., 104), and apparently the skulls are sometimes kept inside

To our camp at Ükha, Yonghong and Yaktu men came in, and also the Chang chief Chingmäk of Chingmei, an old acquaintance, who brought with him one of the Töbū chiefs. From the former we learned that Chingmei, which is apparently on the watershed dividing the sources of the Tsüta ("Tita") and the Zungki from another stream which runs directly east to the Chindwin, is in touch with the plains of Burma, more or less, and its traders meet with people on the Burma side who wear trousers. Mills picked up a Khämti dao here, and the metal armlets they wear hereabouts are said to be got from a place called Kāmlügh, which I take to be Khämtilong. Chingmak told us that Môm, a big village on the next range, renowned like Töbū for its daos, had told him to bring us a challenge from them, as they thought it a pity we should have come so far and go away without leaving them any of our heads. On Chingmak's representing to them the futility of trying to take on a



Basket work
skull-efigy
at Ükha.

force of our description, and saying that as many more servants of Government were always to be had to replace the killed in inexhaustible supply, they thought better of it, and resolved to bring presents instead. They changed their minds again, however, and never came officially, though they had a spy hanging about our camp for a day or two.

At Tobu, also known as Tijing, there is said to be a high stone sitting-place reserved for the hereditary chief, and held during the minority of the present very old and autocratic chief by his mother, a thing most unusual in these hills. Woodthorpe¹ mentions "a very fine stone viaduct in the middle of the village about 50 feet in length and 20 feet in height, with a most scientific culvert through it." I hope to get to Tobu in November.

Shamnyu, a village across the valley of the Kaimong north-east of Tobu, is said to have been burned by Burmese troops on their way to invade the Assam Valley, presumably in 1816, and Mills tells me that a similar legend attaches to Ungma, Nankam and the villages on the Langbangkong in the Ao country. This is confirmed by Woodthorpe's diary of 1876 which records that the villages on the Langbangkong range have two names because they received a new one after being burnt, of which Tsimr-Menden or Longmisa is mentioned as one. It seems, however, that another and much more likely explanation is also given of these alternative names—that when the Ahom Kings succeeded in exacting tribute from certain villages they gave them names of their own. This, however, though accounting for the obviously Assamese names such as "Naogaon" for Merangkong, will not account for all of them, e.g. Longmisa, and it is possible that the Burmese invasion had been confused in

them or at least with them (Frazer, *id.* I, 311 and II, 324). Elsewhere effigies are set up as memorials only, it seems (Codrington, *The Melanesians*, p. 174). A wooden image for the soul of the deceased seems also to be made by the Kafirs of Kafirstan (*J.R.A.S.*, XXVII, 78). For the head or skull as the location of the soul cf. *The Angami Nagas*, p. 198; Frazer, *id.*, II, 325, Codrington, *ibid.*, 264.

¹ *Loc. cit.*

tradition with a previous interruption of invaders from the east when the invaders did not go on to the Valley, but stayed in the villages they conquered and in some cases changed the names of them, possibly driving out the former occupants who would naturally continue to use the old names, and speak of the villages by them to their neighbours in the plains.

As among the Aos, the successful head-hunter in Ükha hangs up a circle of cane in front of his house.

To-night was the first fine night since leaving the railway. Another presentation egg hatched on us here.

April 17th.—*Viä* Yaktu ('Yakchu' according to the Survey and to some of the neighbouring villages) to Yonghong ('Yanghum' of the Survey).

Yaktu, on the day we passed, gave Ükha two months' notice of hostilities. The *casus belli* was that when the young men of Ükha went to loot a Yaktu 'mithun' (they probably called it "realizing a debt") and the Yaktu bucks turned out to chase them off, one of the latter got stuck on one of his own village 'panjis.' War between these two villages seems to be normally of a friendly description. Women are not killed and due notice of war is given before raiding starts. Both villages had plenty of heads hanging up, but many of the Ükha ones came from Shakchi. There seems to be a state of permanent war between this range and those further west, and the languages spoken are different, though both groups must be classed as Konyak, I think.

In Yaktu I saw a weapon new to me which consisted in a dart made, in this case, of a broken spear-shaft of sago palm and feathered like an arrow with pandanus leaf but intended to be thrown by hand (Pl. 2, fig. 2). The feathers were lozenge shaped like those of the usual cross-bow quarrel.¹ The Semas tell me that their children use a toy of this pattern. The point of these Yaktu-Yonghong darts is only cut sharp, and though it could no doubt inflict a wound, it does not strike one as a very formidable weapon. Mr. Henry Balfour tells me that the feathered javelin is a very uncommon type of weapon.²

The women on this range, as at Pongu, Yungphong and Yanching, all wear a very narrow petticoat some five inches deep, and above it a belt, or a series of belts, each consisting of a number of separate threads made up into a bound loop at each end and fastened in front



"Chägnyik" Konyak woman showing coiffure and tattoo and belt of gummed cotton strings.

¹ See *The Sema Nagas*, pp. 23, 24.

² I see that Adonis in the Titian discovered in 1923 in the National Gallery carries a feathered spear of the same pattern as the arrows in his quiver; the 'king of Kochin' is represented in an ancient print as riding on an elephant with a feathered spear in his hand (Iyer, *Cochin Tribes and Castes*, II, 5), and Keate mentions as used in the Pelew Islands darts five to eight feet long pointed with wood and "bearded" (*Pelew Islands*, p. 89 [1789]).

(Pl. I, fig. 5; Pl. 2, fig. 4). Woodthorpe describes it as "a small belt of very fine leather thongs," and this is what it looks like. I took it for leather myself, until I handled



Wooden menhir in Yaktu

one. The twisted threads are covered over with some sort of gum or wax, making them black and shiny like well-worn hide. The women all do their hair, or rather their head, for they leave little enough hair on it, in the manner described of those at Pongu who shave and pluck, but they are otherwise pleasant looking and less negroid than the Phoms. I noticed forked posts, big flat sitting stones, and a collection of water-worn stones, like the Sema *aghucho*,¹ of various queer shapes. On the houses the carved planks were particularly noticeable, the patterns being mostly highly conventional mithun heads and lizards, coloured, in some cases, with black, brown, yellow or white pigment, but in much lower relief than the Angami carv-

ing. I also saw a wooden slab carved with a buffalo head set up as stone menhirs are.

Again here we saw round stones, some of them with little tassels on each side, like enemy heads hanging up in the *morungs* where the heads are hung, and were given a more detailed account of their use. We were told that they were taken at a peace-making from the enemy's land, the other side taking them from their land. Other Konyaks, e.g. Chi, set up a stone in the ground on the spot at the time of making a treaty of peace,² and if either party break the treaty, the injured side goes to the stone and tells it about the breach and justifies its conduct to the stone before it starts raiding again. Apparently these witness stones hung up in the Yaktu *morungs* serve the same purpose.³ It must be very much more convenient to expound your case before the impartial stone at leisure and at length in your own *morung*, than to have to go to the edge of the enemy country, risking both your life and the disclosure of your hostile intentions, before you can retaliate for the breach of good faith which he has committed, or which you are pleased to impute to him with enough plausibility to convince the stone of the justice of your cause.

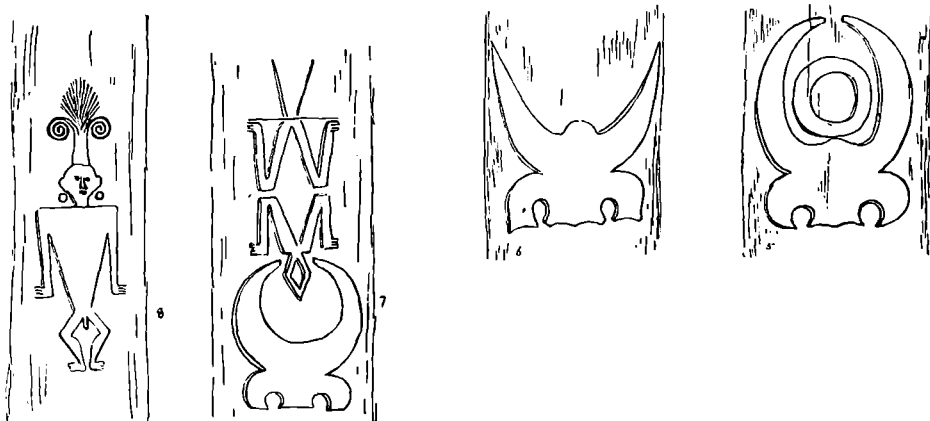
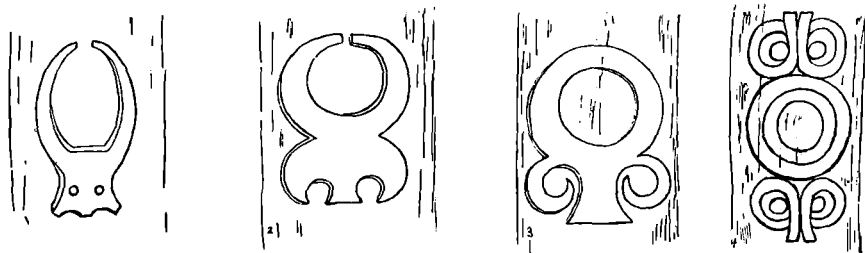
Yonghong is one of the most interesting Naga villages I have seen, as well as the biggest I have ever been in. There are really two villages, which, though only just separated, are marked as different villages on the map.

¹ V, *The Sema Nagas*, p. 174 sq.

² So too the Khasis, v. Hooker, *Himalayan Journals*, cl, xxix.

³ Cf. Frazer, *Folk-Lore in the Old Testament*, II, 403 sqq.

But even omitting the smaller of the two, the main village is enormous. All these people are Konyaks of some sort, and a certain resemblance between the Konyaks and the Angamis, not shared by other tribes so much, had struck me long before this, but the inhabitants of Yonghong go much further than any Konyaks I have seen before towards identity with the Angami, or perhaps rather with the Nzemi division of the Kacha Nagas, who have clearly been



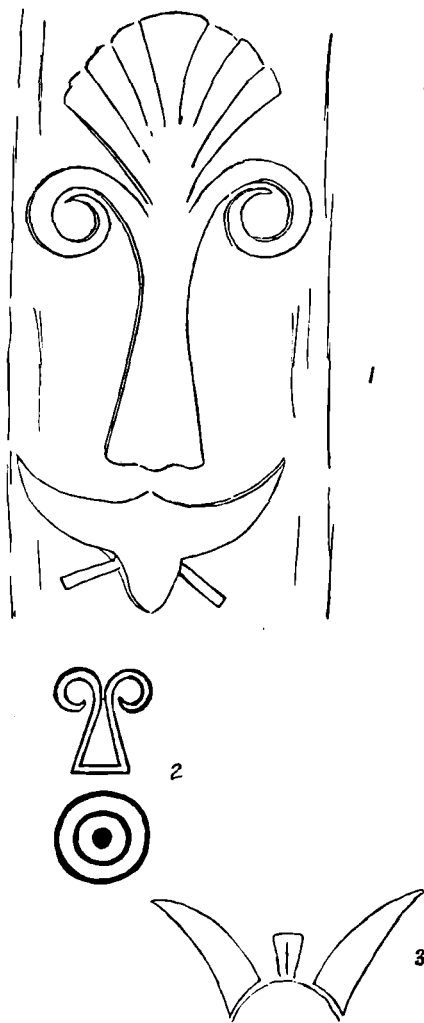
1. Mithun head as carved in Yungphong.
2. do. Yaktu.
3. 4. 5. and 6. do. Yonghong.
7. Lizard and mithun head carved in Yonghong.
8. Human figure carved in Gwilong.

very much influenced by, and have probably had a very great deal of reciprocal influence upon, the Angami of Khonoma.¹ Yonghong has stone sitting-places, menhirs, though the erection of these seems to be beginning to go out of fashion, and a very superior method of jhuming among pollarded alders, all very reminiscent of the Nzemi and the Khonoma group of Angami, who adjoin the Nzemi. So too the wooden images of the dead, the carved planks of the

¹ A village to the S.W. of Kohima.

houses and the physical appearance of the men all recalled the opposite (south western) end of the hills. The women at first look very different owing to their plucked crowns, but I fancy that differently dressed they would fall into line.

It was in Yaktu or Yonghong that Mills pointed out the obvious relation between the "ostrich feather" tattoo pattern of the Changs¹ and the conventional representation of a buffalo's head, the horns having disappeared in the tattoo pattern or run over on to the shoulders perhaps, leaving the curled ears and a prolonged nose (Pl. 2, fig. 8). The same development of the ear at the expense of the horn probably accounts for the similar pattern so popular in the Nzemi carvings in Kenoma, Chekwema and Gwilong; though in one instance I noticed in Gwilong that mithun horns, an equally popular adornment for the head of warriors carved on gates or houses, had their points turned down instead of up, making them look like the wings of a mediæval jester's cap. It is to be noticed also that the Nzemi representation of a warrior (Pl. 2, fig. 9) depicts him as naked and with rings round his very narrow waist. These rings, though they appear to have become now confused with the white cowrie lines in the Angami kilt, which the Nzemi have adopted, must originally, I think, have been the Konyak cane belt, as they do not hide the private parts, which are left bare in the carvings even when the rings of the kilt are brought down the legs (Pl. 2, fig. 3). Mr. Crace of Haflong told me that some of the Nruongmai (Kacha Naga) villages in the North



Patterns of Nzemi Carvings.
1 and 2. Patterns on houses at Gwilong (Togwema).
3. Pattern at Chekwema (Yangkhulen).

Cachar Hills claimed to have had their village lands granted to them by a Naga King who wore a cane belt, and whose people went naked, which, as they cannot have conceivably got their land from the chief of any existing Konyak

¹ *V. infra*, p. 51 for drawing.

village, suggest that nakedness and cane belts were formerly the rule where they have now disappeared. Indeed, the Angamis speak of a time when their women-folk wore petticoats no broader than a man's hand, like the Konyak women of today, but do not know, apparently, of any time when their men went naked. As for the cane-belted King, he is, I believe, supposed to have reigned at Dimapur, and it is worth note that Tularām Senapati, the pretender to the throne of Kachar on the extinction of the regular Kachari line, claimed to be the representative of a pre-Kachari dynasty.¹ To return to the Nzemi, I may note that I found in Gwilong, which is probably half Nzemi, half Marami or Khoirao, the scissor snare used by the Konyaks:² and as far as I know by no one in between, while the Nzemi stone-work is as fine as any in the hills as far as menhirs, dolmens and stone sitting-places are concerned, and their menhirs and sitting-places are often associated with tanks excavated to hold water alongside them. The "Stone-henge" at Togwema (Gwilong) is, of course, well known from Hodson's account of it.³

In Yonghong I noticed a row of dolmens below the village and more in the village itself (Pl. 3, fig. 2). Two big menhirs I found overturned in jungle. They seemed to have stood one on each side of a small ditch or stream. Two other big ones were still standing outside the smaller village, one long and narrow, the other squat and thick, but both big and clearly very old (Pl. 2, fig. 7). Inside the village I saw a wooden sled of precisely the Angami pattern,⁴ with five holes for crosspieces. It had apparently been used for dragging in a large flat stone which was located close by. The erection of monoliths seems to be on the downward grade here, as in many Angami villages, where no one any longer troubles to put up a stone of any size. In Khonoma, however, where it still goes strong, they say that the essential thing to do was to build a *bāzē* or a *kwēhū*, i. e., a rectangular or a circular stone structure with a flat top and stones arranged round the edge to sit on, and either actually containing a grave or graves or else erected to the memory of a dead man. These tombs and cenotaphs, they tell me, are much less attractive to the present generation of Khonoma than menhirs, and nowadays most people prefer to



5
Wooden figure set up with 'genna' stone at Yonghong.

¹ Butler, *Travels and Adventures in Assam*, p. 19; Gait, *History of Assam*, p. 300.

² V, *Man*, Dec. 1922. Khonoma also use it, but state definitely that it is in their case a very recent trade importation from the Jushai hills.

³ *Naga Tribes of Manipur*, pp. 186, 187. Unfortunately the plan of the Gwilong stones given by Hodson bears no relation at all to the actual facts. It was not made by Col. Hodson himself. In June, 1923, Mr. L. O. Clark, Political Agent in Manipur, Mr. C. G. Crawford, President of the Manipur State Durbar, and myself visited Gwilong and tried in vain to make the plan at p. 187 of Hodson's book tally with any part of the "Stone-henge," which though it contains at least 155 stones is confined into an exceedingly small space. Nor did the measurements taken by Mr. Crawford correspond to Babu Nithor Nath Banerjee's list given in Hodson's book.

⁴ V, *J.R.A.L.*, LII, plates xv and xvi. (December, 1922.)

put up a menhir or a row of menhirs instead. In Yonghong I saw no new menhirs of any size. Outside one *morung* was a large collection of small erect stones crowded together, to which more are added at periodic festivals. In front of the heap was a curious little wooden figure with the Chang tattoo on his chest and a head running up to a high conical point ending in a plume of leaves and grass.

I noticed here a face tattoo which I have occasionally seen before in Phom villages, probably on runaways from further east, and which is, I believe, worn in Tobu. In the form I saw here it is a line running from the forehead down the nose, at the tip of which it broadens out, with three dots on each side. Tobu, I think, wear it the other way up and extend it to the chin as well (Pl. 3, fig. 5).

Yonghong had some very realistic buffalo-headed drum-logs in private houses.

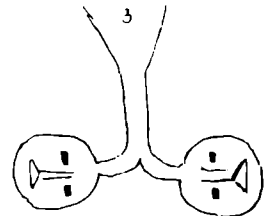
Most rich men here seem to have their own drum-logs. One wonders whether the metal gongs so beloved of Kukis and other tribes, and always a mark of wealth or importance, have merely replaced wooden and less portable antecessors.

The *morung* carvings here ran to monstrosities—tigers with elephant-tusks (Pl. 2, fig. 1), tigers with buffalo-horns, and in one case a two-headed tiger. The carvings on the houses were as at Yaktu, but often spotted with black on a sort of ochre-coloured ground. The *morungs* contained large numbers of heads, mostly taken from Angfang across the valley, and the granaries had one of the most ingenious devices for defeating rats that I have seen. The bamboo posts on which the granaries were raised from



Monstrous heads of figures carved on Morung post at Yonghong.

the ground had bamboo spathes bound point downwards round them with the slippery surface of the spathes towards the post. All round the foot of the post little vertical 'panjis' are put in, so that the rat, on climbing up to the spathes, and being unable to get any farther, drops off the post and is impaled on the 'panjis' at the bottom. Another way of catching rats was pointed out to Mills. Logs laid in the crop at the time of sowing, the ground on each side being 'panjied,' are taken up when the rice is about a foot high, leaving a smooth run where the log lay, ideal for rats. In this run traps are set with great effect.



Monstrous heads of figures carved on Morung post at Yonghong.

The village organization of Yonghong is very Angami-like in its non-existence. There is no one who can give an order which has any serious chance of being obeyed, or who has any appreciable control over any one else. This gave us a good deal of trouble, as we could get nothing done without interminable delay and exhausting

ourselves with horrid threats. They had made up their minds that we had better camp beyond the village, in the valley where Woodthorpe had camped, and they had cleared a path round the outskirts of the village so that we should not pass through it, and tried hard to push us on to the Muksha river, but as we wanted to see the village, and had to get carriers out of it next morning, we disobligingly camped alongside it.

Height 5,700 ft., and cold enough as well as wet.

April 18th.—Yonghong to Angfang across the valley of the Muksha; a rather ticklish march, as the two villages are very much at war, and neither could carry on the land of the other, and each had the greatest reluctance to meeting the men of the other village to exchange loads. The Angfang heralds, who are sacrosanct in Yonghong, had come in to our camp there, and as a matter of fact made an arrangement with the men of Yonghong that the latter should put down their loads at the stream, and that then the Angfang men would come down and fetch them when those of Yonghong had withdrawn, but neither party told us anything about it. Consequently, with great difficulty, we got the Yonghong men to carry our loads half way up the far hill with the Angfang people sheering off as we got higher. Eventually we let the former put down their loads and hurry off, after which the Angfang men came down and took them up.

As the Yonghong men turned and went off homewards, each man threw away the stick he was carrying. This was on Angfang land. I could not make out from anyone what the significance of the act was, if indeed it had any.

Angfang is a less interesting village than Yonghong, but the men are of finer physique and possibly still more reminiscent of the Angami in appearance. They went up the path with our loads singing "*Yonghong shāt'nyū*," "*Piyongkung shāt'nyū*," i.e. "(We are) the tigers for Yonghong," "(We are) the tigers for the (villages on the) Piyongkung." As they had hidden all their heads, however, I could not compare their trophies with those of Yonghong.

The dialect spoken seems to be virtually identical with that spoken in the administered Konyak villages, and Angfang is on friendly terms with Chi and other villages on our borders.

I noticed here that as at Yaktu and Yonghong the forge was in the *morung*. This is in direct contrast to, at any rate the custom of the Lhotas and, I think, of the Angamis, with whom a forge usually, if not always, has a building to itself. In fact I do not remember seeing it otherwise in any Naga tribe before.

The drum-logs here were tusked instead of carved into buffaloes' heads,¹ and the effigies of the dead, who mostly had their arms fixed on instead of cut out in a piece with the body, had straight skull-horns instead of curved. Those of males had on the head an ornament of some sort, probably representing the brass edition of the buffalo-horn

¹ (Mills tell me that the drum-log at Yelimi, one of the three or four Sema villages that have borrowed this instrument from the Saugtains or the Aos, gets the same effect by having a second buffalo head in the reversed position rising out of the usual one; the latter has horns lying back on the log, while those of the second head project in the opposite direction.)

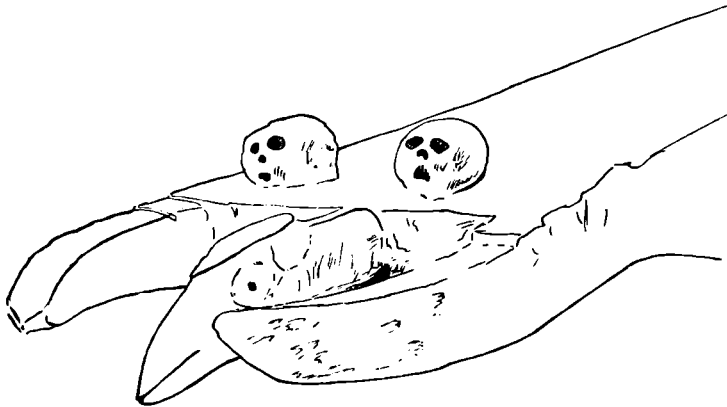
emblem sometimes worn on head-gear (Pl. 3, figs. 6 and 8). In the effigies it was carved from the wood. The effigies of women had a sort of broad arrow painted at the top of the forehead clearly representing the hair with its two triangular plucked spaces. In the case of persons whose heads had been taken by the enemy, and for whom, therefore, a skull receptacle was superfluous, the top of the head was high and rounded, instead of low and flat, and the horns were absent. They also had a tally of martial achievements cut in notches down the sides of the figure (Pl. 3, fig. 1).



2.

Effigy of a warrior whose head was taken by the enemy (Yonghong) at Angfang.

There is no chief of any sort, apparently, in this village, and no one obeys any orders at all. The village meant to be friendly, but gave a lot of trouble by being absolutely without any sort of perceptible organization—so like an Angami village! It came out here that both Yonghong and Angfang had been told by some *tripoteur* friend of theirs and ours that we were going to blight their crops. We did not discover who it was. Doubtless he hoped to stir up trouble that would end in cheap heads for him from a burnt and scattered village. Ongli, the Mokokchung Head Interpreter, re-assured them with the promise of a bumper crop as the result of our visit. As he said to Mills, any fool could see that the millet was promising extremely well. Indeed, the jhuming system of the villages round here is about the finest I have seen. Only millet (*setaria* and *sorghum*) and Job's tears (*coix lachryma*) are grown, but the whole hillside, and very steep it is, is most elaborately laid out in ridges and quasi-terraces



Carved paddy-husking table in a house at Angfang.

with logs cut from the pollard alders growing all over the slopes and everywhere most carefully preserved. The sowing too is obviously done with care, so that the plants are evenly distributed, and not, as by some Nagas, with the seed just thrown

down anyhow, thickly here, thin there. Unlike the jhums of other tribes, which are used for at least two successive years, the ground is sown for one year only, and then allowed to stay fallow again for three or four years, instead of the more usual ten, and this rotation is continued with apparently admirable results, showing what really can be done with steep and unpromising land by careful preservation of the alder and precautions against denudation. The Angfang people seem to propagate this alder (*aldus nepalensis*) from cuttings put in about April, but they told us at Chaoha that they grew it there from seed. Experiments in the Sema country have shown that neither method is at all certain of success when tried by amateurs.

This use of pollarded alders and more or less terraced millet fields reminded me very forcibly of the Angami terraced jhums of Khonoma and Mezoma, and still more, perhaps of the Nzemi jhums of Pulomi (Kenoma) and Chekwema (Yang Khulen), and the fact that these Konyaks here do not, as the Angami and Nzemi do, grow any rice at all, suggested to me very forcibly that rice must have come to the Angami as a wet crop first of all, when they were already accustomed to the cultivation of millet in dry but partially terraced fields.¹ If rice were introduced as a crop that must be grown under irrigation, its obvious superiority as a palatable food would compel the conversion of the partial terraces into finished terraces capable of holding water, and the cultivation of dry rice would follow subsequently as the result of accident or experiment. On the other hand, were rice introduced as a crop that could be grown dry, there would have been no stimulus to the enormous labour of perfecting terraces for irrigation on very steep land.

The Wakching Headmen met us here with a letter bag. Height 5,350 ft. in the camp below the village.

April 19th.—To Chaoha (or *Choha*, or, apparently correctly according to the village itself, for no one else can say the word, *Chohra*²), the "Towha" of the map. This village, never before visited, has a powerful chief, and closely resembles in general appearance the administered villages in the Wakching area. In going from Angfang to Chaoha we deviated eastwards from Woodthorpe's route, which we had followed, from Yanching, since the 15th. I was sorry to miss Saoching, a village of much repute, which is stated to manufacture guns, and where at any rate people who break the locks of their Tower muskets can get them repaired. Saoching is also said to make gunpowder, no doubt by the same rather unsavoury methods as are used by the Thado Kukis and the Chins³ and also by the Karens.⁴ Saoching are moreover reported to dispose of their dead in trees or on precipices in the erect posture, having smoked them stiff first.

We were exceptionally well received in Chaoha, the villagers falling over one another to supply palm leaves, thatch and bamboos, and to help in clearing a site.

¹ Cf. McGovern, *Among the Head-hunters of Formosa*, pp. 183, 184.

² N.B. -*ra* = 'village' in Angami, and is the real termination of all Angami village names.

³ Carey and Tuck, *Chin Hills Gazetteer*, p. 225; Reid, *Chin-Lushai Land*, p. 232.

⁴ McMahon, *The Karens of the Golden Chersonese*, p. 371, sqq.

The field-houses here are roofed with bamboo spathes, a material I have not seen used before, but which is said to be most effective and to last for years. The walls of the field-houses, as often in the Angami and Nzemi country, were built of rough stone-work.

The names of the streams here all end in *-âm*, apparently the same word as the Khasi word for 'stream' and the *Palaung* (Burmese) word for 'water,' and quite unlike any of the usual Naga words for 'water.' Mills tells me the Ahom is *nam*. I suppose it is the Mon-Khmer element shewing up again, and after all it is not so far from the country in which Peal found the square-shouldered hoes.¹

The chief of Chaoha had more tattooing on him than any Naga I have ever seen. Besides the face, arms and chest, the front of each thigh was tattooed, the shoulder-blades on the back, and the throat, the patterns mostly consisting of pairs of shallow arcs composed of two lines with a row of spots in between and arranged with the concave side of one pair facing the concave side of another.

Chaoha is at war with Chen across the valley. The chief, when asked whether he was also at war with Yonghong, Yaktu and Ükha, said no, he was at peace with them,—the better to take their heads, an attitude typical of this locality. For these people treachery is the only diplomacy. With Chen no doubt a state of war exists because Chen is a very big village indeed, and so strong that there is every reason not to take heads from it and so incur its active hostility; hence a state of war with Chen, and no risks taken unnecessarily. The enemy heads here are hung in a cactus-like (*euphorbia*) tree, which is in some sort sacred among the Kacharis,² instead of in a *figus*, as I should have expected in the Naga Hills.³ One may observe that both trees have one, and only one property in common. They exude a white milk-like juice, and it may be noted that the juice of the wild fig-tree was sacrificed to Juno Caprotina at a fertility festival in ancient Italy, while in Africa the Akikuyu apply the same milky juice to the body of a woman wishful to become a mother, and attribute to it the power of fertilization as do the Baganda,⁴ so that one may perhaps infer here an association between the milky juice and the fertilizing powers of the enemy dead. For the exposure of enemy heads when brought into the village Chaoha use a big globular stone like a Lhota *oha*,⁵ instead of the usual flat stone or stoneheap.⁶ They put up dolmens in front of their *morungs*. Enemies' heads, when cooked to clean off the flesh, are boiled with chillies and other ingredients calculated to make the foe smart.

Pandanus-fibre rain-coats, another link with the Angami,⁷ are worn rather longer and fuller than I have seen elsewhere, and men working in them tie them at the waist. We had reached the country where the poles that support the roof-tree project for

1 S. E. Peal, *On some traces of the Kol-Mon-Annam in the Eastern Naga Hills*. J.A.S.B., No. I of 1896.

2 Endle, *The Kacharis*, pp. 30 and 36. Cf. Frazer, *Golden Bough*, III, p. 155.

3 Konyaks as a rule hang them in their houses or *morungs* and not in a tree at all, putting their own dead in a *figus*.

4 *Ibid.*, II, pp. 313 to 318.

5 Mills, *The Lhota Nagas*, pp. 108, 166.

6 *J.R.A.L.*, I, II, p. 243; Hodson, *Naga Tribes of Manipur*, p. 117.

7 *The Angami Nagas*, pp. 26, 78, 386.

several feet through the roof and are thatched over (Pl. 9, fig. 5; Pl. 10, fig. 2). As the foot of the post rots, the post is let down and readjusted at the top, a most ingenious and economical dodge. The ties which keep the thatch on to the projecting post result in a series of bulges, separated by waists where the lashings are, suggesting irresistibly that this is the prototype of the series of diminishing bulbs that forms the pinnacle of an Ahom temple.

One of the Chaoha *morung* posts was carved with a bear eating a snake; the bear is rarely represented in the Konyak country, I think, though a common subject for carving in some Eastern Angami villages, where, however, it is very conventionally depicted, not, as here, naturalistically. As at Angfang, the drum-logs were tusked.

April 20th.—To Longmien, visited by Mr. Webster in 1913, dropping down on the way exactly 3,000 ft. in about six miles, before the ascent to the village, and the path a mere mud slide. At Longmien we were among the naked Konyaks, again, as at Yungya (Pl. 3, fig. 4). I noticed dolmens, and the approach to one *morung* consisted of a long raised stone path paved with flat stones (Pl. 4, figs. 6 and 8). In front of this *morung* there were high dolmens and one tallish menhir (Pl. 4, fig. 1).

The wooden effigies so familiar from Ükha to Chaoha are not set up here. Two figures only are put up, and that by the Ang (chief)¹ for a particular ceremony (Pl. 4, fig. 2). They represent two brothers, the elder and the younger, which suggest the origin story so widespread among the Naga tribes.²

There is a clan in Longmien of which the women shave the whole of their heads, and this custom is found, in other Konyak villages further north (Pl. 7, fig. 3; 11, fig. 7). The explanation given in Longmien is that this clan is descended from slaves, whose heads were kept shaven to make sure that their hairs should not fall into the Ang's food when they were preparing it. Having Naga servants myself, I sympathise with that Ang. The Pale tribe of Palaungs in Burma cut short the hair of their woman and give a similar explanation to that of Longmien (Scott & Hardiman, *Gazetteer of Upper Burma and the Shan States*, I, i. 492).

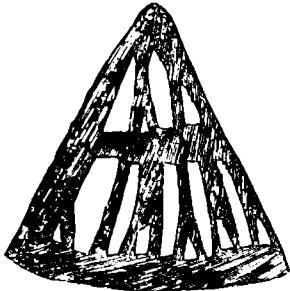
The memorials of both men and women here carry rows of dancing chignons—decorated bamboo tubes with a tuft of human hair fastened on at the lower end. Mills tells me that the chignon is worn by attaching it to the extreme end of the wearer's back hair, which is bound on to the outside of the top end of the tube, the tube being covered with leaves and hair so that the whole looks like continuous tresses. The women's memorial places had pot-making implements on them.

In some of the Angs' houses I noticed a large number of basket-work objects hanging in the roof. Some were figures of men, one, for instance, carrying a gun. Others reminded me of some sort of branching fungus or seaweed in shape, hung upside down, but were possibly merely the result of trying to combine many human

¹ For "Ang," V, *The Angami Nagas*, p. 385; *The Lhota Nagas*, p. xxxi.

² *The Angami, Nagas*, p. 112; *The Lhota Nagas*, p. xxxii and n.; the Thados claim descent from one of two brothers, the other of whom failed to emerge from the underworld; with the Chins, however, they seem both to have succeeded in doing so (Lewin, *Wild Races of South-Eastern India*, p. 237 sq.); descent from two brothers is also found in Fiji (*Man*, Jan., 1914), and in the Tonga Islands (Frazer, *Belief in Immortality*, II, 65). Cf. also Playfair, *The Garos*, p. 9.

shapes into one basket. The field houses here were of an unusual kind, being not unlike the single buffalo-horn type, but with the base end made into a circular building.¹



Basket in the house of the Ang of Longmien.

April 21st.—To Chinglong, which seemed very nervous and apprehensive of us, and not unnaturally, as the last visit, in 1913, was punitive. All the heads in these villages from Angfang on were hidden before we arrived, for fear we should burn them, as was done with those of Wakching and Wanching, when they were first administered,—a wicked sin.

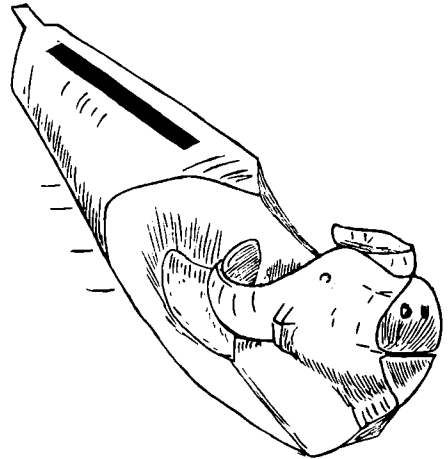
The drum-logs here had naturalistic buffalo heads again, and the *morungs* had erect stones in front of them. The men are normally naked except for their long cane belts, the continuous cane strip wound

round and round in many coils.

April 22nd.—To Chingtang, crossing the Yangnyu into administered territory by a bridge slung on wire ropes. At Chingtang we noticed an ingenious implement for mat weaving, a sort of frame round which the mat is rolled up as the weaving progresses, keeping it out of the way instead of making a greater hindrance of it the larger it gets.

On the dancing boards (squared logs hollowed underneath, which reverberate when stamped upon) of one *morung* I saw a carving of a frog with a crescent in close juxtaposition to its nose. This crescent, they told me, was the moon. I have never seen the moon represented in anything less than the full circle in the Naga Hills before, and I cannot remember having ever seen a carving of a frog. I could get nothing more out of the Chingtang people, but I suspect that what is represented is an eclipse, and that the frog is eating the moon, as in the Khasi story of Ka Nam.²

The Kachins also regard an eclipse as being caused by a giant frog's eating the moon (or sun),³ the more common account in Assam being that some monster or dragon is the offender, to which parallels could be cited from as far east as Kambodia and as far west as South America, not to mention Europe and the Pacific. The Miris and Akas of the North bank of the Brahmaputra



Dug out "drum log" in Chinglong.

¹ V. *supra*, April 13th.

² Rafy, *Folk Tales of the Khasis*, I, where *hynroh* is translated "toad"; according to a reliable Khasi informant of mine *hynroh* is used for "frog" or "toad" indiscriminately.

³ Hanson, *The Kachins*, p. 119.

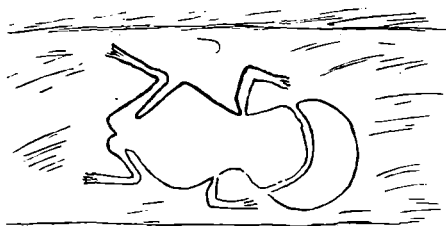
impute it to a god, and the Lushais to the soul of a Chin chief, and the universal method of averting the calamity is to make a horrid clamour and beat empty kerosine tins, "*crepitu dissono*" is Pliny's¹ expression, and Livy has it "*cum aeris crepitu, qualis in defectu lunae fieri solet, clamorem edidisse.*"²

Here there is a heap of stones, mostly oblong, in front of the Ang's house, to which a stone is added for every enemy head taken and exposed on the heap. The Tangkhuls also expose their enemy heads on heaps of stones, in front of the *khul-lakpa's* house, I think, but Hodson, who records the practice,³ does not

say that a fresh stone is added for each new head, nor do I remember having been told so by Tangkhuls when shown their sacred stone-heaps myself. The Chingtang stone-heap had a forked stick beside it, at which a 'mithun' had been slaughtered.



Weaving mats in Chingtang.



Carving of Frog and Moon in Chingtang.

I noticed here an unfamiliar tattoo mark on the women, worn just below the throat, and a lattice tattoo—a herald would call it 'masculy,' on the shoulders, not at all unlike that affected by the Säng-täm women near Thachumi very far south of this, and reminiscent of that worn on the breast by the women of Yonghong, etc. The Chingtang women all wear the familiar Konyak navel tattoo, a cross with each arm formed of three parallel lines running outward from the centre.⁴

The tattoo of the men (Pl. 4, fig. 4; 5, figs. 1 and 3), while obviously derived from the same theme as that of the Changs, is extraordinarily like that depicted by Jenks⁵ as fashionable among the Igorot of Luzon in the Philippines, and there also a sign that the wearer has taken a head, though in the latter the human figure has become a mere crosslet.⁶ The Bornean Ukit tattoo depicted by Hose and McDougall⁷ is perhaps only another derivative of the same pattern.

¹ *Nat. Hist.*, II, 12.

² Bk. xxvi. Quoted by Dalechampius on the above passage in Pliny.

³ *Op. cit.*, p. 175.

⁴ *V. supra*, p. 13.

⁵ *The Bontoc Igorot*, Plates clxiii-clxvi; p. 188.

⁶ Cf. also the face tattoo of the Menimene of Ecuador, who also affect a lizard pattern, and perhaps "three vertical blue lines on the chin" (Whiffen, *The North-West Amazons*, pp. 86, 87. He does not describe the patterns used on the breast).

⁷ *Pagan Tribes of Borneo*, Pl. 178 (vol. II). The description of the Dusun tattoo on p. 265 (vol. I, *id.*), reads like another derivative of the same.

April 23rd.—To Wakching. Here we heard many stories of the privy politics and intrigues of the Yungya-Kamahu affair. Apparently the original plot was to cut up all the Kamahu party, largely women and including children, which had gone to the plains to buy salt and was due back the day following the evening which the actual killing took place. For this purpose a large number of the Yungya bucks were assembled in the jungle, the whole plan being originated by Shopen of Tangsa or his son Hams-hen. Their pitch was queered by the four Yungya men who went down to the river the evening before the coup and alarmed Kamahu by taking the head on our bank. This was apparently an impromptu affair, the sight of the unprotected Kamahu men, fishing and unaware, having caused the hands of the Yungya scouts to "itch."

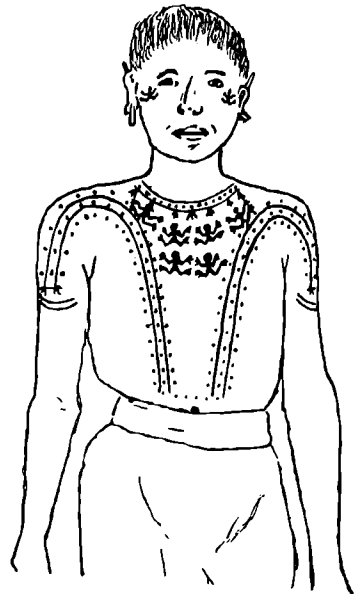


Konyak tattoo (a man of Wakching).

It also came out that the two recalcitrant clans of Yungya had in preparing for our visitation built two large granaries below the *morung* of their accommodating friends the Tangsabang clan, feeling confident enough that we should not touch their

contents there. And rightly, for we did not, but their Tangsabang friends did, for when the recalcitrants got back, after we were well away, devil a basketful of rice did they find left in them at all. Yet it is hard to tell what else they could have expected—*verum amicum qui intuetur tanquam exemplar intuetur sui*. They would certainly have done the same themselves. It was the day after we reached Wakching that thirteen houses of the Tangsabang clan took fire mysteriously at night.

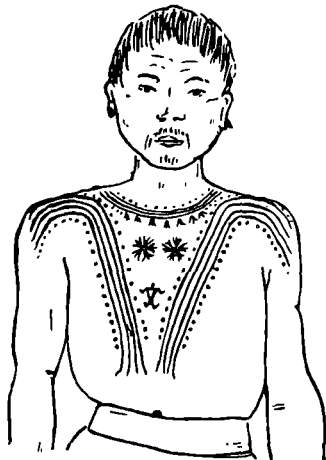
April 25th.—Mills left for Mokokchung *viâ* Tam-lu, while I went down to Kongan to get back to the railway, for which the escort had left the day before. Very plentiful along the track was a certain wild fruit now ripe, which we struck first at Yungya and which grows all through this country. The tree which bears it is of a very considerable size, and the fruit has a pronounced taste of strawberry combined with the acidity of many lemons. I can conceive that if cultivated it could be made into a most delicious fruit, meanwhile it is too sharp to eat more than a little of raw or very much of even when stewed. The Gurkhas call it *kaphur*, or



Konyak tattoo (Aku of Chinglong).

something like that, and the Nagas of Kongan spoke of it in Assamese as *bihu thenga*, the 'spring festival fruit.' It is well named, for Kongan were actually celebrating their spring festival when I got there. The village was in gala dress, and the drumming never stopped at all. The younger bucks were dancing in full war paint, swinging their shields from side to side and banging their daos on them. They had lines of white lime splashed across them, across faces, chests, arms and backs. This represented wounds caused by dao cuts, but whether the badges of their own bravery, or aids by sympathetic magic to the gashing of their enemies, I could not find out, and I am not at all sure that they had any idea themselves. I noticed that the fully grown adults did not take much part in all this, though in an Angami or Sema village all but the really quite elderly would have been in the thick of the fun. Here it is opium, I suppose, which has made them all *blazé* before they are full grown.¹

The Kongan men in this kit wear neckbands of red cane and yellow orchid-stem very like those of the Angami, but mounted on a white bamboo mount, broad at the back and narrowing to the ends.



Konyak tattoo (a man of Wakching).

I took some photographs here of the decorated skull of a man recently deceased, the same skull, I believe, as was shown to Balfour and Mills in the cold weather (Pl. 6, figs. 2 and 4). The pattern is different from that of Namsang, where they ornament them with the usual breast tattoo pattern, at least the one I saw there in 1914 had that tattoo on the forehead. Probably no two are alike, for Woodthorpe mentions,² in describing the Konyak customs of disposing of the dead, that at Khanu the skulls of the dead are collected in cairns and that "each head is decorated in a slightly different way from the others in order that they may be recognized by their surviving relations." This is perhaps borne out by the fact that, since I could not well ask for the actual skull of their dead, I asked my Kongan friends to paint me a monkey skull as if it were a dead man's. They did

¹ Mills comments, "I think it goes deeper than that. It has been pointed out to me that among the Konyaks, the power lies with, and decisions are taken by the young men, acting by *morungs*. This is contrast to other tribes, e.g. the Aos. In the Changki group of the Aos, which, I feel sure, contains a larger "Konyak" admixture than any other Ao group, the *tâtär* (elders) are young men who only hold office for three years. In all Ao villages each *morung* has a complete set of *tâtär*, who, (though boys, have absolute control inside the *morung*. The village *tâtär* can be fined if they attempt to interfere." The *morung* group he tells me, are usually composed of one or more clans, which are represented on the *morung* governing body, the same clan not often being represented in more than one *morung* whereas each *minden* ('relay') of village *tâtär* usually contains representatives of all the clans in the village, with a member of the Pongen clan as its titular head."

² Report (to Capt. J. Butler, Political Agent in the Naga Hills) on the tribes visited during the punitive expedition to Nimu in the Survey Operations of 1873. MS. in the Deputy Commissioner's Office, Kohima.

two for me, but neither was of the same pattern as either that of the dead man or of the other monkey-skull. It may be noted that among the Kayans of Borneo women are tattooed on the chest to facilitate recognition in the next world.¹

I could not induce the Kongan people to make me a model of the solid sandstone boxes in which the skulls are placed, and which are covered with a flat square stone (Pl. 6, figs. 1 and 5). I could perhaps

have carried off an old and empty one, the contents of which had rotted away, but the weight would have been excessive. Further north at Yanha ("Joboka") I have seen the skulls of the dead simply placed out on stone slabs (Pl. 5, fig. 2), arranged in tiers where the ground sloped, and recalling the more elaborate skull shelf on which the Taiyals of Formosa place their enemies' heads,² the Yanha Konyaks putting their enemy heads on a bamboo shelf inside the *morung*. The Yungya habit of putting the head of deceased relatives in a pot buried to the rim in the ground has already been described. In Kongan at any rate, the skulls of the less important people seem to be merely covered with a conical frame thatched with "tonkopät," very like the Kachin funeral houses (Hanson, *The Kachins*, p. 208).

April 26th.—To Naginimara, where I stayed with the colliery manager for the night.



Skull of a dead householder of Namsang decorated on forehead and with one tuft of hair retained, placed on a rough bamboo wicker stand and partly covered with a cloth and placed by the hearth by his widow. There were flowers on the top of the stand and a necklace of ornamental seeds and a drinking cup, hung on the stand. The widow said she had put her husband near the fire, as the weather was cold and she moved him, stand and all, to make room for me (Dec. 1914).

Nagas, mostly depatriated Semas, have at last taken to work underground. At first they refused to enter the shafts at all, and even some of my own interpreters were afraid to go in with me in 1916. The fear of the underground is great, and I remember how I was told by the Semas of Lukobomi and Tsivikaputomi that the cave below their villages went right to the bowels of the earth, as no one had ever been in far enough to reach the end. This latter was true, and not a soul from those villages had dared to go in far enough to find out that the cave was not more than fifteen to twenty feet deep, nor would they come into the dark with me to see. We may smile at their fears, but perhaps less separates us from them than we are apt to think. Kohoto, my Sema Interpreter, tells me that there are Sema mediums, *akhashemi*, who go into trances (and knowing their kind I can make sure that they "twitch and stiffen and slaver and groan" with due realism) during which their clients are enabled to speak with their dead. These do not appear visibly, but

¹ Hose and McDougall, *op. cit.*, II, 242.

² McGovern, *op. cit.*, pp. 114 and 115.

Speak audibly with their own and recognizable voices, so presumably there are Semas acquainted with ventriloquy, which I had not known. The Maoris used to indulge in exactly the same ventriloquial seances, apparently,¹ and also the Polynesians of the Marquesas.² Mills tells me of Ao mediums who go into trances to speak with the dead, and of one of them who, being in heaven in the spirit, was bitten in the body by an earthly flea—and scratched, paying pork as penalty to his client. The Road to En-dor is easy to tread, apparently, for primitive as for civilized man, and is beset with not dissimilar incident.

April 27th.—To Sibsagar Rd. Railway Station.

SECOND TOUR.

OCTOBER AND NOVEMBER, 1923.

This second tour was also undertaken under the orders of Government in order to obtain some knowledge of the unadministered and hitherto unsurveyed and unvisited area east of the frontier and the known country that adjoins it. Mr. Mills accompanied me from the 18th to the 31st of October, but unhappily was prevented from accompanying me in the month of November by a poisoned foot, which to his bitter disappointment, compelled him to remain in Mokokchung unable to walk. His place was taken by Mr. C. R. Pawsey, M.C., the officer destined to relieve him at Mokokchung. I had an escort of 50 men of the 3rd Assam Rifles under an Indian Officer.

From the 14th to the 24th of November we were in country which, as far as I know, had never before been visited by any European at all and was, for the most part, entirely unsurveyed.

Oct. 9th.—From Kohima to Khonoma and back, to see the new “forts.” The three *khels* have erected each a big stone *dahu* (Pl. 7, figs. 1, 2, 6 and 7).

These have cost a tremendous lot in labour and expense, and are magnificent specimens of Angami stone-work which cannot be approached in any village in the hills. They contain a great deal of dressed stone, which of course the older erections did not, though Samaguting claim to have used dressed sandstone for graves before the British occupation. The Merhema *dahu* has stone water spouts, and projecting stones bored with holes to carry the bamboo scaffolding used to build the upper parts of the wall.³ In the case of this *dahu* the parapet round the top is dressed to a fine edge instead of being merely composed of flat stones. The Semoma *dahu* has a very large platform of rough stone filled with earth and a rather smaller tower, made partly only of dressed stone, with the usual sitting place in the top. The lower platform is to be partly paved later to cover the graves that there are in it. The Thevoma *dahu* is at present much like that of Merhema, bigger but not quite so well built; the lower platform was to have been much broader on one side though

¹ *Old New Zealand, by a Pakeha Maori*, ch. x.

² Frazer, *Belief in Immortality*, II, 370.

³ Mr. E. H. New tells me that this method was anciently used in Britain. If so it must be a case of independent invention on the part of the Nagas.

not so big as Semoma. The ground, however, has slipped and the whole of this has gone. It was flagged out with stick and strings, and I gave leave for it to be rebuilt to the extent from which it had slipped. Merhema had a blank tablet ready and a written inscription to be vetted, and I passed an inscription saying that the *dahu* had been built with the permission of the D.C. Semoma had already put up an inscribed tablet in better English than I should have expected setting forth the history of the affair in a quite unobjectionable manner, but adding that "J. H. Hutton, etc., etc.," had given leave for the erection of the *dahu* on which account they were "heartily pleased to erect this stone to the memory of Mr. Hutton," and requested Govt. officials not to interfere with it. This seemed a little premature, and as they had of course added nothing about my threat to pull the *dahu* down again, I ordered them to put up a revised inscription leaving me out of it. Thevoma had wisely refrained from any sort of tablet. They nearly always show better taste than the other two clans, to that extent justifying the claim of the Thevoma to be the aristocrats of the Angami Tribe.

Oct. 15th.—To Dimapur. By train to Safrai leaving Dimapur about 11-30 p.m. local.

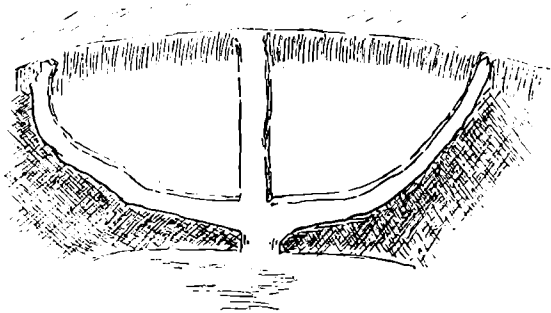
Oct. 17th.—To Longlām. A long hot march—18 or 19 miles through Safrai and Singlo Tea gardens and the Ābhaypūr Reserve. In the first 16 miles we rose only 200 feet, that we did not lose again but 1,300 in the last 2 or 3, camping at about 1,800 feet. Sandflies and mosquitos bad. A small village of some 20 houses was found to be unmarked on the map.

Oct. 18th.—To Wangla about 12 miles. Met Mr. Mills and the escort—a Jemadar and 30 rifles. Men from the village of Auching to the south met me on the way. The chief was wearing a helmet covered with fish scales. Found the Sangnyu, (Changnoi) headmen in, and also those of Ngangting to which we were going. All very friendly. Height 2,400 ft. At Wangla there is a wooden throne for the *Ang*, who alone can use it, and also a bed, or bier, kept in the *morung*, on which dead *Angs* are laid out. They have an old iron cannon in one of the *morungs*, much damaged by fire when the *morung* was burnt. It was found and brought back from an old iron foundry of the Shans at the foot of the hills. Mills mentioned that the Kamahu people looted old mithun heads from Yungya during his recent visit there in order to transfer to Kamahu the *arēn* ('mana') that was in the mithun heads.

Oct. 19th.—To Ngangting. We crossed the frontier at about 500 ft. and went on to the village—2,000 ft. A camp had been cleared ready. The headman of Sangsa, ('Hangha,' 'Buragaon') met us on the way. He was wearing beads of tiger bone. The headmen of Zakkho all came in with salaamis, and the women and children were in the village and all peaceful. The village is small and scattered and the *morungs* poor. They gave me the name of the stream beyond Sangsa as "Teijat." It is a tributary of the Taukok, and the hill at its source is Chakkihua. We decided not to stop at Zakkho but to go straight to Sangnyu.

Viā Zakkho ('Gako,' "Jako" on map), a small village about 3 miles east of

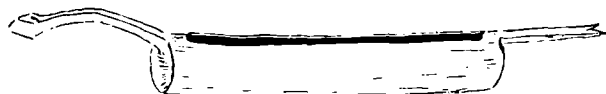
Ngangting and 3,050 ft. up to Sangnyu. ("Changnoi" on map). The map is bad and misleading, but the path not so far as it appears on the map. The Zakkho *morungs* were carved with human heads done in the typical Angami style, and in front of the *morungs* were rounded stones for putting the weight as the Angamis do. The head tree at Zakkho was a *ficus*, whereas that at Ngangting had been an *euphorbia*. I noted on the connection between these two on my tour of last April (*vide* my entry of April 19th), since when



Morung door at Ngangting made from a single tree-trunk and branches.

I have found that the Zumomi Semas plant an *euphorbia* when they found a new village and the Maoris of New Zealand speak of *euphorbia* juice as "milk of the gods,"¹ the gods being apparently identified with the dead in this case.

At Zakkho we saw burials which combined the wooden figure of the deceased



Drum in Ngangting, open at one end, fish tailed (horizontally not vertically) and a head said to be that of an hornbill, 19-10-1923.

man (we saw none of women), very nicely carved, with a second burial made some eight or ten days later when the head is put

into a pot, with a stone dolmen-like altar over it for offerings and other offerings in other pots also half buried alongside, reminding me very forcibly of the prehistoric burials described by Mitra in Central India.² One figure (Pl. 7, fig. 4) had three hand-arrows stuck into the ground alongside him neatly coloured with a spiral stripe made by twisting round a sliver of bamboo and then smoking the whole and taking off the bamboo to leave the unsmoked stripe underneath. The Kukis dye porcupine quills with a spiral stripe on the same principle. The figure has a little house of its own by the platform on which the body rests, and the friends of the deceased come to mourn in front of the statue. The pot in which the head is ultimately buried is covered with a flat stone and the skulls of 'Angs' (Chiefs) are painted with the tattoo worn by them during life, and their own hair is also attached to the skull. A few old skulls were noticed in the *morung*.

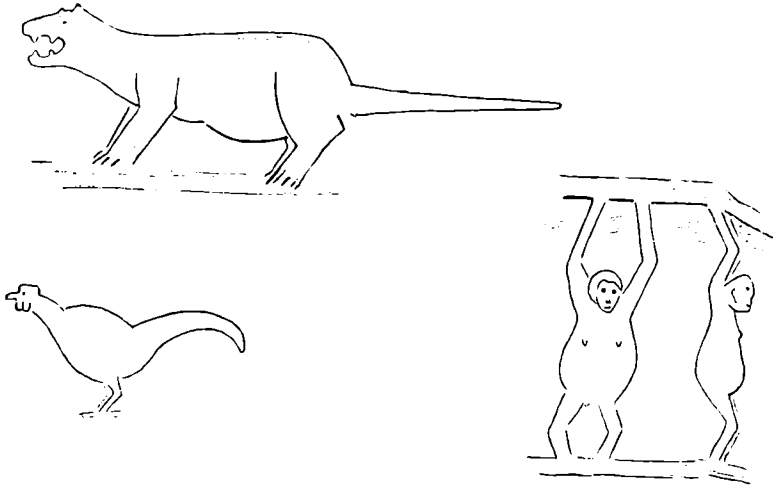
Sangnyu is about 20 miles from Ngangting and is a fine big village. They had cleared us a big camping ground in a fine site at the edge of a cliff and with our own water, and proved very friendly. There are four *morungs*, with from 20 to 50 heads in each, mostly taken from Zangkam on the next ridge. The 'Ang's' house was enormous. It had 27 posts supporting the central roof tree and measured

¹ Frazer, *Belief in Immortality*, II, 36.

² *Prehistoric India*, p. 201.

130 longish paces from the front door to the back, the eaves of the gables excluded. It contains a magnificent piece of wood about 20 ft. long by 12 ft. high at least, and must have been at least six ft. thick at one end originally, but the thickness was cut away leaving all sorts of carving in relief, some in high relief, other parts standing on projecting ledges and cut entirely out away from the background, but all done in the same piece of wood.

There were two big tigers, one broken, the other very well and realistically carved, a couple of warriors, and a mother suckling her child, but broken. A man and a woman performing the sexual act; a cock crowing, excellently carved; a big snake; a double rainbow; *huluks*, very natural; human heads; other less striking things, and a *joppa* standing absolutely clear of the main block and carved completely and hollowed inside as a receptacle for odds and ends with a detached lid. There was



Carvings à jour in the house of the Ang of Sangnyu.

also a long *gadi*, the size of a bed, with a foot-rest along one side, like a shelf, all carved in one piece of wood, on which the 'Ang,' alone may sit, and two smaller thrones of the same pattern but portable—also in one piece of wood each (Pl. 9, fig. 9). On the platform outside the house was a flat stone. The Ang's particular sitting place was carved with the pattern of a pair of feet like the Manipur stones at Kohima and elsewhere. All this carving was ascribed to a more or less mythical ancestor and must be excessively old, though all but one of the "thrones" are as good as the day they were made. The height of Sangnyu is about 3,500 ft. and was a pleasant change from the low hills. Zangkam (Rangkam on map) Longphong (Huro Changnoi on map) and Nyasia (Niassia on map) came in with presents of pig and chicken and goat. Nyasia has recently moved S. of Chakkihua hill.

The *Ang* of Sangnyu has an iron cannon, which we saw, and the story of how he

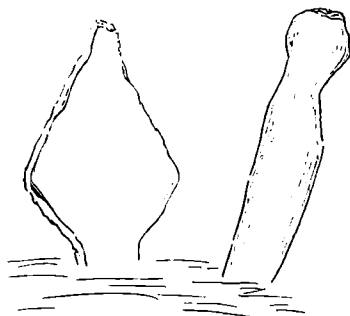
came by it is this:—The King of Assam invited the Chief of Sangnyu, his son, and his daughter to come down and see him under a safe conduct. They came, and the King of Assam then proceeded to behead the Chief, and by way of a little pleasant sport ordered the son to violate his sister in public. The boy refused and was told the alternative was death. He refused again, but his sister persuaded him to do it to save his life, and they were then let go, and went back to the village, where the girl hanged herself. To revenge the treatment of their chief and his family, the people of Sangnyu then started to make war on the plains, and did it so effectively that the Assamese sued for peace, and the King gave Sangnyu a cannon as an indemnity. Boat coffins are made for the dead as elsewhere in the Naga hills¹ and also by the Karens² in Burma. A wooden pillar (Pl. 8, fig. 6) in front of the *Ang's* house reminded me of the cylindrical posts at Dimapur, and an erect stone outside one of the *morungs* was definitely stated by them to be a phallus intended to promote the fertility of the crops and cattle, though this was only in answer to a leading question; as a rule they are very reticent on the subject.

Oct. 21st.—To Môn—about 10 miles, camping below the village at 3,350 ft. On the way we passed through Longphong after passing which eight of our coolies ran away, but Ahon managed to get them back again, and we got on after only half an hour's delay.

The *Ang* of Môn has a fine house (Pl. 8, fig. 1) 120 paces long—long paces too—and the village was most friendly, and presented us with a mithun. There are stone sitting-out places here, and, in front of the *Ang's* house, a huge pile of stones to which a small erect stone is added for each enemy head brought in, the head being first exposed on a high stone table (Pl. 11, fig. 6), which forms part of the pile, and ultimately housed in the *morung*, not apparently in the *Ang's* house. A bush of *euphorbia* grows at the top of the pile. The village contained an enormous number of elephant skulls.

We noticed again here the dodge of drying paddy before use by putting it into a long wooden trough and pouring in hot stones. It gives it a slightly burnt taste which is perceptible in the *modhu* brewed from it, and which is said to improve the taste of rice which has been dried in the sun, merely, before husking. The custom seems to be adopted by all the villages here. Can it be an adapted survival of the pre-pottery age, when cooking was done this way with hot stones?

Representatives from Phukotong and Sengha (Yingsha-Huong) came in. Both are dependencies of Môn.



Erect stones seen in Sangnyu.

¹ Mills, *The Lhota Nagas*, p. 157. See also Hutton, *Assam and the Pacific*, (a paper read before the Indian Science Congress, 1924).

² McMahon, *Karens of the Golden Chersonese*, p. 303; Scott and Hardiman, *Gazetteer of Upper Burma and the Shan States*, I, i, 535.

Oct. 22nd.—To Chī (i.e. "Chui" or "Chimi"), the path going down into a deep valley and up a steep hill again. The distance about 7 miles and the camping ground on the far side of Chi from Mōn at 3,525 ft. above sea level, the village itself probably being about 50 ft. higher.

On the way we met a huge concourse, constituting a deputation from Tang, the *Ang* himself (Pl. 11, fig. 5) coming in with about 100 or so retainers, all very well got up in their best clothes. The *Ang* of Tang is a very important chief, and appears a decent fellow. The chiefs of all this area have great personal power and sanctity. Their authority is unquestioned, and their persons are *tabu* very much like those of a Samoan or a Maori chief.

Chī proved as friendly a village as I have ever been in. The *Ang* has a fine house 117 paces long, with two great stone seats in front of it (Pl. 8, fig. 8), and beyond that a conical pile made of small erect stones, one being added for each taken, and an *euphorbia* growing on the top (Pl. 10, fig. 2). In the verandah of the house was a shelf with three rows of skulls on it, but none very new (Pl. 8, fig. 3). The *Ang's morung* adjoining held a few still older ones, some skulls from the *Ang's* house being transferred ("thrown away") to the *morung* on the death of each successive *Ang*. A freshly-taken head is first exposed on a flat round stone at the foot of an erect one in front of the *morung*, then put into a basket to rot in the jungle. When more or less clean it is hoisted on a bamboo tied to the erect stone (Pl. 9, fig. 5) and left there till the next *aleapū* genna, the important annual ceremony here, when the young corn is beginning to sprout up high and has to be weeded. At this genna it is taken down and transferred to the *Ang's* collection except in the case of head-takers of the *Ang* clan, who are allowed to take them to their own house, where they hang on the verandah.

There was only one head of this year's taking, doing its turn on the bamboo, so the bucks of Chī probably do not take many heads. Human sacrifice as a regular institution is not practised in the Sangnyu, Mōn, Chī and Totok areas, though it is known to exist further to the North-East. The throat tattoo, of which I photographed a rather good fresh specimen, is only worn by the man who has actually severed a head, and the man I saw with it (Pl. 10, fig. 6), was the severer of the head referred to. The chest tattoo is apparently put on on "touching meat," and the face tattoo for taking part in a raid, the principle generally corresponding to that on which the *Angami* wears his ornaments.¹ (Pl. 9, figs. 4 and 6.)

The women of this village were particularly taken with the pipes.

Oct. 23rd.—To the Shīnīōng. Men from Totok met us on the way to remonstrate with us for not having visited their village, and I promised that I would do so sometime. Lengha porters came in to carry us up to Wakching the next day. We found them sitting by the path in a big way-side shelter. They had built a temporary seat for their *Ang* to sit on, a wooden bench as long as a bed, but no one but the *Ang* could use it till we turned up, when he politely offered it to us. All the others had to sit on the floor.

¹ *The Angami Nagas*, pp. 29 sqq., 32.

The *Ang* of Lengha is a subordinate of the *Ang* of Chi, who sent a mithun down so that we should have something to eat in the jungle, not to mention two pigs and a goat and some fowls, supplied by Chi, Totok and Lengha, so that there was more meat going than all the camp could manage.

We went through Shiong on the way. Just outside that village is a flat stone on which every baby born is put as soon as it is born. An offering is made there to the stone at the same time. The infant is taken to the stone by three children of its own sex, one of whom carrying the infant sits on the stone while the other two sit on the ground.

Oct. 24th.—To Wäkching. The anti-syphilitic campaign has worked wonders. I have never known Rs. 1,000 spent to better purpose. What we want now is an anti-leprotic campaign on the same lines, as there are three leper segregations within reach.

Oct. 25th to 27th.—Through Tämlu to Merangkong.

Oct. 28th.—To Chàngtöngia. A schismatic Church has arisen here, the original Christians having been separated off into a different village, and those who did not want to leave the old village have founded a Church of their own inside it, with the usual resultant disputes.

Oct. 29th.—To Mõngsëmdî. Raining when we started, and cold and sunless all day. Outside Ungr we found a curious looking arrangement of two miniature '*machāns*' (platforms) put up not far from one another and close to the public road. On each was a couple of tobacco pipes. I learn on enquiry that a man of Chuchu had here met a young woman of Ungr, and had intercourse with her at these two spots and that an evil spirit has taken advantage of the opportunity to attack him. The *machāns* were erected on the exact places and the pipes put on the *machāns* in order that the illness might be put away with them. Pipes are selected because the interchange of pipes is a love token between young couples. At the ceremony accompanying the erection of the miniature *machāns* the sexual act is repeated symbolically by ramming earth and water into nodes of bamboo with a pretence of secrecy.

Oct. 30th.—To Mõkõkchung. On the way I saw for the first time the damage done by the cloud-burst that occurred here on the evening of July 31st. The rain only lasted from 8 p.m. to about midnight, but the damage done was extraordinary. There was no wind, and it was all done by water falling. The trees were broken and up-rooted. The Impur Mission compound fencing was totally destroyed so that the boundaries could not be traced, the iron gate and padlock being lost entirely and not yet found though they can hardly have dissolved in the rain. Enormous slips were visible like great scars on both sides of the Mëning valley and the streams we crossed, which used to be little streams and dry now, had been converted to great chasms littered with debris of broken rocks and broken trees. In places the surface of the ground, where there was no watercourse at all, had been denuded of all growth and cleaned as if for jhuming almost, while elsewhere huge rocks had been carried down from the top of the hill and left where there were no rocks

before. I called in to see Miran on my way through Mōkōchung village. He seemed very bad and cannot last long, but was obviously expecting our arrival at his house.

Oct. 31st.—Halted Mōkōchung. (About lunch time they sent to tell me that Miran had died having waited to see me first.) Mill's foot was very bad with septic leechbites, and it was doubtful whether he would be able to come on on the 4th or not.

Nov. 1st to 4th.—At Mōkōchung. Very busy with all sorts of arrangements until the 4th. I was to have started on the 4th but the 3rd was very wet, and as the morning of the 4th was very bad, I put it off for a day in the hope of better weather.

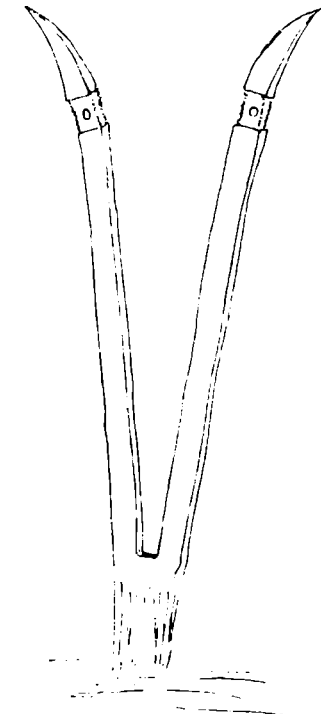
Nov. 5th.—To Chārē about 9 miles, where the gaonburas of Álisōpō, Chatangrē, Thungāre and Chongliemdi came in also, all very friendly. Mr. Mills being unable to walk, I left him in Mōkōchung, Mr. C. R. Pawsey going with me.

Chārē is a Sāngtām village with an Ao khel in it, the Aos putting their dead on *machāns* (while Sangtams bury) and otherwise keeping up Ao customs. It is a long

time since there was any head-taking here, but I noticed a row of old gourds representing heads on the outer wall of an Ao house, one of which had a cranium attached and two others lower jaws; these were probably taken from Litim many years ago. Sangtams put their heads in the *morung*.

Nov. 6th.—Halted Chārē. There are about 200 houses and it is one of the biggest Sāngtām villages left,—the biggest, if the Aos in it are included.

We went up to Chongliemdi 3 miles off at the top of the hill, a small village of some 30 or 40 houses, and paid a visit to Lungtrok (Pl. 10, fig. 8), the famous "Six Stones" from which all the Aos derive their origin, as well as the Phoms and, I think, Sāngtāms hereabouts. Only three of the six are standing, and the biggest (Pl. 11, fig. 1, "the female stone," as it was pointed out to me) was knocked down by a Christian evangelist, who destroyed a small phallus which stood in front of it and was later visited, I am glad to say, by a series of well-deserved misfortunes. Two of the still standing stones (Pl. 11, fig. 2) were described to me as "male stones." The sixth was hard to find and we were told that one of the stones appeared and disappeared at its own caprice, but we eventually



Y post in Chārē.

found it leaning up against a *ficus* of some sort. There was also a very small erect stone east of the path. All are in a patch of heavy jungle which may not be cut at all, and the stones may not be touched as to do so would cause storms of wind

and rain and hail. The "female" stone has a natural fissure in its surface with a deep hollow behind.

In some traditions the Chàmir phratry do not spring from this female stone like the Pöngén and Längkäm̄r but come from one of the two "male" stones, which possibly reflects a real distinction in culture between the phratryes, one of them, possibly having had a matrilineal system, distinct from the patrilineal one of another stock. The Wózákäm̄r clan are fined if they claim origin from the stones at all, as they are descended from an old woman who was weaving when a horn-bill's tail feather fell on her from a bird flying over. This took place close to the *morung* in old Chongliemdi the site of which is still shown. This old village adjoined the Lungtrok, but what remained of it moved to its present site higher up about a generation ago. The old house sites are clearly identifiable in the jungle near Lungtrok.

We then visited Chatógrë, a village of about 150 houses half a mile or so south of Chongliemdi. The drinking water at Chare all slightly flavoured with the blossoms of a flowering tree, and a very pleasant flavour it was.

Nov. 7th.—To Chimongre, a Sangtam village of some 200 houses or less in three *khels*, all squalid filthy hovels of the typical Sangtam type, and very dull. The only features of the least interest are the drum sheds (Pl. 13, fig. 7) built like the little Lhota *morungs*. The heads are hung there (Pl. 12, fig. 7—13, fig. 5), in accordance with the Chang custom, the real Sangtam custom being to hang them in a golgotha at the edge of the village, like Sema and Yimtsungr (in map Yachungr), but these Sangtam villages have a good deal of Chang blood, and are very much under Chang influence and will sooner or later turn into Changs, I fancy. I could not find that any other *morungs* existed at all. This again is a Chang custom, as Changs do not use their *morungs* as sleeping places for the bachelors, though Sangtams normally do, and build huts for the bachelors even when they let the *morung* fall into disrepair and decay.

The houses are very like those of the Lhotas, but dirtier and more crowded. The water was the worst I have ever met in any Naga village at all—a horrid contrast to that at Chārë, and the Indian officer in command of the escort probably diagnosed it correctly as diluted cow's urine, and it might well have been worse, but there was nothing else to drink. The people were very friendly, and the camp wallowed again in meat. We passed through Thungārë on the way, and changed coolies there, a feat which gave us a great deal of trouble, as there was a strong tendency to bolt. Thungārë is about half a mile from Längsipëk, another small Sangtam village, no doubt as squalid as Chimongre and Thungare. The path goes down from Chārë to the Chingo stream; then up to the Thungare-Langsipek-Alisopo ridge; thence down to the Chimei, a very steep, almost precipitous descent, and, after a similar ascent out of the gorge, a steep climb to the next ridge. About 10 miles in all, but hard going.

Nov. 8th.—To Chongtorë, ("Chisang" of the Changs). About 6 miles along the ridge southwards. At the peak called Longtok, just below which the path runs,

we halted for an hour and got into helio communication with Tichipāmi, while the surveyor added to his map; there was a magnificent view from the peak. Thence down to Chongtore, a Sangtam village of about 120 houses, camping ground good and good water. Chongtorë, although Sangtam, has a very strong admixture of Chang blood, and builds its houses in the Chang manner. The physique of its inhabitants is fine and the Changs ascribe this to their blood. The Changs themselves are a new tribe. Their chief village—Tüensang—has only existed for 11 generations, and a number of their clans now regarded as pure Chang in blood, and speaking no other language, are known to have had an origin from Konyaks from Ängfäng, or Yimtsungr from somewhere else.

The Chang language seems to have Kachin affinities. My friend, Chūrāngchū of Anangbā, came in here; a stout fellow, who went as a simple labourer to France, since, not knowing Assamese, he could not go in any other capacity, though the chief of his village. He smuggled back a Mauser rifle and 60 rounds or so of ammunition, and it got safely across the frontier to his village. Unfortunately, Mills heard of it and demanded its surrender. Anyhow it would have been useless from rust in a year. Mills sent it to the arsenal at Fort William, the normal procedure with impounded arms, saying how he had obtained it, on which they sent him a statement to fill in to show who had issued it!

Chūrāngchū had a great weal across his face where he "ate" someone's dao some years ago, but I gather he gave rather better than he got. Besides Anangba and Chongtore the gaonburas of Lirisü, Phirë, Houpu ("Longtāk") and Khumishe came in, and Mongko of Tüensang to ask for the measurements of our camping ground so as to make preparations.

Some one, Churangchu I think, brought me in here a huge chunk of Sangtam toffee—really magnificent stuff (Mr. Pawsey is my witness, he ate it till he broke a tooth)—made by mixing in the flour of maize, or better still of "stinking dall," with boiling honey and keeping it on the boil till solid. It tastes very good but is exceedingly hard.

Chārāngsü of Mangaki, an ex-interpreter, went back from here, having been quite useful in the Sangtam villages. I took on two Sema volunteers as "tikka-coolies"—men of Khūmishe wishing to see the world. After dinner Churangchu and his men danced, and very well too with the most scientific footwork. Best of all was the dance imitating the hopping of crows searching for food.

9th. To Kudeh, about 9 or 10 miles, but exceedingly steep going. First dropping down to the Chimongchi stream, then up a very steep slope to the top of the Matong ridge, down again to the Chenyak stream, and up to Kudeh-6,712—probably down 3,000 ft. and up 4,000 in the day's march. At Kudeh it really felt like the cold weather at last and was very cold after dark. The village is small and utterly without discipline or any sense of co-ordination, and the inhabitants very reluctant to do any work for us, and no one really able to get himself obeyed at all.

Men of Chongtore and Sontak carried our loads and came on exceedingly well. It is said to be the first time that Sontak men have ever carried loads for anyone but themselves. They have the reputation of being a very stiff-necked village.

At the top of the pass over the Matong ridge the villagers of Chongtore and Kudeh had combined to clear the path and had put up wooden signs. Chongtore had merely a row of sliced sticks representing the number of men who had helped in the work, but Kudeh had carved theirs into hornbills' heads (very rough) and figures of men. In a *morung* at Kudeh I noticed wooden hornbills hanging up by strings and was reminded at once of the wooden hornbill hung up in a *durbar* building by Borneo tribes at a function described by Hose and McDougall.¹

Men of Ngāmpūngchi came in with a salaami pig, and villagers of Kuthūr, sent to find out the news. The Ngāmpūngchi gaonbura, Wongtho, got his medal for going to France.

10th. To Tüensang. There was some delay in getting off, as Kudeh could not give us enough coolies, and they had to come from Tüensang, 7 miles away. However we got off by 8-45. The path was very good and well graded and we reached Tüensang (Mōzungjāmi) by 11-30, crossing first one of its tributaries and then the Yungyang stream, which is one of the principal sources of the Yangmun river.

Tüensang received us very well, and Yālī, Longtāng, Nākshō, Hāk, Phāmpāk, Lōgōng and Chingmirēm, all Chang villages, sent in men with salaamis. Chingmāk of Chingmei (Pl. 14, fig. 7) also turned up. We found an excellent camp cleared and fenced all ready, thanks to Mongko of the Bilaeshi *khel*, who was an interpreter in Mōkōchung for a time when I was Sub-Divisional officer. Alders are grown here, and the seed is said to have been obtained from Āngfāng in a raid. The Bilaeshi *khel* is a crowded village of about 200 houses or more with very narrow streets, the front gables of the houses hanging right across the street alternately from opposite sides. Half of this *khel* is of the Chongpo clan, and the other half of the Ung, the latter clan being part of a Konyak village which split up after defeat by Tōbū, the other half going to Āngfāng. The quarrel with Tobu was started by Tobu and the other villages having a contest to see which could ring a hill holding hands all the way round. Tobu's opponents held winnowing fans in between each man and the next, so that they looked like men at a distance, and doubled the length of the line, a deceitful act which annoyed Tobu, who tried to ring their hill honestly and failed. The enmity between the Bilaeshi *khel* and Tobu still continues.

Āngfāng is noted for its trade in cowries, which are there rubbed down to a rectangular shape, so as to lie flat on the cloth, as is done at Khonoma in the Angami country. The untreated cowries are said to reach Āngfāng from the Burma side. That village was visited by us in April 1923. Drum-logs are kept in the Tüensang *morungs*, which, however, do not seem to be used as sleeping places. The corpses of the Ung clan are put on *machans* with double-horned thatching, imitating a pair of buffalo horns, as in Ūrángkōng and in some Konyak villages, I think, where a pair of buffalo horns is a common fertility emblem. Here too, I noticed a rough stone phallus tied to the front post of a house. When I asked what it was they

¹ *Pagan Tribes of Borneo*, II, p. 298, pl. 206.

grinned and would not explain. In one of the Bilaeshi *morungs* too, I noticed that the heads were hung close to a wooden figure, carved to represent a man in a condition of sexual excitement, while a *morung* in the Kangsho *khel* had figures of women similarly made. The *morungs* also had wooden hornbills suspended in flight as at Kudeh.

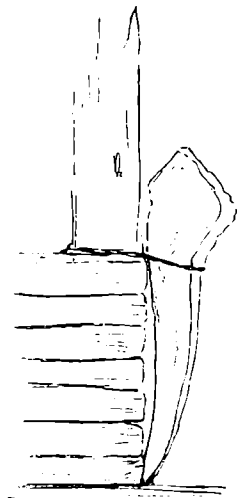
11th. Halted Tüensang. In the morning I visited the village and saw the rest of it. It must be quite a mile long with a few blank spaces but nearly all one long main street with small and crowded side streets wherever there is room along the ridge.

It is one of the biggest Naga villages I have been in, and must have about 700 houses. The people were most friendly, particularly the women who crowded round our mad piper and laughed uproariously at his buffooneries. That piper is a political asset, and the music drew the population out in scores.

The village had started a dance last night at 9. p.m. and it was still going when we started up to the village at 8-15 a.m. (Pl. 13, figs. 2 and 6) and though it stopped then, fresh dancing broke out in each *khel* as we went through. It is the usual circular dance, only in some dances the women join

in and men and women dance together holding hands in a circle which gradually winds spirally at the end of the dance and then undoes itself by the wind up starting at the other end and going the other way. There is a sort of jig step which goes on all the time, and it is tabu not to finish properly any song once begun. The men's dance goes round deasiul, and that with women in it goes round withershins. Many of the men were dressed out very elegantly with make-shift tails of white fibre spreading at the bottom like a skirt and with make-shift helmets of shiny bamboo spathes. The women had their hair down their backs, and carefully combed. I was surprised to find many of them quite pretty in spite of the ugly Chang tattoo. Some of them had quite refined and even aristocratic looking features, as have many of the men, though nearly all are inclined to be prognathous. In the Kangsho *khel* I noticed a dog with one foreleg tied up to the neck as a punishment for theft. The dog did not seem much inconvenienced. Another dog—a white bitch—was being shaved with a dao, the hair to be dyed scarlet and used for embroidering clothes.

In the Lōmao *khel* there was a buffalo-headed drum just like those of the Aos, and many *morungs* had carvings of leopards biting each others necks,¹ clumsily carved. One of the headmen's houses had a one-piece wooden bed, which must have been cut, legs and all, from an enormous tree. I saw an old man who had devised for himself a new type of cloth "to keep the cold out." It was a white cloth with lines of cotton fringes in different colours.



Stone Phallus tied in front of a house in Tüensang.

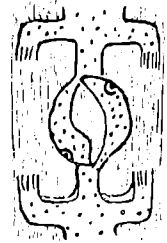
¹ In other villages I have seen similar carvings without the spots, and, I think, with two eyes, described as martens.

At the edge of the Lōmao *khel* was a fairly fresh head recently taken from Ninyām and not yet ripe for hanging in the *morung* in front of the drum. (The *morung*, by the way, is not used as a sleeping place by Changs.) The eyes of the skull were pierced with bamboo skewers "to give the spirit pain in the next world." Behind it the fingers and toes of the dead man were strung together and hung on another pendant. They were not complete however, as the owner had been some short before his head was taken.

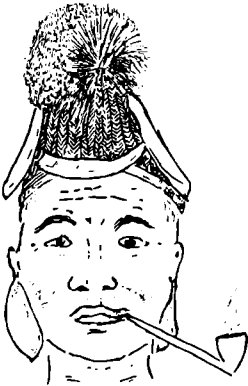
In between the Bilaeshi and the Chōngphō *khels* there is a deep ditch digged, formerly filled with 'panjis' most of which were pulled up by Ongli Ngaku's orders last time he came here, when he tried to settle the long standing feud between the Chongpho and Bilaeshi *khels*. For the present it is abated, but I saw in the Chongpho *khel* a long row of hide shields set out as they are put when trouble with the Bilaeshi is toward. I noticed an occasional stone erected, but small, and apparently not of much importance. There was a dance going on in the Chongphō *khel* in which a warrior joined stepping into the middle of the circle, and shouting out the occasions on which he had proved his

valour. He was followed by two witnesses, as required by custom, to testify to the truth of his assertions, but these tended to become buffoons, the chief witness repeating "so I have heard" or indeed "indeed I have heard he killed a woman" or something of that sort after each assertion, and the witness No. 2 rarely saying anything, but when he did it was "yes" or "it might be so." Witness No. 1 caused great amusement by his remarks and doubtless would in time develop into a stage clown or the humorous relief in a serious drama for the catalogue of exploits was accompanied by a great deal of gesture, while the circle of dancers would make the chorus, choryphaeus being already in existence.

I should very much like to have seen the place where the skulls of the dead are put at their second funeral. At the harvest festival each year, the previous year's dead are dis-interred or taken from their bamboo platforms, as the case may be, (for both methods of disposal are used according to the last instructions of the deceased, or, failing any, by clan custom) and are taken to a spot about a mile away in the ravine of a small stream where there are natural stone shelves formed by the strata in the rock. Here the heads are set out in rows on the shelves allotted to each clan, the oldest being thrown away when there is no more room for the new ones. No path may be made or cleared to this spot, and no one may go there except when conducted by the two official buriers, and then no one may look about them or behind them but they go stooping with eyes

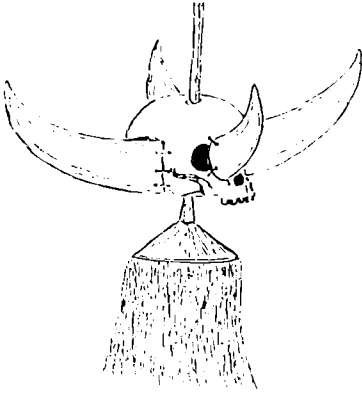


Carving in Tüensang of leopards biting each other's necks.



One of the Tüensang headmen.

on the ground. They were most obviously unwilling to take me or to let me go, so I gave up the idea. There are two such places, one for the upper *khels* and the other for the lower ones of the village, both a long way from the village itself. They could tell me of no other village with the same custom.



Skull-hanging in Chongpho clan of Tüensang. It was that of a man of Chingmei, who had taken 15 heads himself and had, as a young man, killed the chief warrior of the Chongpu clan. The skull was decorated with four horns instead of two.

A lot of the Tüensang people came in for medicine. There was a good deal of sickness, as some thirty men had gone down to work at the Borjan Colliery in October and were all ill as a result. The village is far from rich, and sweet potatoes seems to be the staple crop. There is a good deal of Job's tears, but it appears to be very poor this year and is said to be usually like that. I doubt if the poorer households often taste liquor.

The women have two face-tattoos, differing in the chin pattern between the Ung clan and the others. I got Mongko's wife (Pl. 12, fig. 6), a pretty girl, to come to the camp and let me paint in her tattoo and photograph her,¹ after which I presented her with some red wool. After that I was besieged with people wanting wool, and the perimeter was crowded with women, while the boys and men became a perfect nuisance, and were not at all disposed to be shoo'd off. While halting at Tüensang the surveyor went up to Nākshō, a small Chang village high up, on the same range as Kūdeh and west of the Yangmun. Naksho, he said, contained 57 heads in the *morung*, different men's trophies being hung on different canes. When a man dies the heads he has taken are hung up by the corpse (whether it is buried or exposed on a platform) and left there; at Tobu, on the other hand, they are said to be passed on from father to son.

The red goat's hair spear shafts so common here are made by Vāli and Longtäng,—Chang villages further west.

12th. To Hākchäng—about 9 miles. We had great delay in starting (we did not get off till 9 a.m.) and I was not at all sure that we should get off at all. The Tüensang coolies turned out well enough down to the last 20 loads, and we had to wait an hour and a half for these, getting them by ones and twos, with threats and cajoleries, and comings and goings, stampings, shoutings and the rest of it; Chōngpho and Kāngsho had carried from Kudeh, and it was the turn of Bilaeshi and Lōmao to carry. They had never done it before, of course, and considering that, it was not so bad. Indeed it was rather a triumph to get all our coolies out of Tüensang as we did. I decided to go on to Chingmei *viā* Tobu, as if I went direct by Kējōk and Kōnya it would be very difficult to get coolies for the second stage, as it was

¹ Like all my photographs taken in November it was fogged owing to an undetected fault in my apparatus, and in this case, as in most, so fogged as to be useless for reproduction.

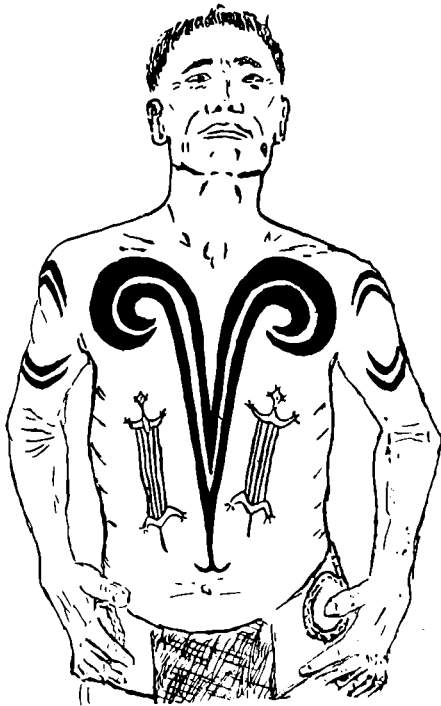
practically certain that Tüensang would refuse to carry for more than one day, and I did not want to have to call for coolies from them for a second stage and be refused. There was bound to be a difficulty in getting to Tobu, but they could at any rate supply the coolies to take us on to Chingmei if we once got there.

On the way to Hakchang we passed the site from which both Tüensang and Hakchang were founded; and Hakchang still speak the Chang language and wear the Chang tattoo, but in appearance and customs they are entirely Konyak, except that they do not shave the heads of their women as the neighbouring Konyak villages do. The Hakchang men cultivate a peculiar form of hair-dressing in which besides a tail of hair behind



Men of Hākchāng.

—usually knotted—they cultivate a straight lock in front coming right down the forehead, most of the men wearing hats or head bands. This style of haircutting is said to be the original Chang style, and is still resorted to temporarily in case of the repeated death of a man's children, the reversion to the old style being apparently intended to mollify the ancestral spirits. We crossed the Tüensang river on the way, and I noticed that again, as at Tüensang, erect stones were put up on each side of the river, while the approaches to the bridge, which was of bamboo, were built of stones.



Chang tattoo pattern.

Hakchang has about 200 houses crowded together on a very steep and stony spur (Pl. 14, fig. 1). There are hardly two contiguous houses on the same level anywhere. Rich men paint the frontal posts of their houses with tattoo patterns, daos, spear-heads, hoes, etc. in black, and cut oblique lines in twos and threes across the under side of their rafters. Women whose blood relations on the male side have taken a head may cook the head, with chillis, to get the flesh off, and then assume the male tattoo—the double ostrich-feather type worn by head-takers. Pots are made here with studs round the curve to keep the fingers from slipping, a very clever dodge,

and also pots with handles, I think, though these latter are mainly made in Tobu, where they sometimes add a handle to a studded pot, so that the studs become mere ornaments. Hakchang, we noticed, grew *euphorbia* trees though I could not

see that they were cultivated for any special reason, as they are in so many Konyak villages. Hakchang build latrines with pig-pens under them, and fatten pigs there for small payments. In Yonghong, where I noted a similar custom last April, the styes are all at the back of the *morung* under the back verandah platform, but at Hakchang they build separate latrines at the edge of the village, as some Ao villages do. They mentioned here that the Changs used to have a "bird" clan now extinct, or very nearly so. Probably it corresponds to the Hornbill clan of the Aos and Lhotas. The Kudamji or Huluk Ape clan of the Changs is also said to be gradually approaching extinction.

A deputation from Saochu, a Konyak village on the west side of the Yangmun, came in for the first time, to see us; also from Māksha, an offshoot of Hakchang as also Kējok, Kōnya and Ninyām, who are friendly with Tobu.

13th. Left Hakchang in fairly good time, the coolies turning out well, and started for Tobu *via* Māksha. The arrangement that had been made was that men from Hakchang and Maksha should carry us as far as the river which divides their land from Tobu, with whom they are very much at war, and to whom they have recently lost a number of heads. Here Tobu carriers were to meet us and carry us up to their village: this arrangement having been made for us by Chingmāk of Chingmei, who is friendly with both villages.

Hakchang had, as I noticed when passing out through the east door of the village, the familiar arrangement of thorny creepers on posts, to be cut down in war time so that the thorns are an impenetrable barrier, a plan followed by the Angami, Kacha Naga, and by the Wa of Burma. Maksha, through which we passed, has, I should say about 60 houses, and closely resembles Hakchang. I notice "buffalo-horn" pattern graves.

On our way down from Maksha to the river, the Ninyām gaonburas calmly told us that they had been to Tobu and that a fresh arrangement had been made there, and that Tobu, as they would be carrying our loads to Chingmei, would not come to meet us at all, but the Hakchang men should carry all the way up to Tobu; when we got to the Teithung, the Hakchang carriers, not unnaturally, flatly refused to go a step further. We were ready for them, however, and at the critical moment had them parked in an open space between the Teithung and its tributary the Moyung.

At first we tried persuasion, which was useless: then at Ongli's suggestion we quietly got sepoy all round the edge of the open space and then told them, (1) that they would be fired on if they bolted; (2) that they must carry, or the sepoy would "spoil" them. Luckily they did not call our bluff, and after another half hour of threatening, cursing, and coaxing, while many had their daos out, and all were either sulking or shouting, and looking rather nasty, we got them on the move across the river and up the hill. I was still very anxious, as the Ninyam people had reported that someone, obviously of Tüensang or of Hakchang, had been "dirtying our path," and there was a report about in Tobu that we had sworn to eat some village this trip, and the non-appearance of the Tobu men as arranged looked bad. However, they had cleared the path, and, when about half-way up the hill, two of the Tobu headmen turned up, much to my relief. It also re-assured the Hakchang men a little, though

we had a great deal of trouble with them before we finally got into camp just outside and below Tobu. There we let the Hakchang and Maksha carriers go after paying them in red wool—rupees do not run here—and they hared off down the hill in a scrum, daos drawn and shouting.

The approach to Tobu on this side consists of a narrow ridge about 25 yards broad, level along the top and with the ground falling away very steeply at the edges. It commands a magnificent view both east and west, and we occupied the width of it for our camp, an admirable position from every consideration. It had held, till the morning when we came, the body of a Hakchang man (who had been killed at the end of October in an attempt to raid Tobu)—minus his head and the lower part of his limbs, and impaled on a stake. This, they had removed for fear of hurting the feelings of our coolies. Several Hakchang men had tried to get heads off Tobu, and had been surrounded and killed. The path had been studded with stumps the whole way, and only cleared for our benefit. As the sides of the path and the adjoining jungle are “panjied,” anyone from another village ignorant of the by-paths in the jungle would have to use the stubbed path when escaping after a raid, and must sooner or later trip and fall. Anyway, he would be delayed long enough for the pursuers to get round and cut him off by paths only known to themselves.¹

The same path had shallow holes in places, which holes had held “panjis” covered with a false surface for the unwary to put his foot through and spike it.

As we entered Tobu, Ongli, who had had a relation lose his head to that village, had to perform a ceremony to conciliate the dead man’s spirit, as I understand, for his action in entering Tobu in peace, and being entertained at Tobu. A friend threw down for him a small dao blade, over which Ongli poured some liquor and muttered a speech, finally striking it with the iron butt of his spear and flicking it aside off the path, leaving the blade for anyone who might chose to pick it up, which the friend who had put it down for him promptly did. Even after this he was afraid to drink Tobu’s liquor for fear of loosing his eye-sight and his teeth.²

Tobu was disappointing in some ways. I had imagined it full of carving, and Woodthorpe’s account of the stone seats of the chiefs³ had misled me. The village is very large in population but does not cover a very big area. Several families live in one house and there are 16 principle *morungs* with many subsidiary ones, but the houses are not striking, and the *morungs*, are notable principally for the shape of their roofs which start low and curve upwards in a sort of horn pointing skywards (Pl. 14, fig. 2). There is very little decoration, and I fancy Tobu is too industrial to be artistic, and devotes itself to making pots, daos and cloths for its neighbours. As far as the carving goes it is like that of Yonghong and Yaktu, but I only noticed a single pattern of mithun head in use.

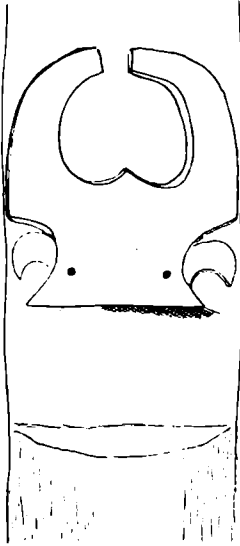
There were a few heads in each *morung* decorated with buffalo horns in the usual Konyak style, but no single *morung* held as many heads as the principal

¹ Cf. Butler, who reports the same practice among the Angamis in pre-administration days. *Rough Notes on the Angami Nagas*, J. A. S. B. 1875.

² Cf. *The Sema Nagas*, p. 130.

³ Vide my entry of April 16th.

Hakchang *morung* held heads taken from Tobu (Pl. 12, fig. 1). A *madar* tree (*erythrina*) in the middle of the village, had a bamboo lent against it from which depended a fragment of scalp attached to a cross-piece which caught the wind and swung in it, reminding me rather of the Sangtam method of treating enemy heads at Thachumi and elsewhere to the South.



Buffalo or mithun head as carved in Tobu.

The chief's stone seat was just an ordinary boulder placed at the top of a pile of smaller stones exactly like an Angami *Kipuchie* in Kohima village. Woodthorpe says that only the chief is allowed to use it, but it was crowded by all sorts and conditions when we came up. There are other stone sitting-places, like the chief's seat and apparently attached to a *morung*, which are made exactly on a common Angami pattern, only the scaffolding of the machan put up as an extension to the stone is of bamboo instead of wood. I gathered that the chiefs—there are more than one—are rather small beer. At any rate they have nothing like the position of the *Ang* in villages further North, and their houses are just like other peoples. The stone causeway with a culvert through that Woodthorpe mentions, still crosses a depression between two *khels*, but though higher, it is not as well made, as for instance, that at Ängfäng, nor nearly as long. I noticed **Y** posts here, placed as by Phom villages along the outer face of the house verandah. The dead are first disposed of on a platform covered by thatching in

a style resembling the buffalo-horn cover, only the roof is horizontal instead of curved up at the ends. For the second disposal figures of basket-work with their chests made of bamboo spathes painted with the usual Chang pattern, are set up in what I take to be family groups (Pl. 12, fig. 8; 14, fig. 5). These figures have no heads, but the neck and shoulders are surmounted by a hollow basket-work frame, the bottom of which is padded with cloth for the skull to rest on. I saw none with the skulls in, but presume the use of these figures is the same as at Ükha, which is one of the nearest villages. The women cut their hair close and keep it so for life, plucking out a triangle on each side of the forehead more or less clean but smaller in area than at Yungphong, Ükha and Yonghong. The small boys wear their hair in a narrow sort of cock's comb down the centre of the head very much like a Tangkhul, and are tattooed in a broad stripe down the nose and chin. The cloths are very finely woven, and finished off as Angami cloths are. I was warned off the site of a burnt house because it had been struck by lightning, and if I went there my feet would ache. I suppose if I lame myself to-morrow it will be put down to that.

Oranges are grown by Tobu, and I noticed flint and steel used, also the bark belts I saw further south in April, as well as the cowrie belts common to the southern Konyaks and the Changs. I was also struck by the resemblance of some of the Tobu basket-work hats, to those of the Igorot in the Philippines, and one I obtained had

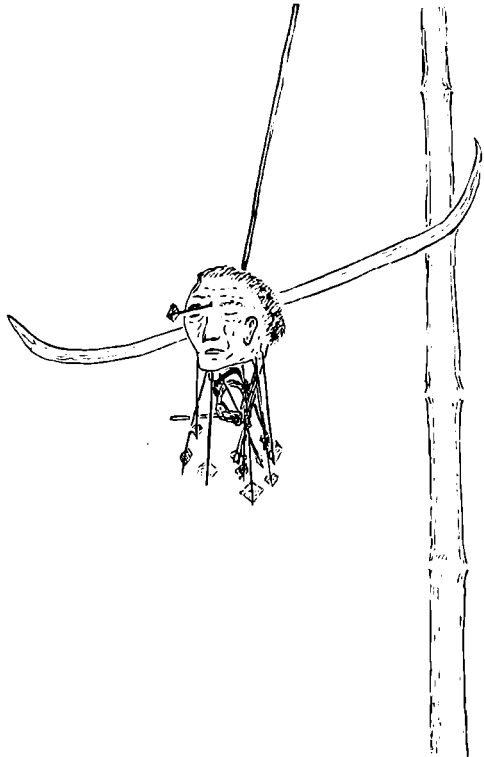
a sham hair knot with a bone skewer through it attached to the back. To save the owner's wearing a chignon, I suppose.

The general appearance and physique of the Tobu people compare most unfavourably with that of the Changs as a whole. Hakchang men are small, and un-Chang-like, but those of Tobu are miserable specimens, small, weak, and goitred. The women reminded me of the poorer type of Angami in Cheswema, Nerhema, Keruma and Tofima, where *panikhets* have never really superseded jhum.

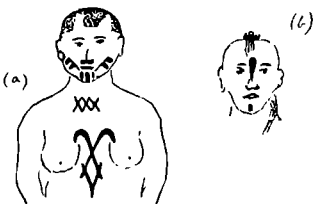
The Tobu word for man is Konyak, so that that word for the whole tribe is probably merely the word for man like the Lhota *kyon*.¹ Further North, however, the Konyak word for man is *shenyak*.

14th.—Tobu appeared this morning in its true colours. Would they give us coolies? Of course, only too delighted, three to a load to help us along the quicker, but by 8-30 not a coolie had arrived and I took a party up to the village. Here there was a continual chorus of "lolabu," "lolabu,"—"will come," "will come," but not a man started. It was the custom they said

to sit in the *morung* in the mornings till they felt moved to eat rice, and then after that they would carry our loads. Threats and imprecations had not the least effect at first, though after a time they gradually produced about one quarter of the number wanted, otherwise all the reply was "lolabu" and no one came. The village meant to go—some time, and each man hoped his neighbour would go first and he would escape having to carry himself. The "chiefs" have absolutely no authority and their orders had no effect at all, and when I threatened to burn the house of the biggest he laughed and obviously did not take it seriously.



Sema head from Nikiya village hanging up in Thachumi, 1921.



Tobu tattoo
(a) woman, (b) boy.

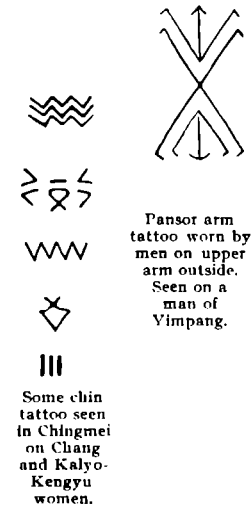
¹ Cf. also the oceanic *Kanaka*, which has, I believe, the same meaning.

Eventually we shot a big pig and went away. This produced a rush of coolies, but still not enough. Then I started to go back to the village; this was a mistake as it frightened them, and the women and children, till then present in crowds, all bolted and most of the men, so I turned back, but the remaining coolies were quietly produced and we got away at 9.30.

It was a long march, steeply up hill most of the way, and the Tobu coolies, who had eaten no breakfast were many of them physically unable to carry. Most of the *dobashis* and *gaonburas* with us had to carry a load for part of the way, but in the end we got to Chingmei about 5.0 p.m. very tired. I reckoned the distance at 16 miles, but it was a very tiring 16 miles for everyone. On the way we passed the deserted site of the village of Ungpang which split up generations ago into two parts, one going to form the Hāwang clan of the Changs, the other the Konyak village of Ängfäng. We crossed the *tila* at Waoshu, which must be 8,000 ft. up, or very near it indeed, a rather dismal looking village of scattered houses with the dejected look that always seems to go with villages at a great height. The inhabitants are mixed Chang and Konyak.

I was very much disappointed with the view from Chingmei. By the map we should have been across the main range between Assam and Burma, but the mapping is wrong and this side of the range does not drain into the Namzalein as indicated, but into the Zungki and so to the Ti-ho. Between us and the Namzalein there seemed to be two more ranges, the furthest of which seemed to be joined on to the Saramati range and to form the Namzalein-Ti-Ho watershed, though I fancy it is not actually as high as the range we had already crossed.

15th.—Halted at Chingmei. Pawsey and the surveyor went down to the Wokyung below the village, and thence up the range called Poupu (8,000 ft.), east of that, in order to map the sources of the Zungki, here called the Langnyu, at least from the junction of the Wokyung, coming from the Yimpang end of the valley, with the Tiekjung coming from the southern end towards Chentang. Unfortunately the day was very cloudy and they were unable to see much. I went to the village (a mile away) and then up to the top of the range behind, (the former site of Chingmei), from where I could see into the next valley a little, and was shown the villages of Längyok, Nöko and Sanglao. Clearly the map was wrong, and there was a range splitting off from the Patkoi and joining up with the Saramati range and forming the watershed between the Namzalein and the Zungki. It is along this range, probably that the Assam-Burma boundary will ultimately go.

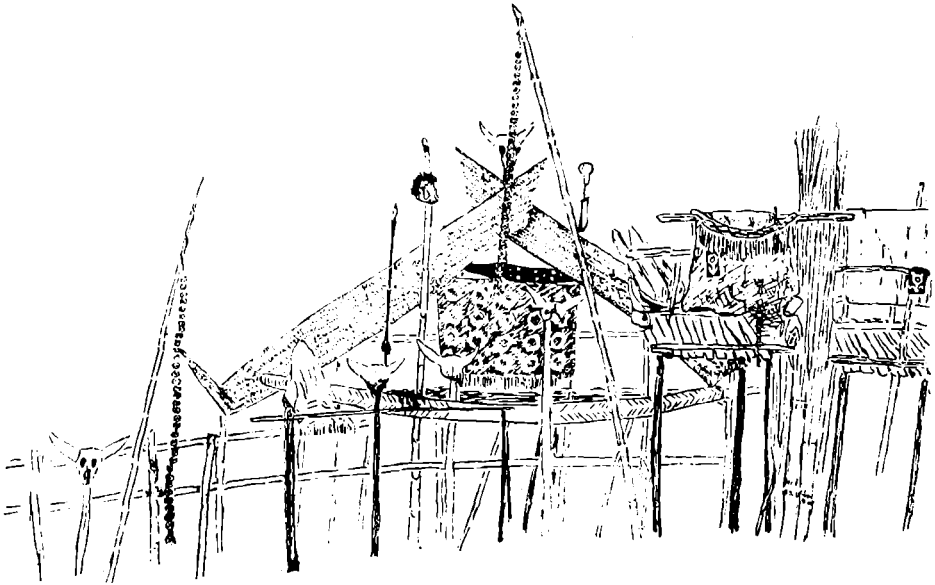


I saw a Khamti dao again, here, bought by a Chingmei man from Nöklök further east. One of the houses in Chingmei had plank walls and in general the side walls were a good deal higher than is usual in Naga houses,

adding much to the space inside. They make a lot of fibre cloth here, using the bark of a prickly shrub which bears small berries like miniature double raspberries along the stem of it. It is called *leikin* by the Changs.¹ I noticed plank-sitting places, and a small drum-log hollow at both ends, also a house half slated in the Kalyo-Kengyu fashion. A considerable part of the population of Chingmei is Kalyo-Kengyu by origin, and there is a tendency to take wives from that tribe, which regards it as improper to ask for any marriage price. The dead here are buried under a stone. Later the skull is disinterred, cleaned, and reburied at a little distance from the body, a custom which, I believe, is generally followed by the Yimtsungr. In Chingmei, persons killed in war and decapitated are thrown into the jungle and their property is put out for them nine days later. I also saw the "inverted chevron" memorial mentioned by Woodthorpe as seen by him somewhere



A helmet seen on a man of Yimpang.



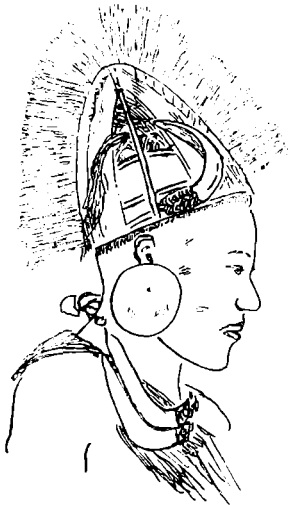
Memorial to a chief of Chinghori, representation of the rainbow, skulls of the cattle slaughtered at funeral, clothes, ornaments, utensils used by the dead man. Tallies of head taken, etc.

else in 1875-6.² It is said to represent a rainbow, and to be symbolic of the rain that always falls when a really great man dies. It was accompanied by a great array of clothes and ornaments, and by a long row of Y-shaped posts and the skulls of slaughtered cattle, all in memory of the recently dead chief. The chevron does

¹ Mr. N. I. Bor got it identified for me later as one of the *Urticaceæ*—*Debregeasia velutina*. It is used in South India in Wynaad and the Nilgiris for bow-strings and in Ceylon for cordage and fishing lines. It is perhaps also used in Kumaon, Garhwal and Nepal, *vide* Watts, *Dict. of the Economic Products of India. s.v. Debregeasia*.

² Woodthorpe, *op. cit., v. supra* under April 15th.

not really look a bit like a rainbow, being angular and the two sides crossing at the top, and having a sort of foot sticking up at each end, but it struck me that it might have something to do with the passage of the soul to the next world, as I think the rainbow is called "the spirit's bridge" by some Naga tribe and the Semas also call it *Kungumi-pukhu* which one translated as "sky spirit's leg," but *apukhu* means bridge as well, and the latter is a much more reasonable translation.

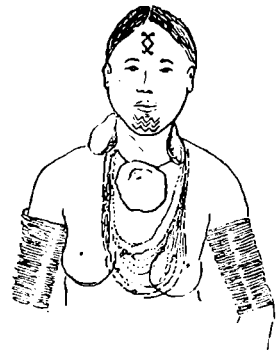


A warrior of Chingmei.

Shields of the bark of the sago palm (the edible variety) are common here, and I remember to have seen them also at Yungya, in the Konyak country and at Gwilong in the Kacha Naga country. I have seen them somewhere else in the Chang country on this tour, either at Tüensang or at Hakchang. The Changs of Chingmei are great cattle owners and the land has the jhumed out appearance of the Tizu valley—largely as the result of the great number of mithun and buffaloes kept. These are always being shot with poisoned arrows by raiders from "Aoshed," *i.e.*, Panso or Pansorr, a Kalyo-Kengyu village to the east reputed most formidable in war. They had a head off Chingmei only ten days ago, taken in the fields only 300 yards from the village and

we were given all sorts of warnings against them and had several broad hints as to the desirability of our going and slaying them and burning their village. One of the Chingmei chiefs apologized for his mean house on the ground that as Panso had burnt him out three times already it was not worth while building anything better.

16th. To Chentang, about 15 miles, going up the Tiekyung valley and over the pass between the main range and the Yakko range at right angles to it, and then down the valley of the Shetche the other side. Chentang is at war with Sangpurr and had caught and killed two Sangpurr raiders last month. One head they sent to Panso, the other head was hanging up on a "madar" tree (*erythrina*) together with the hands and feet of both the raiders (Pl. 15, fig. 7). This war with Sangpurr was most inconvenient as I had given out generally that I meant to go to Sangpurr which had several times invited us and which we had been told was certain to be friendly. Now one of the Kuthurr Headmen who had been there to warn them of our coming was sent back with a message that we were not wanted and the path would not be cleared for us. Obviously therefore we were not likely to get coolies out of them to go on with if we did go, yet I could not accept an order to



A girl of Chingmei.

turn back, so I decided that I would halt at Chentang and take 30 rifles and visit Sangpurr returning the same day. Indeed, without going on to the Sangpurr ridge it would be impossible to get a proper idea of the geography of the neighbourhood.

I saw more of the bark shields in Chentang, and a house partly roofed with wooden planks, but the village is small and poor and with some difficulty keeps its end up against Sangpurr. It was stiff with 'panjis' in all directions.

17th. Halted and took 30 rifles and visited Yakko and Sangpurr villages, a long and tiring day. It was about 7 miles to Yakko—down to the Shetche and then a very steep climb up, and I suppose another mile or more to Sangpurr, of which Yakko is an offshoot.



A Chang youth of Chingmei showing a face tattoo done for him in Tobu.

Yakko received us with reserve, but amicably on the whole, and professed a desire for friendly relations. We left the surveyor at work with four rifles to look after him and went on to Sangpurr proper. Here it was all but a matter of firing on them. They had removed much of their stuff (we did not see a single pig) and the men were gathered together with spears, bows, daos and shields. While we were out of sight between the two villages they were seen by those left in Yakko to be dancing about and brandishing weapons, but this subsided when we reached them, and all they did was to sit about looking very sulky while we made a tour of the village, but if it had not happened that we had to wait, before entering, for Chingmak to do a ceremony such as Ongli did when entering Tobu,¹ which gave a Kuthurr *gaonbura* time to run on and dissuade them from fighting, they would otherwise have certainly tried to put up a fight and we should have had to fire on them. As it was, one old man sitting in the street as we went by offered a thimble-full of *modhu* and two eggs and said that that was all he would give us unless we would destroy Pansorr the next village to the east, and that otherwise he would have nothing to do with us. I was vastly minded to put on him a pair of handcuffs we had with us and leave him so, saying he could wear them for my sake and come and have them taken off when he had acquired a sweeter tongue, but he was old, and it was hardly worth the value of the handcuffs.

We had been followed up to Yakko and Sangpurr by a train of 20 to 30 bucks from Tüensang and Chingmirem who had appeared very curiously at Chentang the night before, scenting trouble and possibly having had a hand in preparing it. I confiscated all their daos and said I would give them back when we reached Kuthurr next day, to which they should carry some of our loads, since they so loved our company. We had a wonderful view from Yakko village and saw three villages on the range running south east from Yakko mountain—Alam, Youkhao

¹ Cf. p. 53.

and Pansorr (the rumoured "Aoshed"), and two more on the range behind, Sanglao,—also seen from Chingmei—and Poi. The river dividing the Alam-Panso range from the Sangpurr range is called Tsöhyemung, and runs, like all the rivers here, into the Zungki and so by the Ti-Ho to the Chindwin.

Sangpurr seems always to be at war, and there were many heads hanging up in



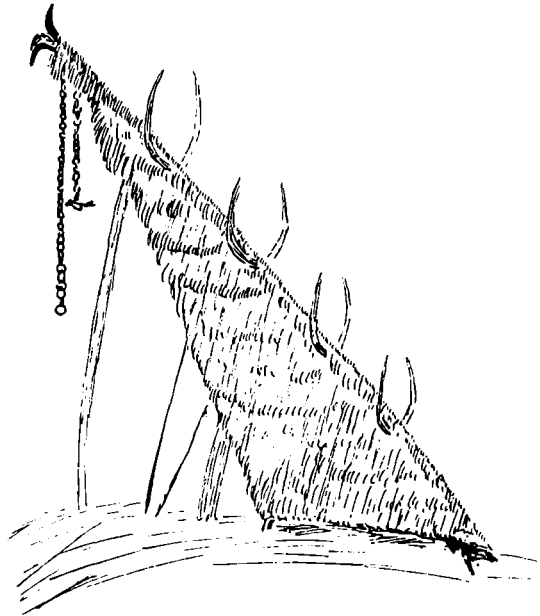
Yimtsung drum (Sangpurr) with open ends.

the village, hung on bamboos, as at Chentang, where they are left to rot away and drop, as is the Sema practice.

The houses have plank walls, and the drums are of a type

more or less new to me and hollow throughout, the ends not being closed at all. Some of the houses have roofs of huge wooden shingles, each several square feet in area, and I noticed one head stuck full of arrows and was told that it was that of some old enemy against whom feeling was bitter. In some *khels* the *morungs* seem

to have dwindled to a mere gable, with a miniature platform at the back on which no one could possibly sleep, and which were not even deep enough to house the miserable little drums in front of them. I noticed no tattoo on the men; the women were in the jungle or on the outskirts of the village. The *modhu* was very thin and I fancy the village is poor.



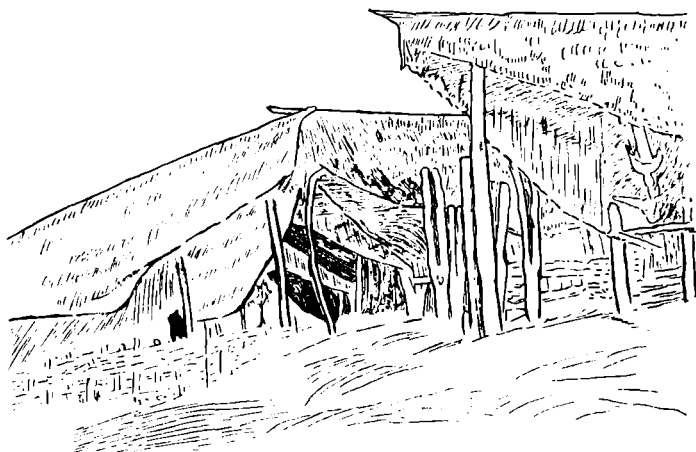
Yimtsung Moruug (Sangpurr).

On the outskirts of Yakko I saw two shields and carrying baskets with stones in them, and upturned gourds on sticks put outside the village towards Chentang to call the souls of the two men who died there the other day. The stones were put in to remind them of their native soil, and so induce them to return.

In the evening as I was sitting over the fire rather congratulating myself on having had no need to open fire at Sangpurr, a man came in to say that the *gaonbura* of Chingmirem and his two sons, who had followed us up to Sangpurr had not returned. The situation was discussed by all the Nagas, and he was found to

have been last seen entering a house in the least friendly *khel* of all. It was decided emphatically that all three men must be dead. I felt a little doubtful, but thought that they knew better than I, and decided we must go back to Sangpurr in the morning. I took no responsibility for them and they had gone against my orders, but Sangpurr did not know that they were not of our party. The probability of their death was clinched by the surveyor having seen from the hill where he was working, the middle *khel* waving their daos, dancing and shouting after we had left, which left practically no doubt that they were dead. Obviously there was no choice but to go back to Sangpurr and find out.

18th.—We started out at 7-0 to go to Sangpurr in wrath and had crossed the river and were well started up the horrid climb when the missing man and one son



Kuthurr village.

turned up. As they ought to have been there with their coolies at Chentang they got well beaten, and we sweated back up the hill again to Chentang and thence started for Kuthurr, packing up camp and getting away at 9-45, which, considering the delay, was very good work. The Tüensang corner-boys did their share of carrying and did it very well. We got up to Kuthurr, about 8 miles up-hill all the way, by about 12-30. It was not a very interesting village. The granaries, like all those of the Changs and of the other Yimtsungrr are protected from rats by round discs¹ of wood on the poles just under the floor. The houses are frequently walled with planking, and sometimes roofed with the same huge wooden shingles as we noticed at Sangpurr in the case of rich men's houses. No particular ceremonial status is necessary, however, as it is in the case of the Angami who wishes to have a shingle roof. The women have a curious way of doing their hair. An ordinary knot

¹ Cf. McGovern, *Among the Head-hunters of Formosa*, pp. 176 sq.; Peal, *On the "Morong," etc.*, J.R.A.I., XXII, p. 251 and pl. xvii. Peal gives the distribution of this disc as "Assam, Formosa, New Guinea, New Britain." McGovern adds the Aimu.

is made at the back with a rather long loop of hair sticking out straight behind, and then the knot is turned over and tucked in which brings the loop over so that it stays pointing forward over the left ear.



Yimtsung woman's coiffure
(a) down, (b) 1 and 2 Up.

Yimtsung-Awenrr. The forked posts erected have a lozenge pattern on the front, suggesting the white star on the forehead of a mithun, and are high and narrow with a short stem.

19th. I regretted that I had not taken more drastic action at Sangpurr, as the effect of my long suffering was that Kuthurr and Chingmirem considered it entirely unnecessary to turn out coolies. Chingmirem, who were told to supply 40, sent 11 and we had to shoot pig in Kuthurr before we could get enough coolies to leave at all; when we did, I sent Pawsey with the column direct to Yimtsung-Awenrr and went myself with 10 rifles to Chingmirem to fine them for not turning out coolies. From Chingmirem (about 3 miles from Kuthurr) I went on to Shotokurr crossing the streams Chämyung and Kānglok a little above their junction, and then up a very steep climb. Shotokurr was the first village I had been into, which had been visited before, since we left Tobu. Mr. Dundas slept at Shotokurr when he went to punish Ayepongrr, a now deserted site two or three miles down the spur below Shotokurr. At Shotokurr I enjoined them straightly to send me coolies that night to carry next day, and so left for Yimtsung, leaving behind Ongli and the Ao *dobashis*, who were going back to Mokokchung. Altogether I reckoned that I covered at least 16 miles and it included some very stiff climbing. Yimtsung, which I reached about 5 P.M., proved a very pleasant camp on open turf. I find that the name "Yachungrr" is a Sangtam name apparently, and the Yachumi themselves call themselves "Yimtsung," Yimtsung-Awenrr being the original home of the tribe. Between Chingmirem (a Chang village) and Shotokurr (Yimtsung) I noticed one small erect stone in a field of Job's tears. I also noticed two small menhirs in Yimtsung-Awenrr itself; but generally speaking the Yimtsung tribe does not go in much for stones. Among the Job's tears I also noticed young alders, and they told me that they were carefully planted and preserved to improve the soil. The ones I saw were seedlings growing quite well in the shelter of the stalks of *coix*.



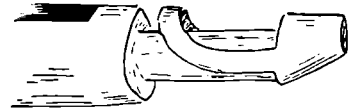
Yimtsung—"Y" post.

From Yimtsung-Awenrr there is a wonderful view up (or down) the valley of the Tita and of the upper waters of the Zungki. These two streams rise from a marsh in the middle of a narrow and very straight valley with steep sides and flow

in opposite directions only to meet again far lower where the Tita having joined the Tizu unites with the Zungki to make the Ti-Ho.

20th.—Shotokurr, of course failed to produce coolies, at least only 15 arrived, and as it was 8 miles in the wrong direction I did not go back to deal with it, leaving the Sub-Divisional Officer to do that from Mōkōkchung. The Yimtsung *gaonburas* seem to have very little control over their villages. However, we got enough coolies with the help of the villagers of Cheshorr and Yimtsung-Awenrr, and started for the village, known as Kitsü to the Semas, and to itself as Kyütsükilong. It is a small Yimtsung village on the high point south of Shipungr, and to go there necessitated a climb from the river below Yimtsung-Awenrr of 4,500 ft. On the way we passed

Shipungr which I entered to have a look at. While in the village half the coolies bolted. Luckily they could only bolt either down the very steep and narrow path by which we had come, which was blocked by the rear-guard, or into the village where I had half a dozen men and a couple of *dobashis*.



Drum head (conventionalized buffalo) in Shipungr village.

We saw them coming and 'shikared' them with horrid threats back to their loads. It was a very long pull up, again and the wretched coolies had brought no food with them. Probably they hadn't much to bring, and they kept lying down and saying they could not go on, but eventually we got camped in close to Kyütsükilong on a very high cold spot at 7,450 ft. The village was very friendly, and some of its inhabitants had been to France. I was surprised to see a Sema village (Hutami) on the range east of this, and all mixed up with Yimtsung villages.

It was very cold indeed at night, and Pawsey was down with fever.

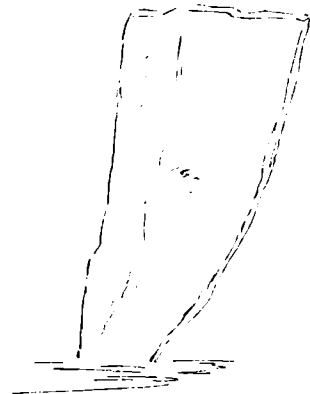
From Yimtsung-Awenrr to here, as also, I think, at Chingmirem and Shotokurr, I noticed small patches of rice grown here and there in low elevation jhums as a luxury. It is said not to be filling enough for a staple food, and probably does not grow well enough at high elevations. In any case it is said to be quite a new thing about here to grow rice at all. Yimtsung-Awenrr had some very nice looking bearded rice with a big blackish husk—the husk was yellow with black ribs and beard, which they said was a recent importation from Pansorr (Aoshed) to the east, and a very good variety.

21st.—To Shothumi, about 7 miles; water bad. No trouble with transport as the coolies turned up very promptly, being half Semas from Shothumi itself. Camped again at over 7,000 ft. and very cold. The old quarrel between the two *khels* of Shothumi is on. Woziya refuses to pay the customary leg of animals killed to Khuvetha who in turn refuses to admit Woziya's right to any land of his own. It is as much Woziya's fault as Khuzhokhu's I fancy, and any way all their land was grabbed from Shothurr and Hoñroñre.

A case came up of a head-taking dispute between Zukishe of Phesami and the village of Cheshorr. Two men of Cheshorr went to join some Phesami friends in sneaking a head from Hoñroñre. Apparently it was not an official Phesami raid and was concocted privately. The two men of Cheshorr in fighting kit-shields, spears,

'panjis,' etc., fell in with some other men of Phesami who thought it was someone coming to raid them and turned out to cut them off. Yazathu, Hoñroñre and other villages round about joined in the pursuit and decapitated one of the two adventurers. The other, too exhausted to speak, happened to run into Zukishe's son, whose companions were for killing him at once, but the young man prevented them and took the survivor home and let him go. In return for this Zukishe claimed, and got, a mithun from the man of Cheshorr. Now, however, Cheshorr have come forward with a claim against Zukishe for having treacherously enticed two of their men to be killed by his villagers, and demand the mithun back. Their statement that Zukishe himself invited them is based on alleged statements made in his village by the dead man only, and I do not think they fit in with the fact that one man was saved. Any way they are incapable of proof, and even if the statements were made they may not have been true. Sittobung and Hezekhu tried to settle the case on the lines that the two men of Cheshorr went out for war, and got what they were looking for; the mithun was rightly paid as the price of preservation, and the matter should end there. Cheshorr refused this solution and referred the question to me, saying that they had a *casus belli* and wished for war, and intended war. I said that they had better have what they wanted, but that the war was to be limited to Cheshorr on the one side (about 500 houses) and the four Ghovishe brothers—(about 400 houses, I fancy) on the other; and that Kyutsükilong and other inoffensive villages were to be left alone unless they joined in of their own accord. Kyutsükilong is to flag the boundaries of its fields, which march with Cheshorr this year. Both sides agreed to this, and I said there must be 10 days' truce before the *kātākātī*

started, but that it should be open from December 2nd. I doubt if anything more will come of it than a state of war and perhaps a few odd heads. Anyhow I fancy the only proper way of ending head-hunting, if it is to be ended, is by very gradually limiting its scope, until it gets rarer and rarer and the taste for it dies a natural death. Zukishe, I understand, is very unhappy about the fine he paid last year. It was a very heavy one, and has, as he put it, "taken all the meat off his bones." I noticed at Shothumi a smallish erect stone put up by a Yimtsung inhabitant "because the stone was a nice one." People had sharpened their daos on the top of it.



Stone put up by a Yimtsung man in Shothumi because it was a good shape.

I managed to get Zukishe, Hovokhu and Zhetoi—all notorious lycanthropists—to talk about the subject in Khuzhokhu's house. Zukishe, to a chorus of assents, stated quite definitely that the peregrinations *en tigre* always took place during sleep and that more often than not the country was strange and distant from their own village, but that *sometimes* they happened to kill near home and then only were able to indicate to others the

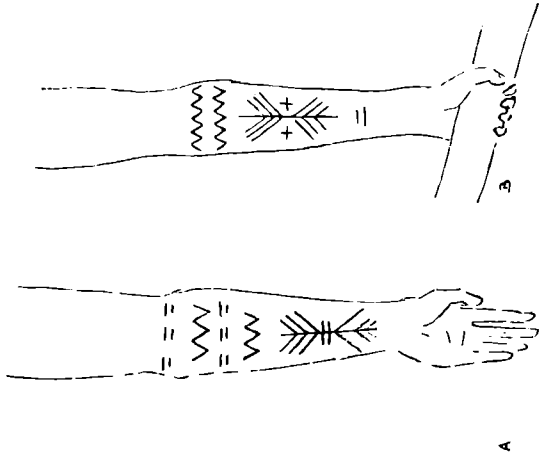
locality of the kill after awaking. Some are better at this than others, and I gather Zhetoi has achieved notoriety that way.

22nd.—To Rishetsü, a Säng-täm village, 6,800 feet, about 10 miles, where we camped on an old village site on the ridge after a severe climb. Water scanty and distant. On the way we passed through Hoñronre, (4,200 feet) where they gave us a pig. I told them to cut this up and distribute it to the assembled headmen, a large and heterogeneous company. A man of Phesami took hold of the pig's head for Hovokhu, his chief, to cut off, and insisted on Hovokhu borrowing his dao as being a better one than Hovokhu's. As the blow descended the blade flew out of the haft and chopped off its owner's three bigger toes of one foot, absolutely clean. Our doctor sewed them on again.

At Rishetsü, the villagers of Purrorr, Rürür, Anahatorë, Sanchorë ("Chashomi") and Phelungrr came in with small presents, and the chief man of "Lakomi" or Sirichu turned up likewise. I punished this village a year or two ago for the murder of a British subject by his son whom we never got hold of. I refused his *salaami*, and said that unless his son was produced and surrendered I would punish it again at the first convenient season. He promised to bring his son into Kohima, but probably won't. Any way his village is conveniently near the district boundary and is very insignificant. With the possible exception of Phelungrr these villages just mentioned are all Sängtäm; Phelungrr is probably Yimtsung or Kalyo-Kengyu, or of mixed origin.

Still above 7,000 (7,111) and a bitterly cold night. In our camp were the posts of one house of the village that had stood there—three enormous trees cut flat and with a mortice at the top for the roof-tree. I have not seen anything like them extant in the Sängtam villages here, which are all dirty, insignificant and hovelish.

23rd. To Kishethü, about 7 miles, a really good village that got a magnificent move on when making camp for us. Sirirë failed to produce the coolies ordered but the chief man turned up with a request for a red cloth and said they would send coolies when we came to their village itself, I put him in the quarter-guard and took



- A. Tattoo worn by Sängtam warriors of Hoñronre on both arms.
 B. Tattoo worn by Sängtams of Kishethu on left arm only. This pattern was copied from the arm of a Sema who had turned Sängtam and had himself tattooed.



A Sängtam; chief of Sanchorë.

him to Kishethu where I held him to ransom for a fine of five pigs for not giving coolies. I got my pigs and let him go, and then gave him his cloth. I gave four of the pigs to Rishetsü, Sanchore and Anahatorë as they had to supply extra men, and were all small villages and only did so with difficulty. Our red wool and salt was finished on the 20th and since then we paid in cash at $-\frac{2}{-}$ a cooly. Thachumi apparently accept cash for salt hereabouts.

Looking from Kishethū up the Zungki valley it is easy to see how the mistake on the map arose. It looks exactly like one long valley going out to Burma, and that, no doubt, caused the one who made the map to show it all as one of the sources of the Namzalein. As a matter of fact there is a very low saddle crossing it, which the surveyor could see (from Sangpurr, I think), south of which the valley drains into the Zungki. It is this saddle, and the high range which holds it, that must ultimately form the Assam-Burma boundary.

Kishethū is a village of about 100 houses with a reputation for looting traders of their goods. I noticed that they hung heads on bamboos about an *erythrina* tree as the Yimtsung do and as the Chang village of Chentang does, but the Kishethū golgotha had no fresh skulls—only some old gourds which doubtless once contained

"meat". Close by was the remains of a *morung* reduced to two roofless posts (with a separate hovel for the boys to sleep in), the front post well carved, decidedly in the Lhota style (Pl. 15, fig. 2). The drum, they said had decayed. I noticed a number of $-Y-$ posts, quite different to the Sema or Yimtsung pattern, being long in the stem and with spreading incurved arms, but although it was a genuine Sangtam village, some of the houses had house-horns admittedly copied from the Sema pattern. I noticed here an ingenious dodge of swinging hooks hanging loose on the hearth to take the four corners of a tray for drying meat, the hooks were made of a pierced node of bamboo with part of a shoot cut off to make the hook, and the nodes were suspended on canes passed through them and knotted. There were also some very



Hook for hanging up shelf over fire. Kishethu.

nice two-pillared stools, cut from one piece of wood.

Between Tobu and Kishethū—i.e., since the 13th—we have been in villages hitherto entirely unvisited, I believe, except for Mr. Dundas' halt at Shotokurr (in which Mr. Dundas slept when he went to punish Ayepungrr). To-morrow we get back into known and fully surveyed country. It will be rather dull, but it is something to have gone through the new part without any permanent transport and relying for our coolies on unvisited villages.

24th. *Via* Yazuthu to Yezashimi, about 11 miles. A stiff climb to Yazuthu from the valley below Kishethū and two very steep descents, one from Kishethū and again another from Yazuthu. We camped by the Tsütha river just below Yezashimi which is about 500 ft. above the river and 200 yards or less distant in a direct line from it, the path zig-zagging up the almost precipitous slope. Before we started the Lakomi headman offered me a mithun, but as the mithun had done no murder I refused it and demanded his son instead.

Men from Nitoi and Shietz came in about their land dispute. They don't want to fight and asked me to send a *dobashi* to settle it. I said that I would send a *dobashi*, but that if they afterwards rejected his decision or failed to observe it, I should take no action, but mention to Gwovishe's sons that the road to Shietz was still open if Shietz was the offender, and to Thachumi that Nitoi had hurt my feelings, if Nitoi transgressed. Both parties asked for the interpreter Kohoto to fix the boundary. Chekiye of Lukami came in, and Zukishe of Phesami again. Also the Cheshorr elders. They do not want war, and Sittobung and Hezekhu patched up a peace on the *status quo* lines. The only man who wanted war in Cheshorr was the father of the boy killed. The rest agreed that it was his own silly fault. The survivor was apparently protected from the village who wished to kill him, by Zukishe's putting over his head a corner of his red cloth received from the Deputy Commissioner. Tōōtso of Kitangrè came in for a cloth, and I told him I would give him one if he came to Kohima for it, but that I still wanted Tsichimu of his village, who escaped from custody in 1921 and has never been caught. He said he could not possibly bring him as he had sworn to kill anyone who tried to, but I said that the matter had by no means escaped my memory and that sooner or later I should come his way again.

The villages of Kōsanasāmi and Lhōshyepū are preparing war. They have a pretty land dispute to fight about and may just as well let a little blood and settle their differences. It will not amount to more than a riot, even if it ever gets as far as that. There is a similar dispute between Yangpirè (Yatsimi) and Mongrè.

Yazathu has a log-drum much like that of Shipungrr and the remains of a *morung* with a carved front post (Pl. 15, fig. 4). Into this post was stuck a small piece of iron—a fragment of a broken dao—"to prevent it being struck by lightning." Also the bamboo spikes used for killing pig at the *genna* in honour of Litsapa¹ were stuck into the post after use and remained there, as well as a flat roughly dressed stone said to be of particular hardness and used to hammer in the bamboo spike with which the hole is made in an enemy's head when it is hung and strung. They had one head hanging up from a bamboo, resting against 'madar' tree posts I think, which was recently taken. It was shot with arrows like the head at Thachumi in 1921, though no horns had been attached as in that case.² Probably the scoring of a hit assists the hitting of live enemies in the future. Alongside the head place was a row of gourds probably containing "meat", as at Thachumi, and I noticed that they were all hung on or among 'madar' (*Erythrina*) trees. I noticed that the women, some of them very fair skinned, were tattooed with the familiar mascle pattern, and wore leggings, when elderly, like the Aos, the Khasis, and the Sangtams in the North. The Yazathu



Dressed hearth stones in Yazathu.

¹ Cf. *The Sema Nagas*, pp. 195, 221, 223.

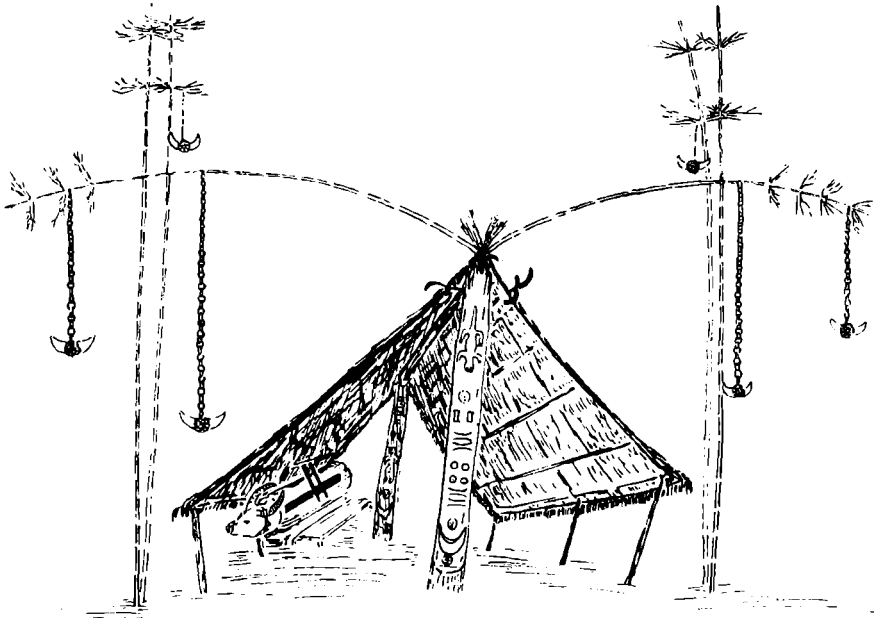
² V, *supra*, page 55.

leggings were white with two narrow black stripes down the centre of each puttee. also saw hearth stones dressed to a round cylindrical shape, though not carved as one in Kuthurr had been. The Y-posts here are carved as in the Sema village, with mithun heads and other devices and the Sema influence is also seen in the use of house-horns¹ which is not a genuine Sangtam fashion.



Carved hearth stone
in Kuthurr.

The village is a mixed one, being about two-thirds Sangtam, with a third Sema, the Semas living in a separate "khel". It was founded by Yazuthu, a Sangtam from Yezashimi, which is now, at any rate, a partly Sema village, though in the latter Sangtam customs and blood are entirely predominant. There are oaks growing freely round Yezashimi. The Sema "khel" was fenced with euphorbia and cactuses (prickly pear). The *morung* in Yezashimi was on the usual Sangtam plan with bamboo horns, from which hung cane globes representing heads, which were adorned like Konyak heads, with horns made roughly of wood and really looking more like



Morung in Yezashiré with log drum slotted in side instead of top.

wings and suggesting perhaps Sir Joshua Reynolds' cherubs. Inside was a drum of a pattern new to me. The head was a buffalo head, carved as usual, but the slit

¹ Apropos of house-horns, it is rather curious to find in a very distant area, but also one in which there are Polynesian or Malay affinities, the use of house-horns, to which, as by Angamis and Semas, imitation birds of wood are attached. This is reported from Madagascar by William Ellis. (*Madagascar Re-visited*, p. 249; *Cf. The Angami Nagas*, p. 5; *The Sema Nagas*, pp. 38, 40, 48.) *Cf.* also P. V., fig. 7.

was along one side. I think also that what there was of a tail was in line with the slit. There was no tail in line with the head. Alongside it was a wooden platform for the drummers. Two of the *morung* posts (there were 3 in all) were carved, and from the gable edge projected the fantastic bamboo roots, so beloved of Yacham, of some Konyak villages and of some Lhotas I think, though the Lhota ones I have seen have been much less fantastic.

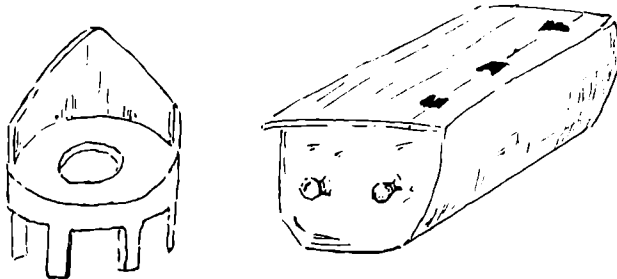
Rengcha told me that Phorre (Photsimi) his southern Sangtam village, also used to make drums once, though not in his lifetime.

Kekhezhe of Tsukohomi came in for a cloth. He represents the companion of Gwovishe in founding the village.—The real chief is Hovoklu, Gwovishe's youngest son, I think, the elder brothers, at any rate having gone out in true Sema fashion to make villages of their own, and leaving the younger to inherit.

25th. The Yezashimi coolies failed to turn out properly, so to cause them to 'eat shame' and to hurry up I picked up a *joppa* that had a headstrap of its own and started up to the village saying that I should claim a mithun as pay if I were not relieved before I reached it. I refused relief till all loads were taken up, and then handed it over to the last coolie just outside the village. It had the effect of hurrying them up all right.

I heard on the way up to the top, of Yimtsung throwing-sticks, attached by a line and so recovered after being thrown, and used in village riots. Also that a Sema's hair turns grey if he enters a porcupine's hole.

We halted at Kosanasami, *alias* Khetoi, *alias* Nikelho, at the top of the ridge and I called in on the chief to drink hot *zu* after my climb. They had some heads, taken from Chimi, in the *atsükoghothobo*, and this village also was fenced like Shothumi (Pl. 15, fig. 6), but more elaborately, with an inner fence of sharpened "ekra" inside the outer one of trees and stakes. I saw no 'panjis'. From Kosanasmi we went down to Kukishe. Nikhui, the old chief, died about a month ago, and his son Nivi, who is no less of a blackguard, reigns in his stead. Went to his house,



Home-made chair and chest, in Nivi's house at Kukishe.

which contains some fine furniture of his own making—a chest to contain ornaments and valuables cut out of one piece of wood about 9 feet long and 3 feet broad and deep, and with handles to pull it by, left projecting from one end in the same piece. He had also a chair with six legs and a back to it, all cut from a single

piece of wood, and he had cut a hole in the seat to make it more comfortable. Outside was a round stone grave built in the Angami fashion (a copy from the Angami according to Nivi) which held the remains of Nihui. In the Angami country these round graves are usually cenotaphs, not tombs, but this Sema copy, as in the case of the one at Vekhomí¹ is an actual tomb.

The other graves in Kukishe were also unlike the usual Sema grave, and were built rectangular, with woven bamboo sides, and a flat top made of unsplit sections of bamboo. In Nivi's house I picked up another form of hand-arrow, used by boys who have not yet learnt to use a spear. It was of bamboo, smoke-hardened, and with a tuft of chicken feathers at the butt. I also noticed a woman wearing a conch shell at the back of the neck in the style followed by the Angami males.

We camped in the Tuzü valley, below Yemeshe and at the point where the path from Kukishe divides to go to Kiyakhu southwards and Yemeshe northwards, a very pleasant spot and a good camping ground.

16th. The night of the 25th was made hideous by hordes of litigants, and by quarrelsome trans-frontier Semas declaring war or wanting to. The villages of Mongre and Yangpire (Yatsumi) have a land dispute and wish to fight, or pretend they do. I said they might fight until it inconvenienced me, and that I should interfere when I pleased, and that meanwhile no other village was to join in. If they have the field to themselves little damage will be done. I applied the same principles to a land dispute between Lhoshypu and Kōsanasāmi, allowing the parent village of Kukishe to join the latter (as I cannot possibly prevent it) and an offshoot of Lhoshypu's to join it to make two a side; I doubt its coming to much, but if it does it will probably have to be stopped pretty soon, as it would be too near to the boundary not to be a nuisance. Meanwhile, however, I do not propose to settle their land disputes for them. The ones inside our present boundary are bad enough as it is.

Mr. Pawsey, with the escort, left me for Sakhālu on his way back to Mōkōk-chung. I went up to Kiyakhu, and dealt with the Kiyakhu-Ghukhwi land case and then over the hill by Zhēkiya down to Satakha, about 10 miles. This case probably settles the matter as far as Kiyakhu and Ghukhwi are concerned, (their dispute dates from at least 1897), but a pretty quarrel is brewing between Zhēkiya and Kiyakhu, which I refused to go into, as one such case is enough for one day and I should have had to go out of my way at least to Shēvėkhe to see all the land concerned. Zhēkiya split off from Kiyakhu some time in the nineties. The Kiyakhu chief gave Zhēkiya all the land on the Zhēkiya side of the Yaputhoyi saddle (there is an erect stone at the spot) the boundary going down the *Kuthu-Agulo* nulla to the Kuthu river on the south, and somewhere along the Chethu stream (which I did not see) to the north to the existing boundary between Zhēkiya on the one hand, and Shėvlekhe and Yemeshe on the other. Probably a future settlement must be more or less on these lines, but as Zhēkiya refused to give the customary leg of a

¹ See the Sema Nagas, p. 246 (illustration).

sambhar he had killed to the Kiyakhu chief, the latter revoked his settlement, and since then the two villages have jhumed theoretically in common, though most of the land now seems to be privately owned. Personally, I see no particular need for a partition, but Zhekiya is loud in its claims, and it must be admitted that if it is not done in this generation, it will become appallingly complicated by the next, when there will be so many more claimants.

27th. To Kilomi.

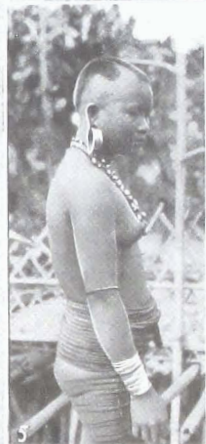
28th. Double marched through Zulhama to Satazūma. Shortly after arriving there Hūnitsō, who should have been nearly at Kohima with my 'dak' but explained his delay as caused by having to chase chickens which escaped from his 'khäng' through many miles of jungle, came up to the bungalow to say that Dēlāhing, who had left Kilomi with my 'dak' early that morning, was lying moribund at the bottom of a very steep slope which runs down from the bridle path below the bungalow towards Zōgazūmi. We got him up and investigated on the spot. He had looked unwell the day before, and told the *dobashis* in the morning that he did not feel quite the thing but expected to make Chazubāmi all right. He had put down his 'dak,' dao and cloth by the road side and had obviously eaten his mid-day meal there, and smoked a cigarette. Then apparently he had had a fit and rolled over the edge and down the slope. Unless he was in convulsions he could not have rolled far in the long grass, but I take it he had a fit as his face was horribly smashed, and the place where it happened was obvious, he had fallen face first on a projecting lump of shale, and shattered both. If he had been pushed he would have either fallen on the back of his head or else put out his hands and saved himself from the full force of the fall at the cost of damaging his hands. He is a man of violent temper and uncontrolled tongue in his cups, but it is unlikely that he had too much to drink, and also unlikely that if the act had been done by someone else the dao, cloth, etc., would not have been thrown over the edge too to delay discovery. Delahing himself was incapable of speech and apparently unconscious, and was continually struggling with violent spasmodic movements of the legs and in a very much less degree, of the arms and hands, reminding me of a tetanus patient. He was frothing at the mouth and breathing with difficulty. We made a litter and sent him off with two *dobashis* to take him to Kohima by relays of coolies from village to village as fast as possible.

29th. Double marched to Sakhabāma, 20 miles, where I learned that Delahing had died the night before shortly after passing Chēswezūmi, without recovering consciousness.

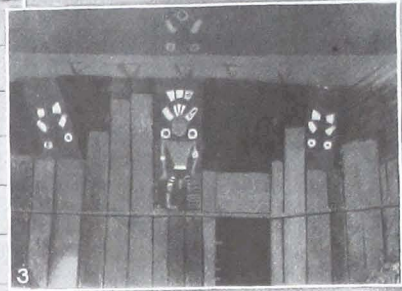
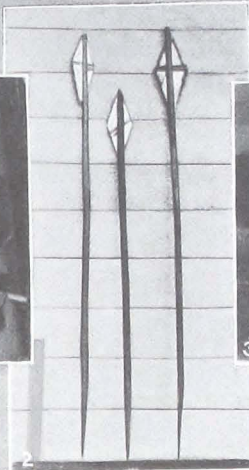
30th. To Kohima. I am told that occurrences similar to the case of Delahing have happened at that spot before. They are ascribed to a *deota* (godling) which appears to be in the nature of a *polltergeist* of some particularly potent description. One of the Zogazuma *gaonburas* was killed by it. It threw him about and wrestled with him, and he was unable to see it. He died the day after, I think.

ERRATA.

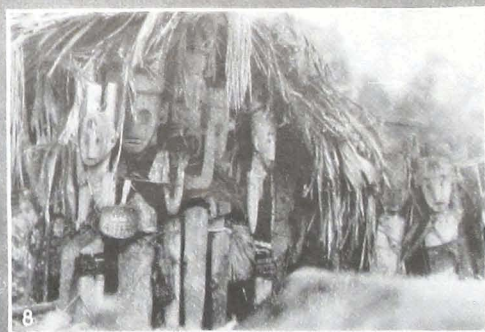
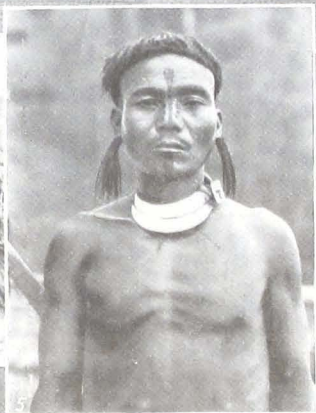
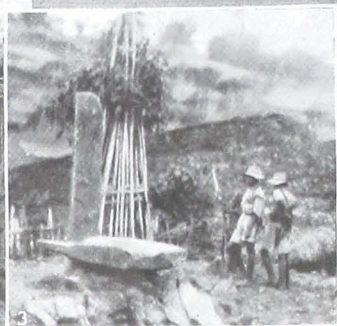
- Page 1, line 2. After "Mr. J. P. Mills," for "I.P." read "I.C.S."
- Page 16, Note 2, line 4. For "spirits, bridge" read "spirits' bridge".
- Page 25, line 11. Delete the colon after "Konyaks".
- Page 30, line 6. "Palaung" should not be italicised and "(Burmese)" should read "(Burma)".
- Page 42, line 13. After "added for each" insert "head" (at end of line).
- Page 50, title under cut—Delete the hyphen between "skull" and "hanging".
- Page 52, line 25. For "notice" read "noticed".
- Page 63, last line. For the hyphen between "kit" and "shields" substitute a dash.
- Page 68, line 1. After "puttee." insert "I".
- Page 69, line 7. For "southern Sangtam" read "Southern Sangtam".
- „ „ line 19—"throwing-sticks". Add a footnote:—
- “It is, as a matter of fact, the line that is thrown, not the stick, which acts as a sort of rod with which to cast a weighted line to operate as a bolas, and then as a bludgeon to batter the lassoed antagonist.”



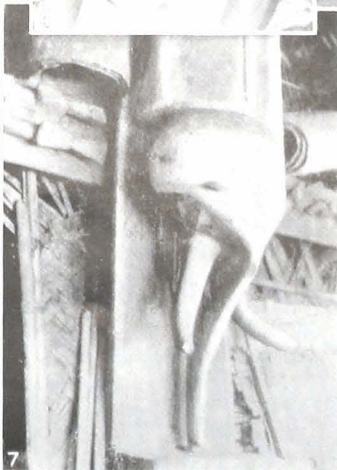
1. Morung at Ükha.
2. Effigies of the dead at Ükha.
3. A genna erection in Yaktu or Yonghong with darts sticking into it, *c.f.* Mills' *The Lhota Nagas, s.v., Opya*.
4. Women of Mongnyu.
5. A Girl of Yungphong.
6. Konyak Naga (Namsang) with skull to which grass tassels have been attached for dancing.
7. Yungya head trophies—
 - (1) Monkey skull; wooden jaw; humane cranium; fragment of jaw wedged in between skull and jaw; wooden horns; grass tassels.
 - (2) Two fragments of crania.
 - (3) Several fragments of crania over top of a monkey skull with fragment of human jaw.
 - (4) Cane basket ball, human jaw with fragment of bone attached.
 - (5) Cane basket ball; fragment of human cranium; serow horns.
 - (6) Monkey's skull with jaw of bear (?) and wooden horns.
 - (7) Human skull without face; iron spearhead attached; buffalo horns with beans and tassels of grass.
 - (8) Human skull; (?) bear jaw; buffalo horns.
8. Cloths of the dead put up by the Angamis of Viswema.



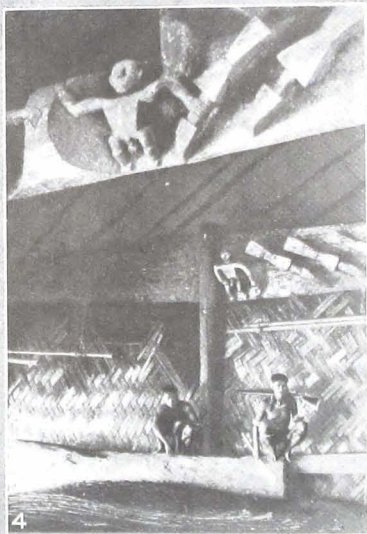
1. Carvings in Yonghong.
2. Darts used by Ükha, Yaktu and Yonghong, feathered with pandanus leaf.
3. Narrow waisted men in Pulomi (Kenoma), the lines around the waist here have clearly been interpreted as the lines of cowries on an Angami kilt; yet the nakedness is also retained and tufts of real hair are pegged at the ears and fork.
4. A girl of Yungphong.
5. Morung at Yaktu.
6. Chief of Yonghong, wearing brass buffalo-horn symbol on head.
7. Menhirs at Yonghong.
8. Carvings on a house in Yonghong.
9. Narrow waisted men on the priest's house in Chekwema (Yangkhulen). The black and white bands round the waist are of equal width except on the middle figure, and do not appear to have been assimilated to the Angami kilt yet except in the middle figure. Tufts of hair are pegged in at the ears, fork and sometimes the chin.



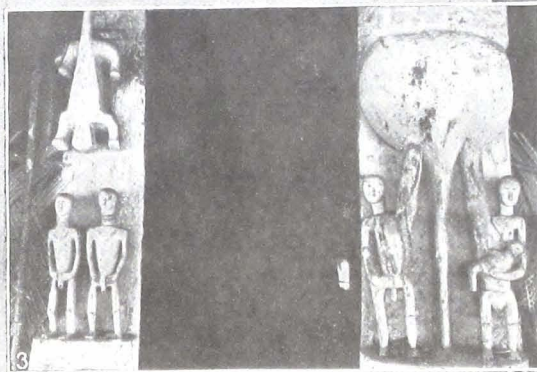
1. Figures of dead warriors (decapitated by the enemy) in Angfang.
2. Sitting stones and small erect stones at Yonghong.
3. Erect and flat stones in Angfang.
4. Konyaks of Longmien.
5. Konyak (Chägyik) tattoo on a man from (?) Tobu.
6. Soul effigies from (1) Yonghong, (2) and (3) Angfang.
7. Effigy of the dead in Chaoha.
8. Soul effigies at Angfang.



1. Dolmens and a menhir in Longmien.
2. Wooden figures put up by the Ang in Longmien.
3. Carving in a Chinglong morung.
4. Shopen of Tangsa showing tattoo.
5. Tattoo-masculy—on a Sängtam woman.
6. Stone path in Longmien.
7. Carving of an Elephant in a Chingtang Morung.
8. Stone path in Longmien.



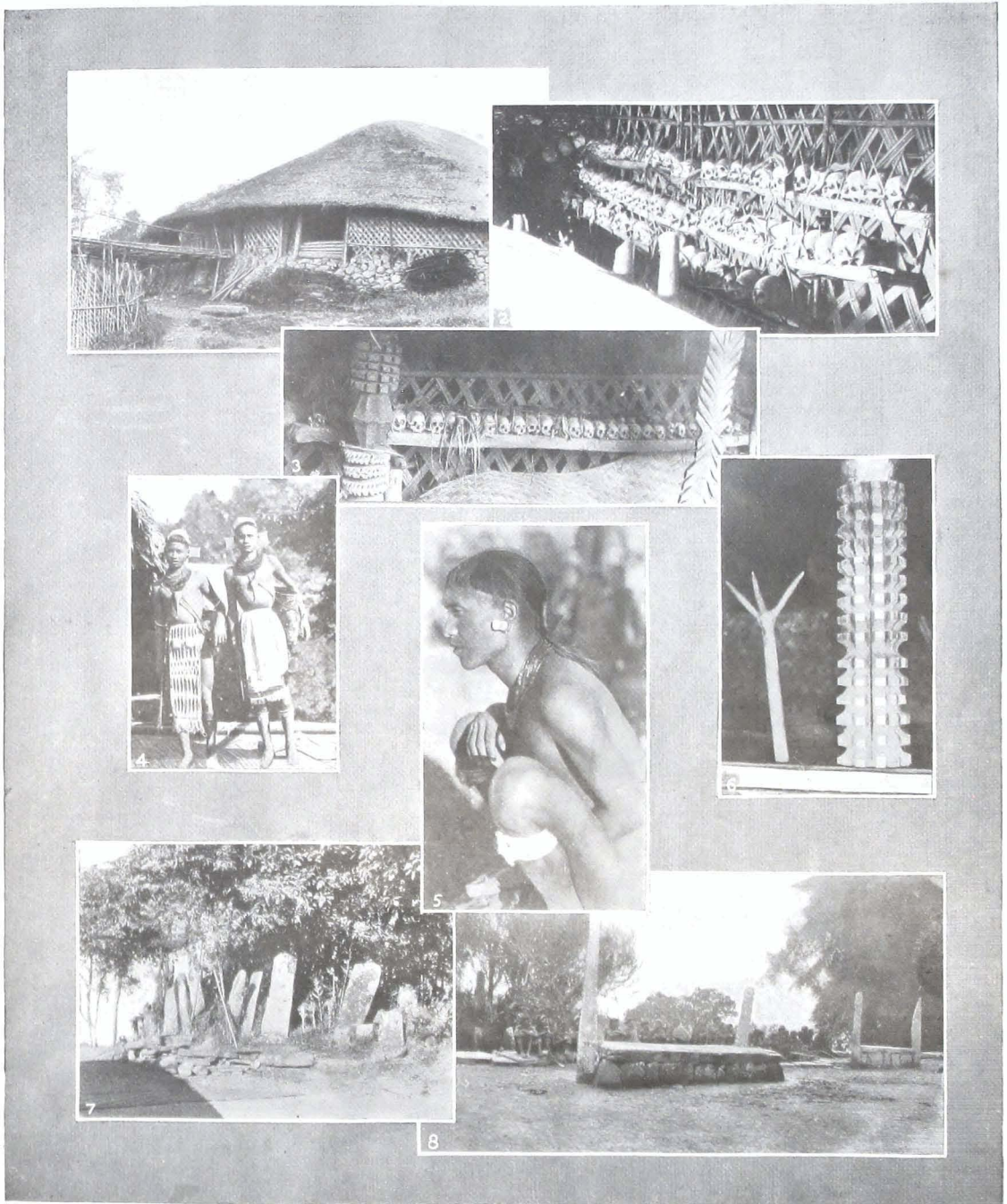
1. Hamshen of Tangsa showing tattoo.
2. Skulls at Yanha (photograph by Mr. H. C. Barnes).
3. Hamshen of Tangsa showing tattoo. The ring round his neck is not a Konyak ornament but one provided by the Inspector General of Prisons.
4. Interior of a morung in Wakching.
5. A man of Kongan showing tail of the bark of *Aquilaria agallocha* Rox. and method of carrying dao by tucking the handle under the belt, an apparently inconvenient method also used by the Maori (Old New Zealand, by a Pakeha Maori, Ch. III).
6. Young girls of Kongan.
7. Morung in Kongan showing carved hornbills on roof.



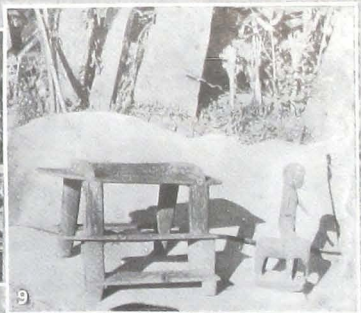
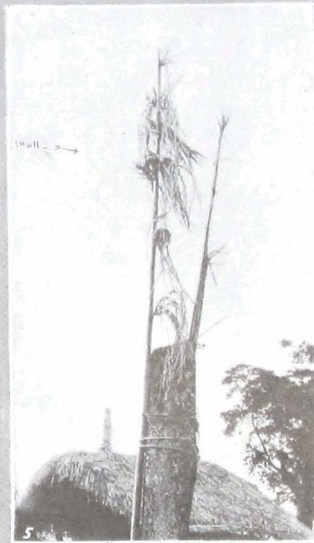
1. Derelict skull-boxes in Kongan.
2. The skull box, and contents, with the lid removed.
3. Carvings in front of Kongan Morung.
4. The decorated skull on the lid (beside the thatched skull cover with the box in the background).
5. Skull-box containing the skull and covered with a flat stone as lid; alongside is a conical thatched skull cover.
6. 151 Enemy skulls at Yanha.



1. The Merhema *dahu*.
2. Building the Semoma *dahu*.
3. Woman of the "slave" clan in Longlam (*vide* entry of April 20th). [For the use of this and six of the photographs which follow it, I am indebted to Mr. J. P. Mills.]
4. Soul figure at Zakkho.
5. Chief of Auching and his family.
6. The Thevoma *dahu*.
7. The Semoma *dahu*.



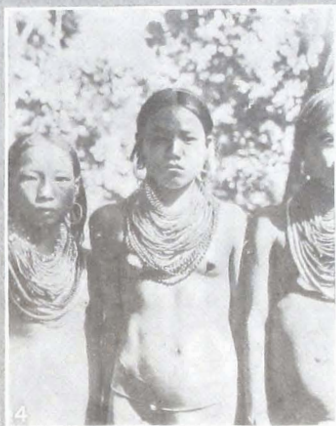
1. The house of the Ang of Môn (back).
2. The skulls in the Ang's morung at Chī.
3. The skulls in the verandah of the Ang of Chī's house.
4. Thevang, son of the Ang of Wangla and his brother.
5. A man of Chī.
6. Carved wooden pillar in the Ang's house at Sangnyu.
7. Erect and other stones outside the Ang's house at Sangnyu.
8. Stone seats of the Ang of Chī and of his brother.



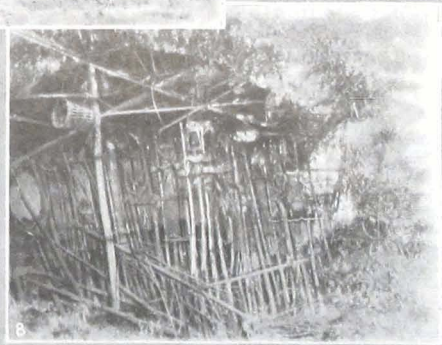
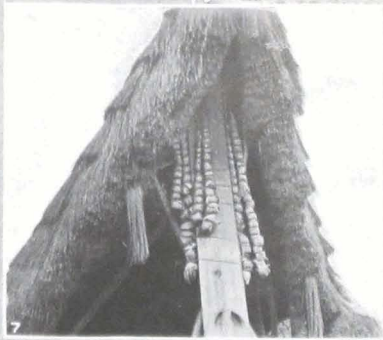
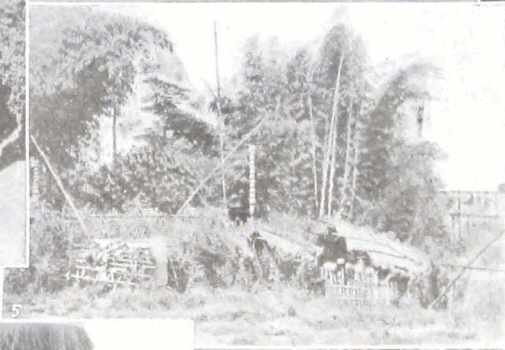
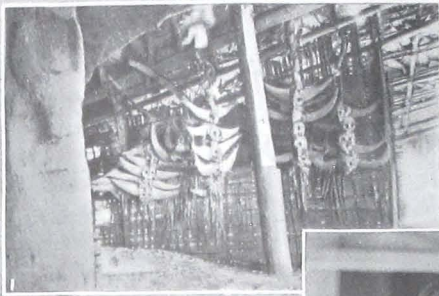
1. Soul figures at Môn.
2. Monkeys (or humans) searching one another for vermin. Carving in a Chi morung.
3. Burial place in Môn, with a wooden seat and silk cloth placed for the soul to use. The pots contain the bones of the dead and also offerings.
4. A fresh tattoo showing in weals on a son of the Ang of Chi.
5. Skull hoisted on bamboo tied to menhir to await the *alcapu* ceremony.
6. Face and chest tattoo—the son of the Ang of Chi.
7. The back of a Konyak head-dress.
8. Outside the home of the Ang of Môn.
9. Smaller throne of the Ang of Sangnyu.



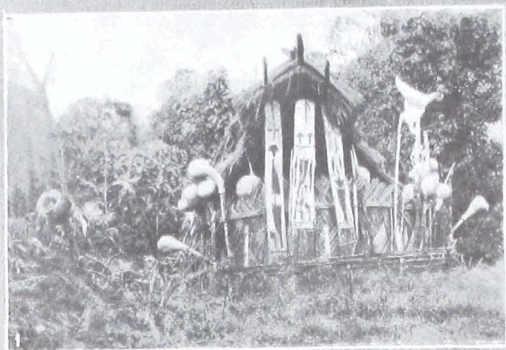
1. A son of the Ang of Chi.
2. The house of the Ang of Chi (front).
3. Girls of Chi.
4. Carvings of dogs in a morning of Chi. A similar motif seems to exist in ancient Etruscan art, *vide* the carving on an ivory pommel in the Museum of Florence, depicted in the *Illustrated London News* of January 9th, 1924.
5. Women of Chi. It is considered "good form" when there are strangers about to put on clothing. Otherwise it is not necessarily worn by the unmarried women and by young married women, though matrons always wear a narrow petticoat.
6. A fresh throat tattoo seen in Chi.
7. Two young men of Chi.
8. Lungtrok.
9. The same two young men of Chi (from behind).



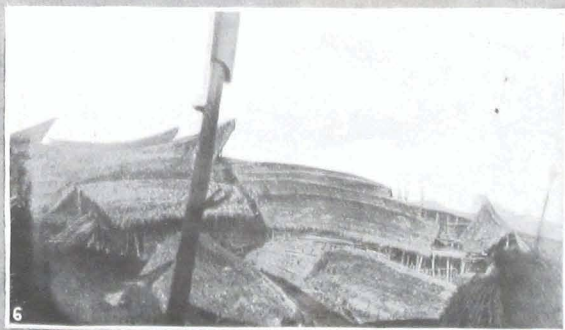
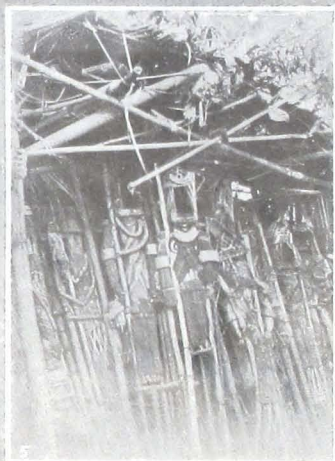
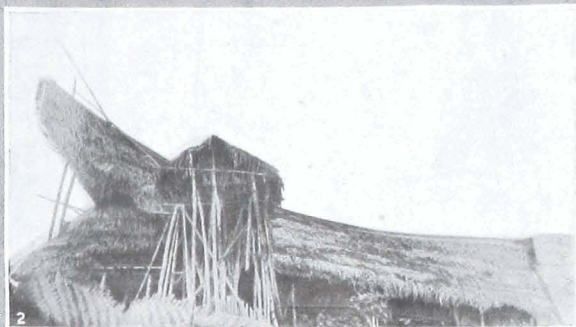
1. Lungtrok—the Female stone.
2. Lungtrok—the Male stones.
3. The Ang of Môn.
4. Women of Chī (photograph by Mr. J. P. Mills).
5. The Ang of Tang.
6. Stone table for heads and pile of erect stones round the house of the Ang of Môn.
7. Woman at Môn of the "slave" clan whose heads were shaved to keep their hairs from their chief's food.



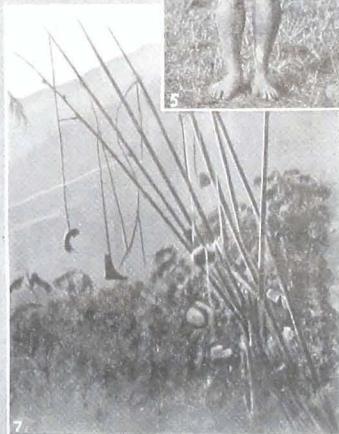
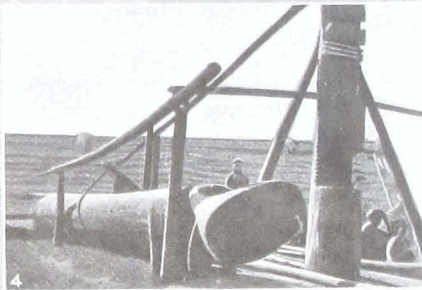
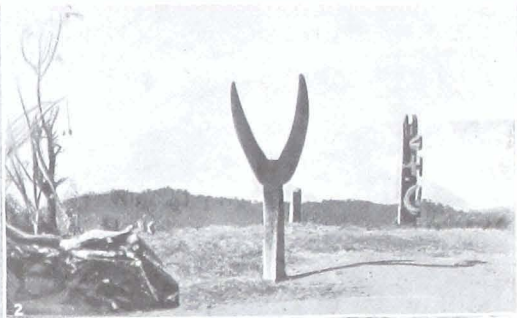
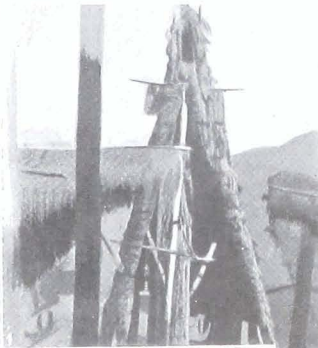
1. Töbū heads in a Häkchäng morung.
2. Chang woman showing tattoo.
3. Chang women (photographed by Mr. Mills).
4. Two girls of Chingfoi (photographed at Wakching by Mr. Mills).
5. Graves and a Memorial at Chimongre.
6. Mongko's wife (photographed by Mr. Mills).
7. Drum house in Chongtore.
8. Tobu soul house.



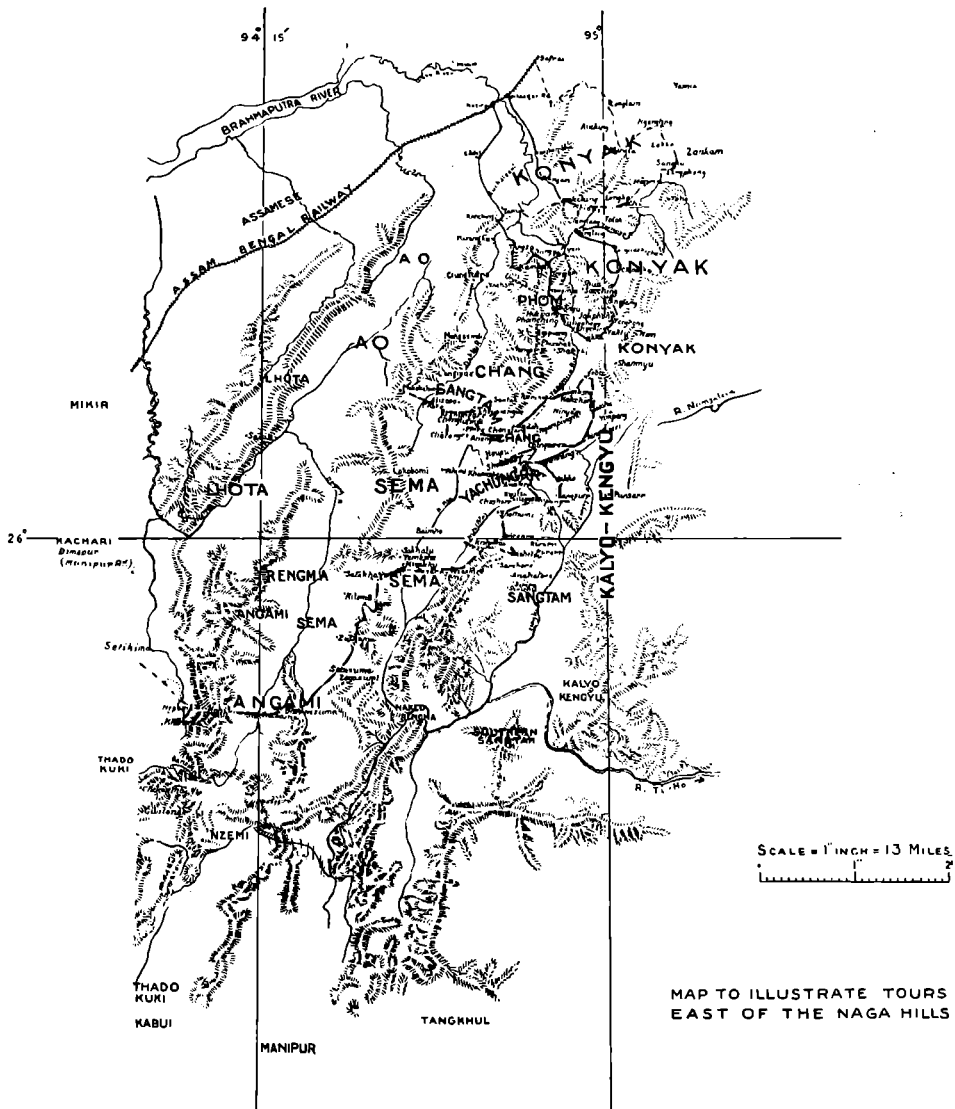
1. A grave at Chimongre with representations of daos and hoes painted on the wood posts.
2. The Bilaeshi Khal, still dancing at 8-15 A.M.
3. Skulls, and cane substitutes for skulls, in drum-house at Chongtore.
4. Chang woman showing tattoo.
5. Drum-house in Chongtore.
6. Tuensang—the Bilaeshi Khal still dancing after just 12 hours of it and well after sunrise.
7. Chimongre—a drum-house and skulls.



1. Häkchäng village.
2. Morung in Tobu.
3. Head and limbs hung up in Chentang.
4. A Sangtam girl (photographed by Mr. Mills).
5. Soul figures at Tobu.
6. Chingmei village.
7. Chingmäk of Chingmei (photographed by Mr. Mills).



1. Morung in Tuensang.
2. Y-post in Kishethu and posts of derelict morung in background; on left, *erythrina* tree where heads are hung.
3. Öngli-Ngäku—A Chang of the Chongpho clan. Head Interpreter at Mokokchung.
4. Log-drum and carved post at Yazathu.
5. A Chang buck (Minkei of Yongemdi).
6. Shothumi village showing palisade.
7. Head and limbs hung up in Chentang.



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THE LANGUAGE OF THE MAHĀ-NAYA-PRAKĀṢĀ.
AN EXAMINATION OF KĀSHMIRI AS WRITTEN
IN THE FIFTEENTH CENTURY.

BY

SIR GEORGE A. GRIERSON, O.M., K.C.I.E., PH.D., D.LITT., LL.D. *Vāgīśa.*
Honorary Fellow of the Asiatic Society of Bengal.



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CENTURY.

By Sir GEORGE A. GRIERSON, O.M., K.C.I.E., Ph.D., D.Litt., LL.D., Vāgīśa.
Honorary Fellow of the Asiatic Society of Bengal.

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THE LANGUAGE OF THE MAHĀ-NAYA-PRAKĀŚA.
AN EXAMINATION OF KĀSHMĪRĪ AS WRITTEN IN THE
15TH CENTURY.

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INTRODUCTION.

The *Mahā-naya-prakāśa*¹ was the work of a Kāshmirī Paṇḍit named Śitikaṅṭhā-cārya. It is an esoteric treatise belonging to the Trika school of Śaiva philosophy, and, as stated by Paṇḍit Madhusūdana Kaula in the "Short Review" referred to below, its theme is "the *Mahārthaparakāśa*, or the Illumination of the Highest Object in Life," in discussing which the author devotes the greater part of his exposition to a consideration of the mystic properties of the various letters of the Śāradā alphabet. It is a very rare work,—only two manuscripts, so far as I am aware, being known to exist. These were utilized for the edition prepared for the Kashmir Series of Texts and Studies by Mahāmahōpādhyāya Paṇḍit Mukunda-rāma Śāstri.² Neither MS. was quite complete, and, unfortunately, one does not always supply material for the lacunæ in the other, but it has been found possible to prepare a very fair text of nearly the whole of the work.

The author's preface concludes with the following words:

अथोचितवृत्तानां बुद्धिं सर्वगोचरया देशभाषया विरचयितुमाह,

that is to say that he begins his book with a dainty laudation (of Kṛṣṇā Dēvī) couched in the local dialect as generally current. Thereafter, the work consists of about 94 verses in Old Kāshmirī, each with a lengthy commentary in Sanskrit. The verses themselves are not easy to understand. The language is old, belonging to the period when Prakrit, in the Apabhraṃśa stage, had just merged into the language that finally became the Kāshmirī of the present day.³ It is a matter of regret that the Sanskrit commentary does not give much help. It nowhere pretends to explain the verses,—rather, it takes each verse as a sort of text, from which the commentary starts on a Sanskrit exposition of some esoteric doctrine. My experience is that the Kāshmirī Paṇḍits whom I have consulted, even though they are deeply versed in Trika philosophy, and though they, with the hints provided by the

¹ Cited in the following pages as MNP.

² I have myself a careful copy of the better of these two MSS. I have found it useful for checking the printed edition, which is not free from misprints. I cite this printed edition as P.

³ In the following pages, I refer to the Kāshmirī of the present day as "Mod. Ksh."

commentary, are able to give the general sense of a verse, are not always able to give its literal translation, and, in an enquiry into the old form of Kāshmiri used, such a literal translation is absolutely necessary. As I cannot myself pretend to be familiar with the mystic details of the Trika system, I do not venture to assert that I have been uniformly successful in elucidating the exact meaning of every old Kāshmiri word, but I have done my best, and have been greatly helped by a Sanskrit translation kindly prepared for me by Paṇḍit Nityānanda Śāstri, the Head of the S. P. College in Śrinagar.

On page 34 of Paṇḍit Madhusūdana Kaula Śāstri's "Short Review of the Research Publications of the Kashmir State,"¹ there is given a brief account of the contents of the *Mahā-naya-prakāśa*, but the writer was unable to say anything regarding its author, except that his name was Śitikaṅṭha. On enquiry, I have obtained the following additional information from Paṇḍit Nityānanda Śāstri: Śitikaṅṭha was also author of the *Bāla-bōdhini-nyāsa*, a *vyākhyā* on the *Bāla-bōdhini* of his ancestor Kavindra Jagaddhara. In the Introduction to this *Vyākhyā*, Śitikaṅṭha states that he wrote it during the reign of (Husain Shāh), the son of Haidar Shāh. The relevant verses run :—

श्रीबालबोधिन्यभिधां कवीन्द्रो
जगद्भरोऽयां विततान वृत्तिम् ।
तद्गणकन्यातनयातनूजो
व्याख्यान्यहं तां श्रितिकण्ठकोऽल्पम् ॥
* * * * *
सर्वक्यापतिमौलिहारितनवप्राज्यस्वराज्यः परं
तत्त्वातत्त्वविचारकारिभिषगो गाम्भीर्यशौर्यान्वितः ।
कश्मीराधिपतिः कृपाजलनिधिर्विख्यातकौर्विस्मिरं
जौश्याद्भैरवाहस्तनुरनघः कन्दर्पदर्पापहः ॥

According to Hariścandra's *Kasmīra-kusuma*, Husain Shāh came to the throne in 4583 K.Y., equivalent to 1482 A.D., and we may therefore safely say that Śitikaṅṭha flourished in the latter half of the 15th century A.D.

So far as I am aware, the only other work in old Kāshmiri that has come down to us is the *Lallā-vākyāni*² of Lallā or Lal Dēd. Lallā flourished in the latter half of the 14th century, or about a century before Śitikaṅṭha. It is therefore to be expected that her songs would be in a language still more archaic than that employed by him. As a matter of fact, as we have Lallā's work at the present day, nothing could be further from the fact. Save for a few forms that have remained unchanged owing to religious associations, to unintelligibility, or to marked strangeness, as we have them now, her verses are in what is practically modern Kāshmiri. The reason is interesting, and is of some importance for the history of Indian language

¹ Published by The Superintendent, Research Department, Śrinagar.

² Edited with a translation by G. A. Grierson and L. D. Barnett, in Vol. XIII of the Royal Asiatic Society's Monographs (1920).

ages in general. During the five hundred years that have elapsed since she composed her hymns, they have never been written down as a *corpus*. It is true that now and then some interested scholar may have made his own collection of a few of them, or may have translated a dozen or so into Sanskrit, but such people were not the custodians of her teaching. In Kashmir there have been for centuries, and still are, schools of professional reciters, in which each individual has received by tradition the words of folk-tales, folk-songs, or the like, and recites them when called upon to do so. Some of these men make it their business to recite Lallā's hymns for the benefit of those piously disposed. Each reciter has his own text recorded in his memory exactly as he received it from his teacher-predecessor, and never dreams of altering it, even when he does not understand it. If he is asked the meaning of some hard saying, he will frankly say that he does not know,—“It is an old word. That is what I have received from my teacher,” and there the matter ends. The audience, if it is not composed of European philologists, is quite satisfied. I have described this system of memorial tradition at length in the Introduction to the *Lallā-vākyañi*, and need not repeat the explanation here. Suffice it to say that we have here reproduced, in modern days, the method according to which, in ancient times, the Vedic hymns were preserved before they were reduced to writing. Each hymn was handed down from teacher to pupil through five centuries, care being taken to preserve the text unchanged.¹ But during all this time the language was insensibly changing, and, as there was no written record of the originals in the form in which they were first uttered, the language of the hymns insensibly changed at the same time. The reciters, it is hardly necessary to point out, were unaware of the change of language that was going on. In each generation that was very slight, and was not noticeable, but the total of the changes at the end of five centuries was very great indeed, and, as stated above, the hymns are now recited in modern Kāshmirī, although it is impossible to show any moment of time at which any, even the smallest, change of language took place. It was so gradual that no one was ever aware that any change was taking place at all.

It is very different in regard to the *Mahā-naya-prakāśa*. Here we have the verses written down at the time that they were composed, and we can gauge the change that has taken place in these four centuries. To take examples :—

Kalhana, writing in the twelfth century, two hundred years before Lallā, quotes (*Rāja-taraṅgiṇī*, V, 398) a sentence in the Kāshmirī of his own time. The words are *raṅassa hēlu diṅṅa*, (the village of) Hēla (is) given to Raṅga. In modern Kāshmirī, this would be *raṅas hyūl*" (or *hēl dyut*", so that each word has materially changed. The next written document is the MNP., written three centuries later. Let us now take the verse (XII, 6) quoted and translated by Paṇḍit Madhusūdana Kaula in his "Short Review," referred to above :—

¹ The verbal memory of these Kāshmirī reciters is something extraordinary. I have the text of some prose stories told by one of them, as he recited them in the year 1896. Fifteen years afterwards the same man repeated the same stories to Sir Aurel Stein, and the new text was not only verbatim the same as the old, but contained the same grammatical slips, and the same "old words," the meaning of which was unknown to him.

*nitya samādhānē ḍalavānē
caryācarya-kamē ukkiṣṭa
lauki lōkōttara vasavānē
ēhu kamathu bhajīva nayaniṣṭha,*

equivalent to the Sanskrit :—

*nitya-samādhānēna adōlāyamānāḥ
caryācarya-kramēna ukṣṭāḥ
lōkē lōkōttarē vasantāḥ
imam eva kramārtham bhajata (yūyam hē) nayaniṣṭhāḥ.*

Paṇḍit Madhusūdana Kaula's translation (with a few verbal alterations) is as follows :—

“ Ye who are stable by constant meditation, ye who are elevated by (following) the order of due observance, ye who dwell in this world and the next, following the right path, serve ye this, the only object of pursuit.” In Modern Kāshmiri, this would be :—

*nēth samādōn' aḍalawān'
ṭsaryāṭsarēkam' wukkiṣṭ
lūk' lūkuttār' wasawān'
yihuy kamoth" baziv nayēniṣṭh.¹*

It will be seen that, in the four centuries that have elapsed since Śitikanṭha's time, the changes have been very considerable.

If I may venture to call Dr. Barnett and myself the *Vyāsas* of the Lallā-vākyāni, it appears that in the case of literary works preserved only by memorial tradition, and then, after centuries, for the first time collected and fixed as to text, the text so edited must be in the language of the time of the *Vyāsa*, and not in the language in which they were originally composed. This must be true of all languages and of all literary works, sacred or profane, and it follows that, in regard to the oldest Vedic hymns, as we have them now, they are not in the language in which they were originally composed, but in the language current at the time that the *Vyāsa*, or *Vyāsas*, lived and edited them. The only exceptions to this general statement would be, as in the case of the *Lallā-vākyāni*, certain words preserved unchanged and fossilized for special reasons, such as peculiar sacredness, unintelligibility, or strangeness. It is the existence of such words that guarantees the conscientiousness of the bearers of the tradition ; for one who was not conscientious would show no hesitation in making that which was unintelligible intelligible, or that which was difficult easy. In the case of such professional reciters, who would have every inducement to make the traditional verses intelligible, any conjectural emendation would at once have been accepted on their authority ; but, following the tradition of their calling, they preserved the obscure passages unchanged.

Unfortunately, for the *Vēda*, we have nothing corresponding to the *Mahā-naya-*

¹ I have followed Paṇḍit Madhusūdana's translation, but have altered the spelling to agree with that of my Kāshmiri Dictionary. I doubt if the word *kamoth*" really exists in the modern language.

prakāsa, i.e. nothing written, and fixed in writing, at about the time that the oldest Vedic hymns were composed, so that we are unable to gauge the difference between the original form of the hymns and the form given to us by the Vyāsa; but the parallel case of the *Mahā-naya-prakāsa*, is instructive, and shows us that the difference must have been great. In other words, the Ṛg-vēda, as we have it now, is couched in a modernized form of the language in which the oldest hymns were originally composed.

As regards the language employed by Śitikanṭha, it was, as I have said, in that stage of development in which Apabhraṃśa has just emerged into a modern vernacular. Many of the words used were, indeed, as we shall see, still in the Apabhraṃśa stage itself. We must, however, remember that the author was a Paṇḍit, steeped in Śaiva philosophy, making free use of Śaiva technical terms, and, like others of his kind, thinking in Sanskrit, and not in the local dialect. Hence, the verses are full of *tatsamas*,—Sanskrit words borrowed unchanged, or else slightly altered to suit the pronunciation of his time, or to meet the exigencies of metre. Often we find a word used in both stages of its existence. Thus, we have Apabhraṃśa *gau*, gone, in VI, 1, but the Sanskrit *tatsama gata* (for *galā*) in I, 4. The latter word is an example of the fact that, when such a *tatsama* word was borrowed, the author put it on the same level as that of a *tadbhava*, and declined it, or conjugated it, as if it were a Kāshmirī, and not a borrowed word. As another example, take the word *upayōga*. This is borrowed in XIII, 4, and is then declined like a Kāshmirī word, being given an instrumental singular, *upayōgē*, representing the Sanskrit *upayōgēna*. This is different from the custom of such languages as Pañjābī or Hindī, in which borrowed *tatsamas* are immutable. For instance, the Hindī *tadbhava ghōrā*, a horse, has *ghōrē* for its oblique case singular, but the oblique singular of the *tatsama rājā*, a king, is *rājā*, not *rājē*. In Hindī this causes no unintelligibility, for the relations of case are indicated, when necessary, by the addition of defining words, or postpositions, “of a horse” is *ghōrē-kā*, and “of a king” is *rājā* (not *rājē*)-*kā*. In the MNP., such defining words are hardly at all employed, and case-relations must therefore necessarily be indicated by a change in the form of the main vocable, as in Sanskrit or Prakrit, and this accounts for the use of Kāshmirī terminations tacked on to Sanskrit words. It is as if, in English, we borrowed the Latin word *bacillus*, and then, to make a plural, used the English form “*bacilluses*,” instead of the Latin *bacilli*.

Another point must be noted. Except for two or three doubtful expressions, Śitikanṭha's vocabulary is entirely Indo-Aryan. Nearly every word that I have succeeded in analysing can be shown to be derived from a Sanskrit original. This is very different from what we find in Modern Kāshmirī and in other Dardic languages, in which, as I have often maintained, much of the vocabulary is not purely Indo-Aryan, but must be referred to an Aryan dialect which, while closely related to Indo-Aryan, has at the same time Eranian affinities. The Indo-Aryan character of Śitikanṭha's language is accounted for by the nature of the subject with which he dealt, and by the fact that he was a Sanskrit scholar. Like others of his kind, he

thought in Sanskrit, and then translated the Sanskrit words conveying what he thought into the Kāshmiri of his time. In such circumstances his vocabulary would necessarily be Sanskritic in character, and so far, while being perfectly intelligible to his educated fellow-countrymen, would differ from the ordinary language spoken by those Kāshmiris of his time who were not Paṇḍits. I have myself seen very much the same process going on at the present day in India Proper. In Mithilā, it was in my time (say, the seventies of the last century) the custom for Paṇḍits to compose short little dramatic works in Sanskrit for performance at this or that festival. These were modelled on the plays of classical Sanskrit and therefore contained Prakrit passages. But, in my day, no Paṇḍit that I knew wrote these down directly in Prakrit. The author wrote the passages in Sanskrit, and then translated them into Prakrit for the fair copy. I know this, for I have myself seen the process, and have even assisted by lending my copy of the *Prākṛta-prakāśa* to an aspiring dramatist.

A few words may be devoted to the metre of the Kāshmiri verses contained in this work. In the edition of the *Lallā-vākyāni* I have explained how the hymns appear to have been originally based on metres the essential element of which was quantity, such as the familiar *dōhā*. But, throughout, stress-accent has since taken the place of quantity, and the metre, as we have it now, is essentially accentual, quantity being entirely disregarded.

The same peculiarity is occasionally observable in the verses of the MNP., but the original *mātrā*-system is more evident, and in some instances is entirely preserved to the eye. The metre everywhere is the same as the *Sawāyā* of India Proper. Each verse consists of four lines, the first and third containing 16, and the second and fourth 15 *mātrās*. In the MNP. these *mātrās* are divided as follows:—

First and third lines : 6+4+4+2=16.

Second and fourth lines : 6+4+4+1=15.

A good example is III, 2, which runs as follows:—

yasu⁶ yasū ja | ntusa⁴ sam | vida⁴ yasa | yasa²
 nīla⁶ pīta | sukha⁴ duḥ | kha⁴ sarū | pa¹
 udayasa⁶ da | tta⁴ samā nī⁴ sama | rasa²
 kama⁶ kāmpana | tasa⁴ tasa | anurū⁴ pa¹

Very few verses, however, agree so well as this with the normal scheme. Quantity is often disregarded. Thus, in the second line of I, 3, we find *jaga-ghāsmaru* | *bhairu* | *bhākṣē* | *ta*, in which the word *bhairu* must be read as *bhairū* or *bhairō* in order to make it scan. Again, in II, 4, in *icchāna* | *ntarū* | *nā* | *nu-cē* | *ni* | *ṣkalu*, the word *cē* must be read as a short syllable for the sake of the metre. Such irregularities are very common. Besides these licences, the author over and over

¹ *Udayisa* of the printed text is a misprint.

again puts, by anacrusis, one or more syllables at the beginning of a line, before the point at which the reckoning of the normal feet begins.¹ These syllables are necessary for the sense, but, if reckoned for scansion, break the metre. Thus, in the fourth line of I, 4 :—

sā | *nēka-rūpa* | *akkai* | *viṣayū* | *na*,

the word *sā* is additional, and breaks the metre. The same occurs in many other verses, and an extreme instance is II, 4, in which *sō*, *yasa*, and *yavyu* are prefixed, each to a different line of the same verse.

On the whole, however, the verses of the MNP. approach the normal scheme of the metre chosen more nearly than does the present day form of the verses of Lallā.

In the following pages, I have done my best to analyse the phonetics of the language used by Śitikaṇṭha, and to find the principles of its accidence. The subject will be of interest to philologists, because, so far as I am aware, it is the only existing record of the state of the Kāshmiri language in the 15th century, when it had not far emerged from the stage of Apabhramśa. The results possess value from two points of view. In the first place, they show clearly the lines of connexion between the Indo-Aryan side of Kāshmiri and Sanskrit, and, in the second place, they throw light on various forms in Modern Kāshmiri that, but for the MNP. would be inexplicable.²

I have, I fear, somewhat overloaded my discussions with examples, but I have done so deliberately. It is quite possible that some of my readers may feel hesitation in accepting explanations of particular words, and for this reason I have multiplied my examples as much as possible. Indeed, I believe that,—excepting manifest tatsamas,—I have quoted every form occurring in the text, and in each case have given a reference to the verse or verses from which it has been taken. Nor have I confined myself to forms that support what I may chance to say. I have tried to give every form that requires explanation, and when I am unable to explain it, I do not hesitate to say so. In this way, my statements can always be checked, and if, in any matter, I happen to be wrong, I shall be the first to welcome the correction.

¹ I have followed Mr. H. W. Fowler's definition of anacrusis, as given in his "Dictionary of Modern English Usage."

² A good example of this is the modern Kāshmiri word *brōṭh*, before. But for the form *bārōṭhē* occurring in the MNP. (VI, 3), we should be unable to trace its derivation. *Bārōṭhē* itself is a Prakrit form of the Sanskrit *dvāra*-(*pra*)*hōṣṭhēna*.

PHONETICS.

APHESIS AND APHAERESIS.

1. **Aphesis** of *a* is common, as in *kṣāṅga-* (*akṣāṅga-*), VI 1; *ghōṣa* (*aghōṣaḥ*), VIII, 1; *ḍalavānē* (*adōlāyamānāḥ*), XII, 6; *nanīta-* (*ananta-*), I, 3; *nākhya* (*anākhyā*), XI, 1; *nākhya* (*anākhyēyā*, *-ya-*), III, 6; XIII, 2; *nāhata-* (*anāhata-*), IV, 4; *nēka-* (*anēka-*), I, 4; *māvāsī* (*amāvāsyaḥ*), VIII, 3; *rtha* (*artham*), III, 6; *lan̄karanō* (*alam̄kuranam*), IV, 2; *vātō* (XIII, 1) and (*vōtu*) (X, 1) (*avāptam*); *ham̄kārē* (*aham̄kārēna*), VI, 5; *hanti* (*ahantayā*), I, 5.

2. Aphesis of *u* occurs in *phāya-* (*uphāya-*), IX, 7; X, 1. The Mod. Ksh. word is *phāy*.

3. Aphesis of *ē* occurs in *ka* (*ēkam*), III, 3; but this may really be aphesis of *a*, as *aku* is one of the forms taken by *ēkaḥ*. See §208.

4. **Aphæresis** of *h* occurs in various forms of one word, viz.: *ṛda-* (*hṛt-*), XII, 3; *ṛppada-* (*hṛd-pada-*),¹ VIII, 2a; *ṛdayā* (*hṛdayāt*), XII, 2; *ṛdayi* (*hṛdayē*), XII, 5. Possibly there is also aphæresis of *h* in *masāna-* (*smasāna-*), IV, 1, for which see §123.

VOWELS.

5. *a > ā* in *ād̄hina* (sTs.) (*adhīnāḥ*), VII, 7; *sāpajji* (*sampadyatē*), XII, 2. In Mod. Ksh. the $\sqrt{\text{sampad-}}$ (p.p. *sampanna-*) takes several forms, such as *sapan-*, *sāpau-*, *sapaz-*, *sapad-*, and others.

6. *-a > -i-* in *antaradiśa* (*antardaśā*), X, 2.

7. *-aḥ > -u* or *-a*, as in Apabhraṁśa. For many examples, see the nominative singular in the declension of nouns (§§155, 160). Other examples are *piśandu* (*spṛśantaḥ*, nom. pl. masc.), IV, 3; *adha-* (sTs.) (*adhah-*) VIII, 2a; *mana* (*manah*), IV, 6. The Skt. *antaḥ* is represented by *antara*, X, 2, in which the original *r* of *antar-* is preserved (cf. §68).

8. *-am > -u* or *-a*, as in Apabhraṁśa. For many examples, see declension as above (§§158, 161). So we have *ēva* (*ēvam*), XII, 1.

9. *-aya > ē* in causal verbs. See §261.

10. *ā > a-* in *akamēya* (*ākramayati*), V, 5.

11. *-ā* and *-ā > -a-* in *kamathu* (*kramārtham*), XII, 6; *mahakama-* (*mahākrama-*) X, 1; *mahajana* (*mahājanah*), XIV, 1; *mahadyu* (*mahādēvaḥ*), IX, 6; *mahanaya-* (*mahā*), XIV, 1; *mahabhūta* (*mahābhūtāni*), VII, 8. It will be observed that, with one exception, all these occur in the word *mahā*.

12. *-ā > -a* regularly in feminine nominatives singular (§162). So also in *phūja-* (*phūjā*), XII, 3.

13. *-ā > -i* or *-ī*. This occurs in a few feminine nominatives in *-ikā*: *āsānī*, (*āśyānikā*), II, 5; *ahālī* (*ahalikā*), I, 4; *kisī* (*kṛsikā*), I, 3; *nāsī-* (*nāsikā-*), VI, 2;

¹ Not *hṛd-padma-*, see §77.

samāñi (*samāñikā*), III, 2; *sāmāñi* (*sāmāñyikā*), XI, 5. The presence of the *ñ*, instead of *n*, in these forms shows that the original terminations must have been *-ikā*, the development having been, e.g., *āsyāñikā* > *āsāñiā* > *āsāñi*. The last is the direct original of a Mod. Ksh. form *āsōñ* " (i.e. *āsāñ*"). Similarly *-ēyā* has become *i* in *nākhyi* (*anākhyēyā*), III, 6 (see §1). Also, see below under *n* > *ñ* (§46).

14. *-ā->-ō-*. This is the regular rule in Mod. Ksh. when *ā* is epenthetically affected by a following *u*. In this book, only one sporadic example apparently occurs, viz. *vōtu* (*avāptam*), X, 1, as compared with *vātō* (also *avāptam*), XIII, 1. It should, however, be observed that in most Mod. Ksh. MSS., except those written since the spelling of Kāshmiri was fixed by Īśvara Kaula at the end of the last century, make no attempt to indicate this epenthetic change in writing, leaving the reader to pronounce the epenthesis when it occurs. Thus, most old MSS. have *wātu*, when they mean the word to be read *wōt*". The existence of this one word *vōtu* in our work, shows that the same epenthetic pronunciation of *ā* as *ō* prevailed in Kashmir in Śitikaṅṭha's time, and no doubt every *ā* occurring in the book, when followed in the next syllable by *u*, should be pronounced as *ō* or *ō*. The occurrence of *vōtu* in an isolated passage is no doubt due to the scribe, by a happy carelessness, recording the word as it sounded to his ears, and not as it was etymologically spelt.

15. *-i->-a*. This occurs in certain third persons singular of the present tense, as in *asta* (*astī*), III, 3. For other examples, see §232. It also occurs in unaccented syllables of certain words, such as *gaṇḍāgaṇḍa-* (*granthāgranthi-*) II, 6; *satta-* (*sakti-*), I, 3; VII, 8; *thita-* (*sthiti-*), XIII, 2; *samhita-* (*samhyti-*), XIII, 2. In *siṣṭi-* (*siṣṭi-*), II, 6a, the *i* has remained unchanged.

The termination *-ikā*, as seen above (§13), usually becomes *ī*, but in the following cases (possibly sTss.) it is preserved as *-aka*: *gāsaka* (*grāsikā*), I, 3; *nāyaka* (*-ikā*), VII, 1; *vyāpaka* (*-ikā*), I, 4.

16. *-ih->-a* or *-i*. It becomes *a* in *āhuta* (*āhutiḥ*), XI, 6; *upṣatta* (*utṣattiḥ*), VI, 4; *ūma* (*ūrmiḥ*), II, 5; *satta* (*saktiḥ*), I, 4; XI, 1, but cf. *satti*, below; and several others given in §163. On the other hand, the termination *-ih* remains as *-i* in *utti* (*uktiḥ*), XII, 7; *bahi* (*bahiḥ*), III, 5, 9; X, 3; *satti* (*saktiḥ*), III, 5, cf. *satta*, above.

17. *-im->-a* in *mata* (*matim*), IV, 6.

18. *-ī->-a* in *idyāsa* (*-sī*), II, 8; *khēcara* (*-rī*), V, 3; *dūta-* (*dūtī-*), XIII, 5; *dēva* (*dēvi*, cf. *dēvi*, below), IV, 5; *pithiva-* (*ṣṭhivi-*), II, 6a; and many others given in §163.

19. *-ī->-i*. We have above seen that in IV, 5, *dēvi* becomes *dēva*, but, in IV, 6, it becomes *dēvi*. So, in VII, 2, *vyndī* has become *vyndi*. Both are clear Tss.

20. *-ī->-ē-*. In Mod. Ksh. *ē*, though written, is pronounced as *ī*. So, in I, 3, we have *nērāji* < *nērājikē*.

21. *-u->-a* in *vasta* (*vastu*), III, 3.

22. *-u->-a* in *dugañārē* (*dviguṇitēna*), III, 3; *makurasa* (*mukurasya*), II, 3. In

the former, there has been confusion with *gana*-. The latter is merely a borrowed Prakrit form.

23. *u*->*o*-. In Mod. Ksh. *u* and *o* are freely interchanged, and in common pronunciation their sound is the same, viz. that of *u*. So, in IV, 1, we have *odḍiyānu* for *udḍiyānam*.

24. *-ū*->*-a*- in the word *cahēta* (*cūṣitvā*), XII, 4. In Mod. Ksh. Tss. *ū* is represented by *ū*, as in *mūrkh* (*mūrkhah*), a fool. But in Tbhs. or sTss. it becomes *u*, as in *m^uth^r* (*mūtram*), *s^uth^r* (*sūtram*), and the *√r^ud-* (*rūḍhībhavanē*). So also, from this very *√cūṣ-*, we have the Mod. Ksh. *ts^uh-* (*cūṣē*). From the occurrence of this last under the form of *√cah(ēta)*, we see that this change of *ū* to *a* is old. In two cases, the letter *-ū-* appears to correspond to the *ū* of Mod. Ksh. Tss. These are *viḥayūna* (*viḥayatām*), I, 4, and *anumūha* (*anumiyatē*), VII, 6, which rhymes with the word *cuvīha*. In Mod. Ksh. the sound of *ū* is that of a much prolonged German *ü*, and often approaches that of *i*. So much is this the case that when Mod. Ksh. is written in the Persian character, this sound is represented by *ی*. For *viḥayūna*, see §238, and, for *anumūha*, see §234. Cf. also *pūjūji* in §258.

25. *ḥ*->*ri*- as in Prakrit, as in *rijjī* (*ḡddhīḥ*), XI, 9.

26. *-ḥ*->*-i*- in *kattiku* (*kartḥkah*), II, 2; *kiḥthu* (*ḥḡrtham*), XIV, 1; *kiṣi* (*ḥḡśikā*), I, 3a; *tina-* (*trṇa-*), IV, 3; *diṣṭi* (*drṣṭyā*), V, 5; *ḥithiva-* (*ḥṡthivī-*), II, 6a; *ḥakiti-* (*ḥrakyti-*), VII, 7; *vitta* (*vrṡtam*), XII, 2; *vitti-* (*vrṡti-*), IV, 3; *viccī* (*vrṡtyā*), X, 2; *vindu* (*vrṡdam*), VII, 1; *samiddha* (*samrḡddhā*), VIII, 2a; *samḥiti-* (*samḥṡti-*), VI, 5; VIII, 1; X, 6; *samḥita-* (*samḥṡti-*), XIII, 2; *siṣṭha* (*srṡṡṡh*, the *ṡh* being used instead of *ṡ* (§37) to provide a rhyme for *niṡṡha*), III, 5; *siṡṡti-* (*srṡṡti-*), II, 6a; VI, 5; X, 4, 8; XI, 7; XIII, 2; *ḥiṡō* (*srḥṡah*), IV, 3; *ḥiṡandu* (*srḥṡantah*), IV, 3; *ḥiṡi* (*srḥṡē*), V, 4. I have not noted any instances in which *ḥ* becomes *a* or *u*, as often happens in Prakrit.

27. *-ḥ*->*-i*- in *kitta* (*ḥḡṡtā*), V, 1; X, 2.

28. The vowel *ē* generally remains unchanged, but we have the contraction *dyu-* for *dēva-* in V, 7. Also:—

29. *-ē*->*-a* in *kṡana* (*ḥṡaṡē*), VII, 4.

30. *-ē*->*-i* very often in locatives singular, as in *ḡdayi* (*ḥḡdayē*), XII, 5, and many others given in §184.

31. *-ē*->*-a*- in *āvasu* (*āvēṡam*), XII, 1; *dēvandē* (*dēvēndrēṡa*), VI, 3.

32. The vowel *ō* is generally preserved, but:—

-ō->*-a*- in *ḡlavānē* (*adōḡāyamānāḥi*), XII, 6. The same change occurs in the Mod. Ksh. *ḡlavu*, to be moved.

33. *-au*->*-ō*- in *divyōḡu* (*divyaughḡ*), VI, 5. The word *gauravam* in Prakrit becomes *gōravam*, *gauravam*, or *gāravam* (Mk. i, 51). Here, in II, 3, we have *guravvama*.

34. **Vowel-Metathesis.**—A good example of vowel-metathesis is *yida* (*yadi*), V, 6 (*ḡida* of the printed text being a misprint). The metathesis was helped by the semivowel *ya* being pronounced as *yē* or *yi* as is the case in Mod. Ksh.

35. To sum up the treatment of vowels. This is, with sporadic exceptions, the same as in Apabhramśa. Aphesis, especially of *a*, is common. Final, or otherwise

unaccented, *i* or *u* tends to become *a*. The vowel *ū* is unstable. Sometimes it becomes *a*, corresponding to the Mod. Ksh. *a*, and sometimes it was probably sounded like the Mod. Ksh. *ū*. It may here be noted that in Mod. Ksh. *ū* and *a* are liable to interchange. Thus, we have *tūrū* or *tūrū* (i.e. *tārū*) (< **tuhāriā* < *tuṣārikā*), cold. As in Mod. Ksh., *ī* and *ē* and *u* and *ō* are freely interchanged. So also we have an instance of the Mod. Ksh. epenthetic change of *ā* to *ō*, and there are no doubt many other similar epenthetic changes not indicated in writing. In other respects, the vowel-changes are generally as in Apabhraṃśa.

CONSONANTS.

36. **Disaspiration.** As a rule, original sonant aspirates are written as such, but probably they were uniformly pronounced with disaspiration. This is the case in Mod. Ksh., in which original sonant aspirates are usually written as such by Paṇḍits, although they teach that the aspiration has disappeared in pronunciation. Even when speaking Sanskrit, they commonly omit the aspiration, and exhibit evident difficulty in sounding it when specially asked to do so. Thus, they pronounce such a word as *ghaṭaḥ* as *gaṭaḥ*. This fact is specially stated by Īśvara Kaula for Mod. Ksh. He says in the very first words of his *Kāśmīra-sabdāmṛta*, "*Tatrādau kāśmīra-bhāṣāyām varga-catvṛthāḥṣarāṇi kvacin nōccāryantē.*" That the author or, at least, the scribe of our text also habitually pronounced such letters without aspiration is shown by a few cases in which he has carelessly omitted it in writing. Thus: *gōnāna* (*ghōnānām*), VI, 2; *divyōgu* (*divyaughah*), VI, 5; *jamṇi* (*jhamṇayā*), VI, 2; *vviccī* (*ṛviccī*) (*bhiltiyā*), X, 2; *vaḍḍā* (*vēṣṭayitvā*, Prakrit ✓*vēdh-*), IV, 6; *surandi* (*svarandhrē*), XI, 7, but *randhri* (*randhrē*), VII, 6; *dari* (*dharati*), VIII, 2. How little attention was paid to the aspiration of sonant letters is shown by the word *vidhāvana* (*vidhāraṇi*), I, 4, in which the *d* has been written *dh* merely to provide a graphic rhyme for *bōdhāvana* (*bōdhāraṇiḥ*) two lines higher up. Evidently *d* and *dh* were considered to have the same sound.

37. Even with surds, the aspiration cannot have been strong, for, in XII, 6, we have *ukkiṣṭa* (*utkṣṭāḥ*) rhyming with *niṣṭha*, while, on the other hand, in III, 5, *siṣṭa*, (*ṣṣṭiḥ*) is altered to *siṣṭha*, to make it a graphic rhyme with the same word. Again in *kaṇu* (*kaphah*), II, 7, *ph* has become *p*, without the excuse of the necessities of rhyme. These instances could not have occurred if the aspiration had been as strong as in India proper. It may be observed that at the present day, in the Pañjāb, sonant aspirates are commonly sounded without aspiration, an acoustic tone being given to the syllable in compensation.¹ So, in the Śiṅā language, which is closely allied to Ksh., the root *khā-*, eat, has been recorded as *kā-* by some observers, while others hear *khā-*, the latter again differing in their accounts of the intensity of aspiration. In my personal experience of Ksh., after discussing the language every day for more than a year with a Kāśmīri Paṇḍit, there was much the same effect. Being accustomed for many years to the clearly sounded aspiration common in the lower Ganges Valley, I

¹ See T. F. Cummings and T. Grahame Bailey, *Panjābi Manual and Grammar*, pp. xviii., 17ff.

often found it difficult to tell whether my Paṇḍit was aspirating his surds or not, and I was told that the same difficulty was experienced by natives of Patna with whom he had occasion to speak in Sanskrit or Hindōstāni.

Single Initial and Intervocalic Consonants.

38. *-k-* is elided in *bārōṭhē*, by a porch, VI, 3, derived from *dvāra(pra)kōṣṭhēna*. The word has survived in the Mod. Ksh. *brūṭh'* or *brōṭh*, before.

39. *-c-* is elided, and *y* inserted in its place, in *lōyana-* (*lōcana-*), II, 7; and *vayana* (*vacanam*), XII, 5.

40. *-th-* is softened to *-ḍ-* (disaspirated) in *haḍa-*¹ (*haṭha-*), III, 7. This is the Tbh. form of the word. The Ts. form appears in the *haṭha-* of II, 7.

41. *-n-* appears occasionally as *-n-* in such words as *karankina* (*karankiṇi*), VII, 2; *vidhārana* (*vidārāṇi*), I, 4. Generally, however, it is preserved in writing Ts. words. In Tbh. words it always > *n*, as in *nirvāna-* (*nirvāna-*), IV, 7; *karana* (*karanam*), XII, 4, and others.

42. *-t-* is very frequently elided. This is especially the case in the present 3rd sing. of verbs, in such words as *pasari* (*prasarati*), VIII, 2, and *diṣṣi* (*dṛṣyatē*), IX, 7. In such cases *-ali* or *-atē* has become *-i*. Many other examples will be found in § 231. Also *-t-* is elided in past participles such as *gau* (*gataḥ*), VI, 1, and others given in §§ 248ff. In most cases, *y* is inserted in its place, as in *ankuriya* (*ankuritā*), III, 5, and others given in § 250. In *jaga* for *jaḡati*, X, 7, we have really an instance of the apocope of final *-t*. See below (§ 55).

While, in V. 1, we have *thiya-* for *sthita-*, in two cases we find the *y* doubled in this word, apparently *metri causa*. They are *thiyya* (*sthitāḥ*), II, 6, and (*sthitā*), XII, 3. In one case, *-vitatta* (*vitatiḥ*), II, 8—an intervocalic *t* has been doubled, instead of being elided. This was to make the word rhyme with *niṣpatta* in the same verse. Below, we shall notice the same thing happening to a final *t* (§ 55).

43. *-t-* is softened to *d* in *cidi* (*citi*) XII, 4; *padipātō* (not *paḍi*^o, as in Prakrit) (*pratipātam*), XIII, 1. Usually, as we shall see (§ 55), a final *t* is apocopated, but in the monosyllable *cit* (see below) it becomes *d*. Hence we get *cidi* above.

On the other hand, *-t-* is often preserved, even in Tbhs. Examples are *ugghātu* (*udghātaḥ*), II, 1; *vyugata-* (*vyudgata-*), XII, 7, and several others given in § 247.

44. *-d-* is elided, with *y* substituted, in *uyavāṇi* (*udayavatyā*), XI, 2; *vāha-* (*dvādaśa-*), IX, 1.

45. *-d-* > *-ḍ-* in *mēḍa* (*mēdaḥ*), II, 7; *ḍalavānē* (*adōlāyamānāḥ*), VI, 5. Here we have an example of the weak sense of the difference between cerebrals and dentals which is a marked feature of Dardic languages.

46. *-n-* > *-ñ-*. This is explained above in § 13. When *-n-* is followed by an original *v* or by an original palatal vowel, it regularly becomes *ñ*. It is the same in Mod. Ksh.

47. *-ḥ-* > *-v-* in *kṣavanō* (*kṣapaṇam*), XII, 2; *pāvēna* (*prāpāyanti*), X, 3; *pāvēya* (*prāpāyati*), IV, 5.

¹ Written *hara-* in my MS. This is the present day Śrinagar pronunciation.

48. *-m-* > *-v-* (cf. Apabhraṃśa *ṅ*) in *gavana* (*gamanam*), III, 4. In *kammu* (*kramah*), X, 3, *m* has been doubled *metri causa*. The usual form of the word is *kamu*, see §104.

49. *v-* remains unchanged, except in *bindu* (*vindasva*), VIII, 3.

50. *-va-* (or *-va*) > *-u-* (or *-u*). This, with variants, occurs in Tbhs. Thus, *bindu* (*vindasva*), VIII, 3; *surandi* (*svarandhrē*), XI, 7. So *-ava-* in *bhairu* (*bhairavah*), VI, 3, cf. I, 3. In *bhayana* (*bhavanti*), XI, 7, intervocalic *v* has been elided, and a *ya-sruti* inserted in its place. But *uva* > *ū* in *bhōnāna* (*bhuvanānām*), III, 4, and *ēva* > *yū* in *dyu* (*dēvah*), IV, 2; V, 6; IX, 6.

51. *s-* and *-s-* both > *h* in *harira* (*sarirē*), translated *vapuṣi* in the Comm., while we have the Ts. *śarira* in the same verse (XII, 3). So *aṣṭadaha* (*aṣṭadaśa*) and *cuddaha* (*caturdaśa*), both in XI, 3; *vāha* (*dvādaśa*), IX, 1; X, 8; but *bāh* in Mod. Ksh., and so *bāhi* (*dvādasabhiḥ*), VII, 3; *pañcadahi* (*pañcadasabhiḥ*), IX, 3; *pañcadahēya* (*pañcadasa-bhīrēva*), XI, 7.

Similarly *-mś-* > *h* in *savvīha* (*śadvīmśatiḥ*), XI, 4; *trētrihi* (*trayastrīmśatā*), IX, 4.

52. The treatment of *ṣ* is not consistent. Sometimes *ṣ-* and *-ṣ-* > *ś*, and sometimes *-ṣ-* > *-h-*. Thus, *ṣ-* > *ś-* in *savvīha* (*śadvīmśatiḥ*), XI, 4; *saṇḍa-* (*saṇḍa-*), VI, 2; *-ṣ-* > *-ś-* in *ciśā* (*tviṣām*), VI, 1;

-ṣ- > *-h-* in *cahōta* (*cūṣitvā*), XII, 4; *pañcahaṣṭa-* (*pañcaśaṣṭa-*), IX, 1, 2, 4; X, 8; XI, 4; *cuhaṣṭa-* (*catuṣṣaṣṭa-*), IX, 2, 4.

Single Final Consonants.

53. *-k* > *-ga* in *tiryaga* (*tiryak*), II, 6a.

54. *-h* is elided in *samya* (*samyak*), X, 7.

55. *-t* is elided in the ablative singular masculine of *a*-bases, as in *analā* (*analāt*), XI, 4, and others given in §176. Also in *yāva* (*yavat*), VII, 5; *jaga* (*jagat*), IV, 4, cf. loc. sing. *jaga* (*jagati*), X, 7.

-t > *-tta* in *samvitta* (*samvit*), X, 2, to rhyme with *kitta* (*klptā*) in the same verse.

-t > *-da* in *cida* (*cit* and *cit-*), II, 3; III, 7; V, 4; VII, 9; XII, 1. Here, evidently, the final *t* has not been apocopated, because the word is a monosyllable. For the same reason, we have *ṛda-* (> *hṛt-*), XII, 3. The same explanation will not explain *samvida* (*samvit*), III, 2. Cf., however, *samvitta*, above. This word is apparently a sTs.

Conjunct Consonants. Class-consonants.

56. As in Prakrit and Apabhraṃśa, the first consonant is assimilated to the second. Thus:—

57. *-kt-* > *-tt-* in *utti* (*uktiḥ*), XII, 7; *bhuttē* (*bhuktē*) XII, 2; and in *satta*, *satti*, and other numerous forms under which the word *śaktiḥ* occurs (I, 3, 4; II, 6a; III, 5; VI, 1; VII, 8; VIII, 3, 4; IX, 3; X, 6; XI, 1). Similarly, we have *sāttā*¹ (*śāktāyāḥ*), VIII, 1.

58. *-tk-* > *-kk-* in *ukkiṣṭa* (*utkṣṭāḥ*), XII, 6.

¹ The *sāttā* of the printed text is probably a misprint. My MS. has clearly *sāttā*.

59. *-ṭp-* > *-ṣp-* in *upṣatta* (*uṣṭāṭh*), VI, 4; *ṣṣpada-* (*hyṣpada-*), VIII, 2a, see §4.

60. *-tth-* > *-th-* in *ittha* (cf. *ittham*), III, 4. See §223.

61. *-dḡ-* > *-g-* in *vyugata* (*vyudgatā*), XII, 7.

62. *-dḡh-* > *-gh-* (i.e. *-g-*) in *jagaghasmaru* (*jagadghasmaram*), I, 3. This is a Ts. compound of *jaga* (for *jagat*) and *ghasmaru*.

63. *-dḡh-* > *-ggh-* (i.e. *-gg-*) in *ugghātu* (*udghāṭh*), II, 1.

64. *-dbbh-* > *-bbh-* (i.e. *-bb-*) in *ubbhāvē* (*udbhāvēna* or *udbhāvvyatē* III, 4; *ubbhāvō* (*udbhāvīṭh*), XIII, 6; *sabbhāvē* (*sadbhāvēna*), V, 2; VI, 1.

65. *-ṣt-* > *-tt-* in *kitta* (*kṣṭā*), X, 2; *ṣatta* (*prāṣṭīṭh*), X, 1; *vatta* (*vyāṣṭīṭh*), VI, 4; *satta* (*saṣṭā*), VI, 4; X, 7.

66. *-ṣt-* > *-t-* in *vāṭō* (*avāṣṭam*), XIII, 1; *vōṭu* (*avāṣṭam*), X, 1. See §14.

Nasal Conjuncts.

67. (a) If the nasal precedes, the conjunct is generally unchanged, but most cases are Tss. A few examples, out of many, are:— *aṅga-* (id.), V, 5; *aṅḍa-* (id.), VIII, 4; *anta-* (id.), III, 2; *bindu-* (id.), XIII, 3; *kampana* (*-nam*), III, 1; *amba* (*ambā*), III, 9. There are, however, Tbh. exceptions. Thus:—

68. *-nt-* > *-nd-* in *andara* (*antarē*), III, 9, but this may be Eranian: *ṣisandū* (*ṣṣyasantah*), IV, 3.

69. *-nti-* regularly > *-na-* in the third person plural of verbs. Thus, *avatārēna* (*avatārayanti*), X, 1, and others given in §236.

70. *-nth-* > *-ṇḍ-* (not *-ṇṭh-* as in Prakrit) in the word *gaṇḍāgaṇḍa* (*granthāgranthi*), II, 6.

71. For *-ndr-* and *-ndhr-*, see under *r*-conjuncts, below (§109).

72. (b) If the nasal follows, we have the following changes:—

73. *-gn-* > *-gg-* in *tulaggu* (*tallagnaḥ*), II, 2, and *lagga* (*lagnā*), II, 5.

74. *jñ-* > *ñ-*, as in Paisāci Prakrit, in *ñāna-* (*jñāna-*), VI, 1; VII, 2, 3, 5; VIII, 6; X, 5, 6; *ñānu* and *ñāna* (*jñānam*), II, 4; V, 2; VII, 4; *ñānasa* (*jñānasya*), III, 3; *ñāna-ñēyu* (*jñāna-jñēyam*), III, 8; *ñānaci* (*jñānasya*), X, 2.

75. *-ṣna-* > *-nu-*, with compensatory lengthening of the preceding vowel in *svānu-* (*svaṣna-*), X, 5. If the word is correct, the final *u* is perhaps due to the presence of the original *ṣ*; but, in my opinion *svānu-* is a scribal error for the Ts. *svaṣna-*. It would not be difficult to confuse *ānu* and *ṣna* in the Śāradā character.

76. *-tm-* > *ṣ* in numerous forms of *ātman-*, as in *āṣa-* (*ātma-*), V, 7; *āṣā* (*ātmā*), IV, 4; *āṣā* (*ātmanah*), VIII, 6; *āṣi* (*ātmani*), III, 8.

77. *-dm-* > *-mm-* in *ṣamma-* (*ṣadma-*), XI, 7; *ṣammā* (*ṣadmāt*), VIII, 2a.

78. *-rm-* > *-mm-*. For this, see under *r*-conjuncts, below (§98).

79. (c) Of conjuncts of two nasals, each of a different class, there are the following examples:—

-nm- > *-mm-* in *cimmaya* (*cinmayah*), XII, 1; *jammu* (*janma*), XIV, 1.

-nm- preceded by a long vowel > *-m-* in *nīddhāmi* (*nīrdhāmi*), XI, 4; *dhāmi* (*dhāmi*), III, 6; XI, 1.

Semi-vowel Conjuncts.

80. (a) If the semi-vowel is *y* :—

-*khyēyā*- > -*khyi*- in *nākhyi*- (*anākhyēya*-), XIII, 2; (*anākhyēyā*), III, 6.

81. *iy*- > *j*- in *jēthi* (*jyēṣṭhā*), II, 4; so *jēthyu* (*jyēṣṭhābhik*), VIII, 5.

82. -*ty*- exceptionally > *tt* in the sTs. *paṭṭēkasa*¹ (*pratyēkasya*), X, 7. Usually *ty* > *cc*, as in Mod. Ksh. it becomes *ts*, even in the declension of Ksh. words. Thus, in the Mod. Ksh. *toṭ*^u, hot, the base is *tat*-. If we add to this the suffix *yar*, forming abstract nouns, we get, not *tatyar*, but *tatsar*, heat. Of the change of a simple *ty*, I can quote only one doubtful example,—*yaccī* (? *yatyā*), X, 4; but there are several examples of more complex conjuncts. Thus :—

-*kty*- > -*cc*- in *saccī* (*saktyāḥ*), II, 1; IV, 1; VII, 3, 9; VIII, 6.

-*tty*- > -*cc*- in *ruccī* (**ruttyā*), II, 1; *viccī* (*vṛttyā*), X, 2; *vicyu* (for **vittyu* < *vṛttibhiḥ*), X, 5; *viccī* (probably incorrect for *biccī* < *bhittyā*), X, 2.

-*rtty*- > -*c*- in *mūcī* (*mūrtyāḥ*), IX, 6.

In one case, *ty* apparently becomes *d*. It is *nidu* (XII, 5), which the Comm. translates by *nitya*-. If the two words are really connected, *nidu* (*nityam*) must be a sTs., through **nitam* for **nittam* (see Pischel § 281).

Similarly :—

83. -*dy*- > -*j*-, -*jj*- (= Mod. Ksh. *z*) in *ājī* (*ādyāḥ*), III, 4; *ājyu* (*ādyaiḥ*), IX, 1; *yājī* (*yādyāḥ*), VIII, 2, and *sājī* (*sādyāḥ*), VIII, 1; *sāpajji* (*sāmpadyatē*), XII, 2; and

84. -*dhy*- > -*j*-, -*jj*- in *riji* (*ṛddhiḥ*, through **ṛddhyah*), XI, 9; *maja*- (*madhya*-), V, 3; *majjā* (*madhyāt*), II, 8; III, 3.

85. -*ny*- > -*ñ*-, -*ññ*-, as in Paisācī Prakrit, and as in Mod. Ksh. Thus, *aña*- (*anya*-), VIII, 6; *jañi* (*javyēna*), XIII, 3; *sāmāñi* (*sāmānyikā*), XI, 5; *añña* (*anyā*), X, 6.

86. -*dbhy*- apparently > -*p*- in *āpā* (*adbhyah*), II, 6a, but this is not really the case. The word *āpā* is a secondary formation. An *a*-base, *āpa*-, has been formed from the Sanskrit base *āp*-, and *āpā* is the regular ablative singular of *āpa*-. See §§ 176, 177, below.

87. -*ry*- > -*j*-. For this, see *r*-conjuncts, below (§ 99).

88. -*vy*- > -*v*- in *bhāvi* (*bhāvyaṭē*), IV, 7.

89. (b) If the semivowel is *r* :—

(i) If the *r* precedes :—

-*rg*- > -*g*-, -*gg*- in *māgē* (*mārgēna*), VIII, 4; *vaggyu* (*vargaiḥ*), VIII, 1; *sagga*- (*sarga*-), II, 8; XII, 7; *saggu* (*sargah*), II, 2; XIII, 3.

-*rgḥ*- > -*gg*- in *aggu* (*argham*), XIII, 3.

-*rgḥ*- > -*gh*-, -*ggh*- in *digha*- (*dīrgha*-), VII, 7; IX, 3; *nigghātu* (*nirghātaḥ*), II, 1. As explained under the head of aspiration (§ 36), these are probably graphic representations of words with -*g*-, -*gg*-.

90. -*rc*- > -*cc*- in *accana*-² (*arcana*-), XIII, 3.

91. -*rj*- > -*jj*- in *vajjēta* (*varjayitvā*), X, 5; XII, 5.

¹ *paṭṭēkasa* of the printed text is a misprint.

² The *accana*- of the printed text is due to the copyist's mistake. In Ksh. MSS. the signs for *śca* and *cca* are over and over again confused. Thus *uccaiḥ* is usually written *uścaih*.

92. *-rṇ-* > *-n-*, *-m-* in *pūna-* (*pūrṇa-*), XI, 6; *pūnyu* (*pūrṇaiḥ*), XIII, 6; *vanna-* (*varṇa-*), I, 5; II, 5; IX, 4; X, 2; XI, 6; *vanna* (*varṇaḥ*), X, 6; *vannu* (*varṇaḥ*), VIII, 5; *vannāna* (*varṇānām*), IV, 4; *vannyu* (*varṇaiḥ*). X, 4; *vanyu* (*varṇaiḥ*), X, 5.

93. *-rt-* > *-t-* in *kattiku* (*kartṭkaḥ*), II, 2.

-rtm- > *-t-* in *vatu* (*vartma*), IX, 7 (Mod. Ksh. *wat-*).

94. *-rth-* > *-th-* in *kitāthu* (*kṛtārtham*), XIV, 1; *kamāthu* (*kramārthah*), XI, 2; but *kamathu*¹ (*kramārtham*), XII, 6; *padāthu* (*padārthah*), VI, 1; XII, 2; *paramāthu* (*paramārthah*), XII, 2; and so, III, 9; IV, 7; V, 7; XIV, 1; *mahāthu* (*mahārthah*), I, 5; III, 8; and so, IV, 7; XII, 7; XIII, 6; *sāthu* (*sārthah*), VI, 1.

95. *-rdh-* > *-dāh-* in *middhāmi* (*nīrdhāmi*), XI, 4. Here *dh* is probably graphic for *dd*.

96. *-rdhv-* > *-d-*, *-dh-* in *ūda-* (*ūrdhva-*), VIII, 2a; *ūdhiadha* (*ūrdhvādhaḥ*), VIII, 2. Here, again, *dh* is probably graphic for *d*.

97. *-rpy-* > *-pp-* in *tapṭōha* (*tṛṇpyatē*), VI, 3.

98. *-rm-* > *-m-*, *-mm-* in *ūma* (*ūrmiḥ*), II, 5; *kammēndriya-* (*karmēndriya-*), V, 2.

99. *-ry-* > *-j-* in *pūji* (*pūryatē*), V, 7; VI, 4.

100. *-rl-* > *-ll-* in *nillakṣi* (*nīrlakṣyē*), X, 8.

101. *-rv-* > *-vv-* in *cavvēna* (*carvayanti*), X, 4; *cavvēta* (*carvitvā*), VI, 3; *nivvāna-* (*nīrvāna-*), IV, 7; *savva-* (*sarva-*), IV, 7; V, 2; X, 6; XI, 8; *savva* (*sarvam*), XII, 5.

102. *-ršt-* > *-t-* in *patla*, behind, which must be compared with the Avesta *paršti-*. The Comm. equates the word with *paścāt*, but the change of *-śc-* to *-t-* is impossible. This is another instance of a Ksh. word derived from an Aryan word which is not Indo-Aryan.

103. We have instances of *svarabhakti* in sTss. in :—

-rd- > *-rad-* in *antaradiśa* (*antardasā*), X, 2.

-rś-, *-rṣ-* > *-riś-* or *-raś-* in *nighariśā*² (*nigharśāt* or *nirgharśāt*, Comm. *saṃgharśaḥ*), II, 5; *parāmariśc* (*parāmarśēna*), III, 5; *paraśu* (*sparaśaḥ*), XII, 1; *pariśa-* (*sparaśa-*), VI, 1.

104. (ii) If the *r* follows :—

kr- > *k-* in *kamu* (*kramaḥ*), II, 3; and so, III, 2, 9; IV, 7; VI, 3 (*bis*); VII, 3; VIII, 1; IX, 1; X, 1, 4, 5; XI, 2, 5, 6; XII, 5, 6 (*bis*); XIII, 3, 4, 5; XIV, 1; *kiyā* (*kriyā*), VI, 1; VIII, 6; *kōdha* (*krōdhaḥ*), II, 7.

105. *-kr-* > *-k-*, *-kk-* in *akamēya* (*ākramayati*), V, 5; *akamu* (*akramaḥ*) X, 3; and so, XI, 2; *akkamu* (*akramam*), XII, 5; *cakka-* (*cakra-*), I, 4; and so, I, 5; IV, 3; V, 3; VI, 4; XI, 3; XII, 3; XIII, 5.

106. *gr-* > *g-* in *ganthi* (*granthē*) : ३ VII, 9; *gāsa-* (*grāsa-*), VII, 3; *gāsu* (*grāsam*), XI, 8; *gāsaka* (*grāsikā*), I, 3; V, 3; VIII, 6; (*grāsakaḥ*), IV, 3.

¹ The metre,—15 mātrās to a line—indicates that *kamathu*, with a short penultimate, is correct. The line is *ēhu kamathu bhajiva nayanisṭha*. If we read the first *ē* of *ēhu* as short, then *kamathu* would have to be *kamāthu*. Such a shortening is quite common in Hindi poetry, and apparently occurs in XII, 4.—*Ahēcarina ehu vallahathāvu* (also 15 mātrās). Elsewhere (II, 8; XI, 1), the *ē* of *ēhu* and *ēha* appears to be long.

² The *nippariśā* of the printed text is a misprint.

107. *-ñkr-* > *-ñk-* in *sañkama-* (*sañkrama-*), XIII, 1; and so, X, 2; *sañkamayō* (*sañkrāntak*), II, 3.

108. *tr-* > *t-* in *tōdaśa* (*trayōdaśi*), X, 7; *tōdaśami* (*trayōdaśē*), IV, 3.

-tr- > *-tt-* in *matta* (**mātrā* for *māṭṭkā*), X, 6.

109. *-dr-* > *-d-* in *-mudu* (*-mudram*), VII, 2.

-ndr- > *-nd-* in *canda-* (*candra-*), VIII, 4; *candā* (*candrāt*), VI, 4; VIII, 3; *dēvandē* (*dēvēndrēna*), VI, 3.

-ndhr- > *-nd-* in *surandī* (*svarandhrē*), XI, 7; but *randhri* (*randhrē*), Ts., VII, 6.

110. *pr-* is often retained, probably by scribal carelessness. A good example is *aprasarā* (*aprasarāt*), VIII, 2a, with *pasara-* (*prasara-*), in the same verse. But generally:—

pr- > *p-*, as in *pakāru* (*prakāram*), VII, 2; *pakārē* (*prakārēna*), IX, 3; *pakāśa-* (*prakāśa-*), VI, 4, 5; *pakāśu* (*prakāśah*), XIII, 5; *pakiti-* (*prakṛti-*), VII, 7; *panava-* (dental *n*) (*pranava-*), IV, 2; *paṭibhōgē* (*paṭibhōgēna*) (note that here, and elsewhere, *paṭi* does not become *paḍi*), XIII, 2; *paṭiviccī* (*paṭivṛṭṭiyā*), VII, 9; *paṭṭa* (*prāṭṭih*), X, 1; *paṭṭēkasa* (*praṭyēkasya*), X, 7; *paṭhama-* (*prathama-*), II, 1; *paṭhyōha* (*prathyatē*), XII, 7; *papañcu* (*prapañcaḥ*), XI, 2; *pabhāvē* (*prabhāvēna*), VII, 5; *pabhūsa* (*prabhōh*), XIV, 1; *pamānē* (*pramānēna*), VIII, 3; *palaya-* (*pralaya-*), IX, 4; XI, 1; *paviśēta* (*praviśya*), VIII, 4; *pavēśē* (*pravēśēna*), XII, 3; *paśama-* (*praśama-*), VIII, 5; *pasaru* (*prasarah*), II, 4, 6a; and so, V, 4; VIII, 2a; *pasau* (*prasṛtā*, see § 249), X, 6; *pasādē* (*prasādēna*), XIV, 1; *pānē* (*prānēna*), II, 2; and so, II, 7; IV, 6; *pāvēya* (*prāpayati*), IV, 5; *pāvēta* (*prāpya*), III, 8; VI, 3; *pēkṣēta* (*prēkṣya*), IV, 6.

-pr- > *-p-* in *apabōdhu* (*aprabōdhaḥ*), II, 3.

111. We have *svarabhakti* in *parāvēna* (*prāpayanti*), VIII, 4; but *pāvēna*, X, 3; *parasūta* (*prasūtih*), VII, 8; *parasiddha* (*prasiddhā*), VIII, 2a; *parivāhāna* (*pravāhānām*, with intrusive *i*), III, 7. In the last there has been confusion with *pari*.

112. *bhr-* > *bh-* in *bhāji* (*bhrājatē*), X, 7.

113. (c) If the semivowel is *l*:—

-kl- takes *svarabhakti* in *akalēśē* (*aklēśēna*), IV, 5.

114. *tall-* > *tul-* in *tulaggu* (*tallagnaḥ*), II, 2. I am unable to account for the presence of *u*. The translation *tallagna-* is that of the Comm.

115. *plu-* > *pala-* in *palatyu* (*plutaih*), IX, 3. Here also we have *svarabhakti*, but the change of *u* to *a* is not explained.

116. *-rl-* > *-ll-*. See under *r*-conjuncts (§ 100).

117. (d) If the semivowel is *v*:—

ḷv- > *ḷ-* in *ḷalana-* (*ḷvalana-*), VI, 4.

-ḷv- > *-ḷj-* in *ciḷjalanē* (*ciḷjvalanēna*), IV, 3.

118. *-ḍv-* > *-v-*, *-vv-* in *śavanyu* (*śaḍvarnaiḥ*), X, 5; *savviha-* (*śaḍvimsati-*), XI, 4.

119. *twi-* > *ci-* (Cf. Pischel, § 299) in *ciśā* (*twiśām*), VI, 1; *ciśu* (*twiṭ*), VI, 3; Cf. *ci* < *twayā*, § 220.

-tv- > *-p-* in *pīṭhapano* (*pīṭhatvam*), IV, 2.

120. *dv-* > *v-*, *b-* in *vāha* (*dvādaśa*), IX, 1; X, 8; *bāhi* (*dvādaśabhiḥ*), VII, 3. Probably we should have *b* throughout. The Mod. Ksh. is *bāh*, twelve. The word

bārōṭhē (*dvāra*(*pra*)*kōṣṭhēna*), in front, VI, 3, is interesting. It survives in the Mod. Ksh. *brōṭh*, *brūṭhī*. But cf. *jū* < *dvau*, § 209.

dvi- > *du-*, *dau-* in *dugañārē* (*dviguṇitēna*), IX, 3; *dausaru* (*dvisarah*), II, 8.

121. *-rv-* > *-vv-*. See under *r*-conjuncts (§ 101).

Sibilant Conjuncts.

122. *-sc-* apparently > *-tt-* in *ṣatta* (= *ṣascāt*), II, 2; *ṣattasa* (? = *ṣascasya*), XII, 4. But this is really an instance of *-rṣt-* > *-tt-*. See § 102.

123. *śma-* > *ma-* in *maśāna-* (*śmaśāna-*), IV, 1; *miśāna* (*śmaśānam*), IV, 3. This sTs. word has passed through a stage *śimaśāna-*, with *svarabhakti* and a subsequent aphæresis of *ś* (through *h*). The Mod. Ksh. form is *shimshān* or *shumshān*, also a sTs.

124. *-śy-* > *-ś-*, *-śś-* in *āśāñī* (*āśyāñikā*), II, 5 (see § 13) : *diśśi* (*dṛśyatē*), IX, 7; *paśśu* (*paśya*), III, 8.

125. *-śr-* > *-ś-*, *-śś-* in *āśaya* (*āśrayam*), I, 3; *viśāmēta*¹ or *viśśāmēta* (*viśrāmya*, both in XII, 5. This pair, both occurring in the same verse, is instructive. The use of *ś* or *śś* is clearly due to the exigencies of metre. *Viśāmēta* scans ∪ -- ∪ (six *mātrās*), and *viśśāmēta* as --- ∪ (seven *mātrās*). Other examples of this conjunct are *viśsamu* (*viśramam*), VIII, 2; *viśsama* (id.), V, 5; VIII, 3.

126. *-sr-* > *-sr-* in *miśra-* (*miśra-*), VII, 4. If this is not a scribal error, I am unable to account for the presence of *sr*. The word is certainly equivalent to *miśra-* in the technical sense of a long vowel, and is so explained in the Comm. Being in association with *mritaka-* (*mṛtaka-*), a short vowel, and with *sūtaka-*, a *ṣluta* vowel, it is certainly intended as a Ts. or sTs.

127. *-śv-* > *-ś-* in *cakkēśara* (*cakrēśvarī*), XIII, 5; *ṣaramēśara* (*ṣaramēśvarī*), V, 4; *raudrēśara* (*raudrēśvarī*), V, 4; *vāmēśara* (*vāmēśvarī*) V, 3.

128. *-rś-*, see under *r*-conjuncts (§ 103).

129. *-ṣṭh-* > *-ṣṭh-* in *siṣṭha* (*ṣṣṭhī*), III, 5. This word is evidently a nonce back-formation from *siṭha*, made up in order to rhyme with *niṣṭha* in the same verse.

130. *-ṣṭh-* > *-ṭh-* in *jēṭhī* (*jyēṣṭhā*), II, 4; *bārōṭhē* (*dvāra*(*pra*)*kōṣṭhēna*, see § 120), VI, 3.

131. *-ṣṭ-* > *-ṣṭ-* in *caṣṭhā* (*catusṣṭhā*), VI, 3.

132. *-ṣm-* > *-ṣh-* in *ṣaha* (? *uṣmā*, cf. Pr. *bhiṣṭhō* < *bhiṣmah*), II, 7.

133. *-śy-* > *-ś-* in *śiśu-* (*śiśya-*), IX, 6. The final *u* is probably due to confusion with the Skr. *śiśu-*.

134. *-rṣ-*, see under *r*-conjuncts (§ 103).

135. *sk-* > *kh-* in *khambhēta* (*skambhitvā*), VIII, 5.

136. *skh-* > *kh-* in *khalita-* (*skhalita-*), XIV, 1.

137. *sth-* > *th-* in *thāna* (*sthānē*), VIII, 2; *thānīsa* (*sthānīnaḥ*, gen. sg.), VII, 8; *thāvu* (see below, § 138) (*sthāpitaḥ*), IX, 3; *thiti-* (*sthiti-*), III, 5; VI, 5; *thīta-* (*sthīta-*), XIII, 2; *thiya* (*sthītā*), V, 1; *thyōha* (*sthīyatē*), XII, 7.

138. *sth-* > *th-* in *thāvu* (see above) (*sthāpitaḥ*, *-tam*), III, 4; XII, 4. Regarding the interchange of *th* and *ṭh* in the root *sthā-*, see Pischel § 309.

¹ The text has *viśāmēta*, but this is almost certainly a scribal blunder. The Comm. translates it by *viśrāmya*.

139. *sp-* > *ph-* (Tbh.) or (as sTs.) takes *svarahhakti*. Thus, *phandu* (*spandah*), V, 3; *phandē* (*spandēna*), III, 5; but (sTs.) *sapandā* (*spandāt*), II, 1; and, also in III, 5, *sapandē* (*spandēna*).

140. *sp-* > *p-*. This occurs in various derivatives of the root *spṛś-* (cf. Pischel, 311). Thus, *paraśu* (*sparsah*), XII, 1; *pariśijī* (? *spṛśyatē*¹), XII, 1; *piśandu* (§*spṛśantah*), IV, 3; *piśi* (*spṛścē*), V, 4; *piśō* (*spṛśah*), IV, 3.

141. *sph-* > *ph-* in *phuri* (*sphurati*), I, 5.

142. *sm-* > *m-* in *mārāvē* (*smāritāh*), XIV, 1.

143. *-sy-* > *-s-* in *sarahasa-* (*sarahasya-*), XIII, 6, and in genitives singular, such as *ānandasa* (*ānandasya*), VI, 4, 5; VIII, 6, and many others given in § 178.

144. *sv-* > *s-* in *sabhāva* (*svabhāvā*), III, 5; *sabhāvu* (*svabhāvah*), XI, 1; *sara-* (*svara-*), VII, 4; *sarūpa* (*svarūpā*), III, 2, but *surūpa* (*svarūpam*), V, 6; *sēdu* (*svēdah*), II, 5. So:—

-sv- > *-ss-* in *assara-* (*asvara-*), VII, 7; *assarū* (*asvarah*), VII, 5; VIII, 5.

145. *kṣ* is generally preserved unchanged, as in *pēkṣēta* (*prēkṣya*), IV, 6; *bhākṣēta* (*bhākṣayitvā*), I, 3; *kṣavēta*² (*kṣapayitvā*), III, 6; *kṣavu* (*kṣapitah*), XII, 5; *kṣavanō* (*kṣapānam*), XII, 2.

h-conjuncts.

146. *-hm-* > *-mm-* in *bammu* (*brahmā*), IX, 6.

hr- > *h-* in *hadē* (*hradē*), X, 7.

Sandhi.

147. There is a curious instance of *Sandhi* in *hadannāsa* (II, 7), which represents a Skr. *hṛd* + *nāsāh* (nom. pl.). It looks like a mistake for *hannāsa* (*hṛnnāsāh*), and this is to a certain extent borne out by the metre, the line having 17 *mātrās* instead of the usual 15.

148. To sum up the treatment of consonants:—as in Prakrit and Apabhraṁśa, all words must end in a vowel. Hence, original final consonants are usually elided. In some cases, however, the vowel *a* is added as a termination, and the original final consonant is then treated as intervocalic. See § 55.

149. We see signs of the Dardic hesitation between Cerebrals and Dentals (cf. Paisāci in Hc. iv, 311). Thus, we have *d* > *ḍ* (§ 45), and the Prakrit *paḍi* (*prati*) represented by *paḍi* (§ 43). In Tbh., *n* regularly becomes *ṇ* (§ 41), as in Paisāci and Mod. Ksh., and we find this also even in sTs. This last fact is noteworthy when compared with the state of affairs in western Indo-Aryan languages, in which original *-n-* > Tbh. *-ṇ-*.

150. Other points of agreement with Paisāci are the retention of intervocalic single consonants (§§ 43, 55, and also below, § 153), and the change of *jñ* and *ny* to *ñ* (§§ 74, 85).

151. As regards conjunct consonants, the Prakrit-Apabhraṁśa rule, that when one member of a conjunct is elided the surviving member is doubled, is here not consistently followed. Speaking broadly, the Prakrit rule is that the doubled conso-

¹ See the remarks on *pariśēta* and *pariśijī* in §§ 254, 258.

² I read *sarūpu kṣavēta* for *sartha pūkṣavēta*.

nant must be preceded by a short vowel. Thus, such words as *bhakta-* and *bhākta-* would both become *bhatta-* in Prakrit. In a further stage of development, the double consonant may be simplified, and the preceding vowel, whether short or long by origin, is then lengthened in compensation. Thus, *bhatta-*, at this further stage, becomes *bhāta-*, whether it represents an original *bhakta-* or an original *bhākta-*.

152. In the MNP. these rules are not regularly observed. It is true that, when the preceding vowel is originally short, doubled consonants are frequent¹. On the other hand, there are only three examples of an original long vowel being shortened before a double consonant². There is only one instance of the Prakrit simplification of the double letter lengthening the preceding vowel in compensation. It is *svānu-* (*svapna-*), which, as stated in §75, I believe to be a false reading.

153. Very often, however, the Prakrit rule as to doubling is abandoned, and (here, again, we are reminded of Paiśāci) the surviving consonant of the conjunct is not doubled, but stands by itself, single and unsupported. If the vowel preceding the original conjunct was originally short, it remains short, and if it was originally long, it remains long³. It even happens that, in the case of three words, both systems are used. These are *majja-* or *maja-* (*madhya-*) (§84), *añña-* or *aña-* (*anya-*) (§85), and *viśāmēta* or *viśāmēta* (*viśrāmya*) (§125). In one other word, the original long vowel before the new single consonant is at one time shortened (m.c.), and at another time left long. It is *kamatha-* or *kamāthu-* (*kramārtha-*) (§94). Finally, in one instance, an original long vowel before the new single consonant is not preserved, but is (m.c.) shortened. The word is *akamēya* (*ākramayati*) (§105).

154. This completes the account of the treatment of original conjunct consonants in the MNP., and I think that there can be little doubt that the variations noted were due to the exigencies of metre, and that in the ordinary colloquial speech of the time there was great fluctuation in the pronunciation of words that originally contained a conjunct consonant. In other words, that the writer of the MNP. said *ṭatta-*, *ṭata-*, or *ṭātu-* for *prāṭta-*, and *vatta-*, *vata-* or *vātu-* for *avāṭta-*, at will, as the rhythm of the sentence required. In modern Dardic, the custom is to have the single consonant, and to preserve the preceding vowel, long or short, as in the original. Thus, in Mod. Ksh. we have (out of hundreds of examples) *bata-* (*bhaktaka-*), *mat-* (*matta-*), *ṭam-* (*ṭadma-*), and *vātu-* (*avāṭtaka-*). Apparently, in the MNP., the author, who was a profound Sanskrit scholar, used, as occasion required, at one time the Indian Prakrit forms, and at other times the Dardic forms, both of which were intelligible to his

¹ The examples, with the numbers of the paragraphs in which they occur are:—*ukhiṣṭa*, 58; *upṭatta*, 59; *ugghātu*, 63; *ubbhāvē*, 64; *kiṭta*, 65; *satta*, 65; *lagga-*, 73; *ṭamma-*, 77; *jammu*, 79; *ṭaccī*, 82; *viccī*, 82; *sūṭajji*, 83; *riṭṭi*, 84; *vagga-*, 89; *sagga-*, 89; *accu*, 89; *niṅghātu*, 89; *accana-*, 90; *vajjēta*, 91; *vanna-*, 92; *kattihu*, 93; *niddhāmi*, 95; *taṭṭōha*, 97; *nīlakṣi*, 100; *caṇvēna*, 101; *niṅvāna-*, 101; *saṅva-*, 101; *cakka-*, 105; *cijjalana-*, 117; *ṭavvīha-*, 118; *diṣṭi*, 124; *ṭaṣṭu*, 124; *viśāmēta*, 124; *caṭṭōha*, 131; *assara-*, 144; *ṭammu*, 146.

² *ṭatta* (*prāṭṭiṭh*), 65; *vatta* (*vyāṭṭiṭh*), 65; *matta* (**mātrā*), 108.

³ Examples with an original short vowel are:—*iṭha*, §69; *vyugata*, 61; *jaṭi*, 85; *valu*, 93; *akama*, 105; *muda*, 109; *apabōdha-*, 110; *ṭavanyu*, 118; *viśāmēta*, 125; *ṣiṣu*, 133; *sarahasa*, 143; and all genitives singular like *ānandasa*, 143.

Examples with an original long vowel are:—*vātu*, 66; *āpa-*, 76; *dhāmi*, 79; *mūci*, 82; *āji*, 83; *sāmāni*, 85; *bhāvi*, 88; *māgē*, 89; *ṭigha-*, 89; *ṭūna-*, 93; *kiṭāthu*, 94; *kamāthu* (also *kamathu*), 94; *ṭadāthu*, etc. 94; *ūma*, 98; *ṭūji*, 99; *āśāni*, 124; *āśraya*, 125; *vāmēśara*, etc. 127; *jēṭhi*, 130.

compatriots. The Dardic forms are those now used in Sindhī, and it will be observed that the author very rarely used the most developed Prakrit form involving a new single consonant preceded by a lengthened vowel which was originally short. It is to be noted that at the present day, Panjābī, in contrast to such languages as Gujarāṭī and Hindī, adheres to the less developed Prakrit system of employing the double consonant, and never simplifying it. It would be with the Prakrit of the Panjāb that Śitikaṇṭha would naturally have been best acquainted.

DECLENSION OF NOUNS.

155. **Singular, Nominative.** *Masculine and Neuter.* There is no distinction between the two genders. Most nouns are treated as *a*-bases, the declension corresponding to the first declension of Mod. Ksh. The usual termination of the Nominative Singular is, as in Apabhraṃśa, *u*. Thus (original masculines)—*akāru* (*akārah*), II, 4, 6a; *akamu* (*akamah*), X, 3; *anantaru* (*anantarah*), II, 4; *anikētu* (*-tah*), I, 5; *anubhāvu* (*-vah*), X, 8; *apabōdhu* (*aprabōdhal*), II, 3; *arthu* (*-thah*), II, 2; *avakāsu* (*-sah*), XIII, 5; *avikāru* (*-rah*), V, 4; *assaru* (*asvarah*), VII, 5; VIII, 5; *ākasmiku* (*-kah*), X, 3; *ākāru* (*-rah*), V, 4; *ādhāru* (*-rah*), VII, 5; *ādēsu* (*-sah*), VII, 8; *ukāru* (*-rah*), II, 6a; *uccāru* (*-rah*), VII, 5; *udayu* (*-yah*), VII, 3, 4; VIII, 4; IX, 6; *uditu* (*-tah*), II, 1; *ugghātu* (*udghātali*), II, 1; *upahāru* (*-rah*), VII, 5; *kattiku* (*karṭṭkah*), II, 2; *kapu* (*kaphah*), II, 7; *kamu* (*kramah*), IV, 7; VI, 3; *kalāpu* (*-pah*), IV, 5; VII, 3; *kṣavu* (*kṣapital*), XII, 5; *catuskālū* (*-lah*), II, 4; *cālaku* (*-kah*), IV, 4; *-ju* (*-jah*), II, 7; *thāvu* (*sthāpitah*), III, 4; *tulaggu* (*tallagnah*), II, 2; *thāvu* (*sthāpitah*), IX, 3; *divyōgu* (*divyaughah*), VI, 5; *dausaru* (*dvisarah*), II, 8; *dyu* (*dēvah*), IV, 2; *nigghātu* (*nirghātah*), II, 1; *nibhāvu* (*-vah*), XII, 4; *pakāsu* (*prakāśah*), VI, 5; XIII, 5; *pañcavāhu* (*-hah*), V, 6; *padāthu* (*padārthah*), VI, 1; XII, 2; *papañcu* (*prapañcah*), XI, 2; *paramāthu* (*-ārthah*), IV, 7; XII, 2; *paribhāvu* (*-vah*), IX, 4; *palu* (*-lah*), II, 7; *pasaru* (*prasarah*), II, 4, 6a; *pālaku* (*-kah*), IV, 4; *pāvaku* (*-kah*), II, 5; *pranu* (? *pranah*, ancient, but cf. Mod. Ksh. *pron*^v, clear, manifest), IV, 7; *phandū* (*spandah*), V, 3; *bōdhu* (*-dhal*), II, 3; *bhāvu* (*-vah*), XI, 4; *bhōgu* (*-gah*), XII, 4; *mahadyu* (*mahādēval*), IX, 6; *mahāthu* (*mahārthah*), I, 5; VI, 7; XII, 7; *mēlāpu* (*-pah*), IV, 1; VII, 3, 9; *yāgu* (*-gah*), IV, 1; *rasu* (*-sah*), II, 7; *rāu*, IX, 3 or *rāvu*, VII, 4 (*rāvah*); *-rūpu* (*-rūpah*), VII, 5; *vilāpu* (*-pah*), VII, 9; *vyānu* (*-nah*), VIII, 4; *samhāru* (*-rah*), III, 6; *saggu* (*sargah*), II, 2; *saditu* (? *sadātana*), XII, 7; *sabhāvu* (*svabhāvah*), XI, 1; *samu* (*-mah*), IV, 3; *samayu* (*-yah*), XIII, 2; *samudāyu* (*-yah*), III, 9; *sāru*, (*-rah*), VII, 1; *sēdu* (*svēdah*), II, 5. It will be observed that a great many of these words are Tss., to which the Prakrit termination has been added. This applies also to the other declensional forms to be noted below, and the fact will not be referred to again.

156. The following neuter nouns in *ah* have been treated as *a*-bases:—*lēju* (*-jah*), II, 6a; *nabhu* (*-bhal*), II, 5, 6a; *manu* (*manah*), VII, 5; *raju* (*-jah*), II, 7; *sīru* (*-rah*), IX, 5. So, with *an*-bases:—*jammu* (*janma*), XIV, 1; *vatu* (Mod. Ksh. *wat*-, fem.) (*vartma*), IX, 7.

157. Other words which have been treated as *a*-bases are *bammu* (*brahmā*), IX, 6; *vasu* (masc.) (*vasā*, fem.), II, 7; *bindu* (*-duh*), VII, 6; VIII, 3; *bhānu* (*-nuh*), IX, 6; *vivakṣu* (*-ṣuh*), IV, 4; *ciṣu* (*tviṣ*-, *tviṭ*), VI, 3.

158. As examples of neuter *a*-bases, we have:—*ālīnganu* (*-nam*), XII, 4; *oddiyānu* (*udḍiyānam*), IV, 1; *karanu* (*-nam*), XII, 4; *-kālu* (*-kālam*), XIII, 1; *kitāthu* (*kṣṭārtham*), XIV, 1; *cakku* (*cakram*), VI, 4; *nānu* (*jñānam*, cf. *nāna*, § 161), II, 4; VII, 4; *thāvu* (*sthāpitam*), XII, 4; *nīdu* (? *nītyam*), XII, 5; *niṣkālū* (*-lam*), II, 4; *paru* (*-ram*), I, 3; II, 6; *pañcaku* (*-kam*), V, 6; *patitu* (*-tam*), X, 1; *pīthu* (*-ṭham*), IV, 1, 2, 7; *pūjanu*

(-nam), X, 1; *bhūṣanu* (-nam), VII, 6; *vāciku* (-kam), II, 3; *sarīru* (-ram), IV, 4; *sāmarasyu* (-yam), VII, 9; *sūcanu* (-nam), X, 1.

159. In a few words we have the Prakrit termination *ō* instead of the Apabhraṁśa *u*. This is found even with words originally neuter. Many occur at the end of a line, and generally it seems that *u* has been lengthened to *ō metri causa*. The examples are (Masc.) *anubhāvō* (-vaḥ), XIII, 6; *udiyō* (*uditah*), II, 5; *ubbhāvō* (*udbhāv(it)ah*), XIII, 6; *kātō* (-laḥ), X, 8; *gatō* (-taḥ), IV, 5; *-ghanō* (-ghanah), XIII, 6; *pañcagunō* (-nah), II, 8; *phākō* (-kah), II, 7; *piśō* (*spṛśah*), IV, 3; *prathamō* (-mah), V, 3; *mahāvīrō* (-rah), IV, 7; *mudīto* (-taḥ) (in this word the final *o* scans as short), XII, 5; *savvagatō* (*sarvagataḥ*), IV, 7; *sārasano* (= *sārabhūtaḥ*), II, 8. (Neut.) *lanakaranō* (*alamkaranam*), IV, 2; *kṣavano* (*kṣapaṇam*), XII, 2; *vātō* (*avāptam*), XIII, 1.

160. As in Apabhraṁśa, the termination *u* is often dropped (cf. Hc. iv, 344), and the bare base is employed for the nominative. Examples are:—*avayava* (-yah), II, 6a; *ōgha* (*ōghah*), XIII, 12; *kōdha* (*krōdhaḥ*), II, 7; *gāsaka* (*grāsakah*), IV, 3; *cimmaya* (*cimmayah*), XII, 1; *pariḥōṣa* (-ṣah), VIII, 1; *bhāva* (-vah), IV, 3; *bhāsa* (*bhāsah*), II, 7; *rahiya* (*rahitah*), V, 3; *vanna* (*varnah*), X, 6; *vikāsaka* (-kah), IX, 6; *viśaya* (-yah), XII, 1; *hatha* (-thah), II, 7. So *mēḍa* (-dah), II, 7; *phaha* (*uṣmā*, Mod. Ksh. *phāh*), II, 7; *vasta* (*vastu*), III, 3; *tvaca* (*tvac-*, *tvak*), II, 7.

161. Original neuter *a*-bases are:—*anurūpa* (-pam), III, 2; V, 6; *avatārana* (-nam), IX, 5; *avivāda* (-dam), XIII, 1; *kampana* (-nam), III, 2; *kṣētra* (-am), IV, 4; *gata* (-am), XIV, 1; *nāna* (also *nānu*, ab., § 158) (*jñānam*), V, 2; *nirantara* (-am), IX, 7; *maṅgala* (-am), III, 8; *mukha* (-am), XIII, 1; *mauna* (-am), III, 9; *rūpa* (-am), IV, 2; X, 5; *lādana* (-am), XII, 2; *vitta* (*vyttam*, for *vratam*), XII, 2; *vidhāna* (-am), III, 4; *salila* (-am), II, 5; *surūpa* (*svarūpam*), V, 6.

162. *Feminine*. The Nominative singular feminine generally ends in *a*,—this even with *i*-bases. Examples are:—

a-bases:—*aka* (*ēkā*), V, 1; *aṅkuriya* (-ritā), III, 5; *antara* (-rā), X, 7; *amba* (-ā), II, 4; *avikāra* (-rā), IX, 7; *ganana* (*gaṇanā*) VII, 6; *gata* (-tā), I, 4; *cukhaṅḍa* (*catuṣkhaṅḍā*), X, 7; *-thiya* (-sthitā), V, 1; *datta* (-ā), III, 2; *-pada* (-padā), V, 5; *daśa* (-ā), X, 7; *dēvata* (-tā), V, 1, 5; *nākhyā* (*anākhyā*), XI, 1 (cf. *nākhyi*, bel., § 164); *niṣṭha* (-ā), III, 5; *-bhāsa* (-ā), XI, 1; *parampara* (-ā), IX, 7; *parasiddha* (*prasiddhā*), VIII, 2a; *bhūmika* (-ā), III, 3; *maṅgala* (-ā), IX, 1; *maryāda* (-ā), XIII, 1; *lagga* (*lagṇā*), II, 5; *valita* (-ā), XI, 4; *vāma* (-ā), II, 4; *vikasiya* (-sitā), V, 3; *vyugata* (*vyudgatā*), XII, 7; *ṣaḍvidha* (-ā), X, 6; *sabhāva* (*svabhāvā*), III, 5; *samarasa* (-ā), III, 2; *samidha* (*samyd-dhā*), VIII, 2a; *savvaga* (*sarvagā*), V, 2. The termination *-ikā* becomes *-aka*, as in *gāsaka* (*grāsikā*), VIII, 6; *nāyaka* (*nāyikā*), VII, 1; IX, 2; *pūraka* (*pūrikā*), XI, 6; *vidhāyaka* (*vidhāyikā*), XI, 6; *vilāpaka* (*-ikā*), VIII, 6. The word *dīpamālā*, being a pure Ts., is an apparent exception.

163. For feminine words which have not *a*-bases we have:—*unmana* (*unmanah*), III, 6; *āhuta* (-tiḥ), XI, 6; *upḥatta* (*utpattiḥ*), VI, 4; *ūma* (*ūrmih*), II, 5; *kuḷārana* (-niḥ), IX, 5; *niṣṭatta* (-ttiḥ), II, 8; *parasūta* (*prasūtiḥ*), VII, 8; *ḥatta* (*phrāptiḥ*), X, 1; *bōdhārana* (-niḥ), I, 4; *bhūma* (-miḥ), II, 5; *vitatta* (? *vitatiḥ*), II, 8; *vatta* (*vyāptiḥ*), VI, 4; *sattu* (cf. *satti*, bel., § 164) (*ṣaktiḥ*), X, 6; XI, 1; *siṣṭha* (*syṣṭiḥ*, *ṣṭ* having become *ṣṭh*)

for the sake of rhyme), III, 5; *idyśa* (-*śi*) II, 8; *khēcara* (-*ri*), V, 3; *cakkēsara* (*cakrēsvarī*), XIII, 5; *caṇḍa* (-*i*), X, 7; *dēva* (-*i*), X, 7; *nada* (-*di*), III, 7; *paramēsara* (*paramēsvarī*), V, 4; *parāmukha* (*parānmukhī*), III, 6; *bhūcara* (-*ri*), V, 3; *raudra* (-*dri*), II, 4; *raudrēsara* (*raudrēsvarī*), V, 4; *vāmēsara* (*vāmēsvarī*), V, 3; *vidhārana* (*vidāranī*), the change of *d* to *dh* being merely graphic, to serve a rhyme), I, 4; *sākina* (-*nī*), VIII, 2; *sakaršana* (*samkarṣiṇī*), IV, 6¹; *sattadaśākṣara* (*saptadaśākṣarī*), X, 7; *amayēśvara* (*samayēsvarī*) XI, 6.

164. In a few cases (cf. also § 245) an original final *i* has been preserved. Thus, *utti* (*uktih*), XII, 7; *satti* (cf. *satta*, ab., § 163) (*saktih*), III, 5.

Irregular are:—*ahali* (*ahalikā*), I, 4; *āsāñi* (*āśyānikā*), II, 5, cf. § 13; *kiśi* (*kyśikā*), I, 3; *samāñi* (*samānikā*), III, 2; *sāmāñi* (*sāmānyikā*) XI, 5. The word *anākhyēya* > *nākhyi* (XIII, 2), and is unchanged in the fem. sing. nom. *nākhyi* (*anākhyēyā*), III, 6.

165. **Singular, Accusative.** This is the same in form as the Nominative. Examples are:—(*a*-bases, m. and n.) *akamu* (*akramam*), XI, 2; *antu* (-*am*), VII, 5; *aggu* (*argham*), XIII, 3; *avalāru* (-*am*), X, 4; *ācāru* (-*am*), VII, 1; *udayu* (-*am*), V, 5; VIII, 2; *upacāru* (-*am*), IV, 6; *upahāru* (-*am*), IV, 6; *kamalaḥu* (-*am*), XI, 7; *kamu* (*kramam*), XI, 2; XII, 5; XIV, 1; *ghasmaru* (-*am*), I, 3; *ñēyu* (*jñēyam*), III, 8; *nirūḥu* (-*am*), X, 5; *pakāru* (*prakāvam*), VII, 2; *ḥammanābhū* (*ḥadmanābham*), XI, 7; *paramāthū* (*paramārtham*), XIV, 1; *paraśu* (*sparsam*), XII, 1; *parihāru* (-*am*), III, 6; *praśamu* (-*am*), XI, 5; *bhāvu* (-*am*), XII, 5; *bhairu* (*bhairavam*), I, 3; *mōlāḥu* (-*am*), IV, 5; *vinḍu* (*vrṇḍam*), VII, 1; *viśayu* (-*am*), V, 3; *sarīru* (-*am*), IV, 3; *saggu* (*sārgham*), XIII, 3; *saṁcāru* (-*am*), VII, 2; *sarūḥu*² (*svarūḥam*), III, 6. Similarly, with non-*a*-bases, *caru* (*carum*), V, 5; *bhūmu* (*bhūmim*, a feminine word treated as masculine), IX, 4; *vāḥu* (*vāḥuk*), VIII, 2.

166. Accusatives in *-ō* are:—*padipātō* (*pratipātam*), XIII, 1; *ḥiḥapanō* (*ḥiḥatvam*), IV, 2; *valitō* (-*am*), VII, 2; *samarasō* (? *samarasam*), X, 4.

167. Accusatives in *-a* are:—*āḥa* (*ātmānam*), IV, 6; *āsaya* (*āśrayam*), I, 3; *canda* (*caudram*), VIII, 4; *bhājana* (-*am*), VIII, 1; *lādana* (-*am*), XII, 5; *vayana* (*vacanam*), XII, 5; *viśsama* (*viśramam*), V, 5; VIII, 3.

168. Feminine Accusatives are:—*gālaka* (*gālikām*), VII, 1; *maṅgala* (-*ām*), VII, 1; IX, 5; *mamala* (-*ām*), IV, 6. From an *i*-base, we have *matā* (*matim*), II, 6.

169. **Singular, Instrumental.** In a few instances, the Instrumental Singular of *a*-bases (masc. and neut.) ends, as in Sanskrit, in *ēna*. It happens that the third person plural of the present of causative verbs also ends in *ēna* (§§ 236, 263), and it is not always easy to distinguish between the two cases. The following are, I think, pretty certain instances of the Instrumental:—*akkēna* (*ekēna*), V, 4; *kamēna* (*kramēna*), IX, 2; *ubbhāvēna* (*udbhāvēna* or ? *udbhāvayanti*), X, 3; *vāyēna* (? *vādēna*, ? *vādayanti*), V, 2.

170. The more general termination of this case for *a*-bases, masc. and neut., is *ēṅ*.

¹ Text *sakaršana pēkṣāta*. If we read *samkaršana pēkṣāta*, it would improve the metre.

² Reading *sarūḥu kṣavēta* for *sartha ḥukṣavēta*.

³ It is worth noting that in Tākī Prakrit, which was spoken in the northern Panjāb, just south of Kashmir, the Instr. Sing. optionally ended in *ē* (Mk. xvi, 4).

This is also employed for the locative, and the identification of the particular case intended is sometimes doubtful. The following are probably Instrumentals:—*akalēśē* (*aklēśēna*), IV, 5; *anubhāvē* (*-ēna*), III, 4; V, 2; VI, 1; *abhāvē* (*-ēna*), VII, 5; *avatārē* (*-ēna*), III, 9; *astrē* (*-ēna*), XI, 7; *ācārē* (*-ēna*), X, 6; *ādēśē* (*-ēna*), IV, 5; *āvēśē* (*-ēna*), XII, 3; *upayōgē* (*-ēna*), XIII, 4; *ullasanē* (*-ēna*), IV, 1; *ōghē* (*-ēna*), V, 5; XIII, 2, 4; *kamē* (*kramēna*), VII, 3; IX, 1; *galanē* (*-ēna*), IV, 3; *gunē* (*gunēna*), IX, 1, 2; *ghanē* (*-ēna*), VI, 5; *cārē* (*-ēna*), VI, 5; *jalanē* (*jvalanēna*), IV, 3; *dēvandē* (*dēvēndrēna*), VI, 3; *nāthē* (*-ēna*), III, 9; *nidhānē* (*-ēna*), X, 3; *nyāsē* (*-ēna*), XIII, 3; *pariyāsē* (*-ēna*), XIII, 3; *pakārē* (*prakārēna*), IX, 3; *patibhōgē* (*pratibhōgēna*), XIII, 2; *ṣamānē* (*ṣramānēna*), VIII, 3; *parāmarīśē* (*parāmarsēna*), III, 5; *parikalanē* (*-ēna*), IV, 1; *ṣavēśē* (*ṣravēśēna*), XII, 3; *ṣasādē* (*ṣrasādēna*), XIV, 1; *ṣānē* (*ṣrānēna*), II, 2; VIII, 3; *ṣhandē* (cf. *ṣapandē*, bel.) (*ṣpandēna*), III, 5; *bārōḥē* (*dvārakoṣṭhēna*), VI, 3; *bhāvē* (*-ēna*), VII, 8; *mayē* (*-mayēna*), II, 2; *māgē* (*mārgēna*), VIII, 4; *mēlē* (*-ēna*), II, 6; VII, 4; *rāvē* (*-ēna*), VII, 4; *vikāsē* (*-ēna*), VIII, 3; *vidhānē* (*-ēna*), X, 3; *vibhāgē* (*-ēna*), XI, 6; XII, 1; *saḥjē* (? *saḥjanēna*), X, 2; *samdhānē* (*-ēna*), II, 2; *ṣapandē* (cf. *ṣhandē*, ab.) (*ṣpandēna*), III, 5; *sabbhāvē* (*sadbhāvēna*), V, 1; VI, 1; *samādhānē* (*-ēna*), XII, 3, 6; *samṣrasarē* (*-ēna*), VII, 8; *sahitē* (*-ēna*), IX, 4; *hamkārē* (*ahamkārēna*), VI, 5.

171. In *-jañī* (? *-janyēna*) (V, 4; X, 5; XIII, 3) the Instrumental apparently ends in *ī*, in which connexion it may be pointed out that in Mod. Ksh. *ē* and *ī* are liable to confusion. See also § 270. In *āviśṭō* (III, 9) for *āviśṭēna*, the termination has perhaps been altered for the sake of rhyme, see also § 188 (Locative Singular). In X, 1 there are two words in the form of the Sanskrit dative, which are used in the sense of the Instrumental. These are *ṣāyāya* (*uṣāyēna*) and *rānāya*, a word of uncertain derivation, which the Comm. translates by *rājaṣarīkārāḍḍhanēna*.

172. There is perhaps one example of an Instrumental of a masculine *u*-base in *camē* (*camvā*), VII, 3.

173. In the case of feminine *ā*-bases, the Instrumental Singular ends in *ī*, in:—*kali* (*kalayā*), XI, 2; *ḥampi* (*ḥampayā*), VI, 2; *ḥanti* (*ahanlayā*), I, 5. In the case of *i*-bases, it ends in *ī*, in:—*diṣṭī* (*dṛṣṭyā*), V, 5; *ṣativiccī* (*ṣrativrṭtyā*), VII, 9; *ṣaripāṭī* (*-tyā*), VII, 2; *ṣaviṣṭī* (? **ṣraviṣṭyā*, for *ṣravēśēna*), V, 5; *yaccī* (? *ṣatyā*), X, 4; *rañḥī* (? *randhyā*, comm. *vyāṣṭyā*), VII, 7; *ruccī* (**rutyā*), II, 1; *viccī* (*vrṭtyā*), X, 2; *viccī* (probably to be corrected to *biccī*) (*bhṭtyā*), X, 2.

174. In two cases of the feminine of nouns of agency, the Instrumental ends in a short *i*, viz. in *uyavāṇī* and *samavāṇī*, both in XI, 2. See § 245, below.

175. **Singular, Dative.** The synthetic form of the Dative Singular has not been noted, unless we put under this head the *ṣāyāya* and *rānāya* noted in § 171, ab., as Instrumentals.

176. **Singular, Ablative.** In the case of *a*-bases, the Ablative Singular ends in *ā*, the old Prakrit form in *āu* surviving only in one case noted in § 177, bel. Examples of this Ablative in *ā* are:—*anulā* (*-āt*), XI, 4; *aṣrasarā* (*-āt*), VIII, 2a; *avasānā* (*-āt*), III, 3; *ūdavaḥā* (*ūrdhvaḥāhāt*), VIII, 2a; *ṛdayā* (*ḥṛdayāt*), XII, 2; *kandā* (*-āt*), VIII, 2a; *-kalā* (*-kalāt*), XI, 4; *kuharā* (*-āt*), II, 5; *candā* (*candrāt*), VI, 4; VIII, 3; *nigharīśā* (*nigharṣāt* or *nirghā*), II, 5; *ṣammā* (*ṣadmāt*), VIII, 2a; *ṣīḥā* (*-āt*), VIII, 2; *bhāsā*

(-āt), XI, 3; *majjā* (*madhyāt*), II, 8; III, 3; *mūlā* (-āt), IX, 1; *yugmā* (-āt), II, 1; *śivā* (-āt), V, 3; *saṅgandā* (*spandāt*), II, 1; *samayā* (? *samayāt*), XIII, 4; *-sarā* (-*sarāt*), VIII, 2a.

177. Similarly, with other bases:—*āpā* (*adbhyaḥ*, base *āp-*, § 86), II, 6 (cf. *āpā* > *ātmanaḥ*, under the genitive, § 180); *nabhā* (*nabhasaḥ*), XI, 2.

In one case (XII, 2) we have the Prakrit Ablative *ṛdayāu* (*hṛdayāt*).

With *i*-bases we have:—*kōḷi* (the *kōṭa* of the printed text is incorrect) (*kōṭyāḥ*), III, 3; and *nābhī* (*nābhyāḥ*), XI, 7.

178. **Singular, Genitive.** The synthetic Genitive singular of *a*-bases ends in *-sa* as in:—*ānandasa* (*ānandasya*), VI, 4, 5; VIII, 6; *udayasa* (*udayisa* of P. is incorrect) (-*sya*), III, 2; *ñānasa* (*jñānasya*), III, 3; *nādasā* (-*sya*), II, 1, 2; *paṭṭasa* (= *paścasya*, see § 122), XII, 4; *paṭṭekasa* (*pratyekasya*), X, 7; *bōdhasa* (-*sya*), VIII, 6; *bhāvasa* (-*sya*), III, 6; XII, 4; *vibhāgasa* (-*sya*), I, 5; *śitikanṭhasa* (-*sya*), XIV, 1; *śivasa* (-*sya*), II, 1; *samudrasa* (-*sya*), V, 1.

179. Other Genitives ending in *-sa* are:—*sthānisa* (*sthāninaḥ*), VII, 8; *sandasa* (? *saṁdhāḥ*), XII, 7; *jantusa* (*jantōḥ*), III, 2; *paḥḥusa* (*prabhōḥ*), XIV, 1; *rāyasa* (*rājñāḥ*), X, 1.

180. The Genitive of the Sanskrit *ātman-* is the same in form as the Ablative. We need not, therefore, be surprised to find in VIII, 6, *āpā* (an Ablative Singular form) used as a Genitive, and equivalent to *ātmanaḥ*. We have already seen (§ 177) that *āpā* (*adbhyaḥ*), is also the Ablative Singular of an altogether different word. The word *ravi* (*ravēḥ*), VII, 4, if I have correctly interpreted it, seems to be treated as a Genitive Feminine.

181. Feminine *ā*-bases take *-i* in the Genitive Singular, as in *gaṅgi* (*gaṅgāyāḥ*). An exception is *sāttā* (*sāktāyāḥ*), VIII, 1. With an enclitic, we have *paṛasyau* (*paṛasyāḥ api*), II, 1. Feminine *i*-bases take *-ī*, as in:—*dēvi* (*dēvyāḥ*), VIII, 1; *māvāsī* (*amāvāsyāḥ*), VIII, 3; *saccī* (*śaktyāḥ*), II, 1; IV, 1; VII, 3, 9; VIII, 6. In the last two, *saccī* is a copyist's mistake, very common in Ksh. MSS., in which *sca* is frequently indistinguishable from *cca*. For *ravi* (VII, 4), see the preceding section.

182. In Mod. Ksh. an analytic Genitive is formed by adding certain postpositions to the noun, such as *ku* (f. *cu*), or *nu* (f. *ñu*). The Genitive so formed is treated as an adjective, agreeing with the governing noun in gender, number, and case. There are traces of this in MNP. For the *ku*-suffix, *paramāthuka* (? *paramārthasya*) (III, 9) is doubtful, as I am not certain about the division of the words. Assuming that it is *paramāthuka mauna* (*paramārthasya maunam*), the word is an example. Quite certain, however, is *ñānuci viccī* (? *biccī*) (*jñānasya bhūṭyā*), X, 2, in which *ñānaci* (Mod. Ksh. *gyānaci*) is a feminine singular instrumental of **ñānuka* (Mod. Ksh. *gyānuk*) agreeing in gender, number, and case with *viccī*. The meaning of the form *śamicī* (XI, 1) is not clear to me. It may possibly be a similar genitive. For the *nu*-suffix we have *paṇanāñi*, a fem. sing. nom. of the genitive masculine **paṇanānu*, agreeing with *ūma* (*paṇanasya ūrmih*), the wave (born of) a hurricane (i.e. of Prabhañjana), II, 5. It will be noted that *ñi* is added to the ablative form *paṇanā*, which is exactly what happens in the modern dialect. In X, 2, we have *saṅkamanyi viccī* (*saṅkramasya vṛṭtyā*), where,

as in the case of *nānaci*, we have a fem. sing. instr. agreeing with *viccī*. Here we have *nyi* instead of *ñi*, which is probably a scribe's blunder common in Ksh. MSS. Here the suffix is added to the bare noun, and not to the ablative. The rule was evidently not fixed in Śitikanṭha's time. Metre, too, may have exercised its influence.

183. **Singular. Locative.** For *a*-bases, in a few instances the original termination *ē* of the Locative Singular has survived. Probably this was *metri causa*. The examples are *akalāpē* (Ts.), VII, 9; *bhuttē* (*bhuktē*), XII, 2; *vijayē* (Ts.), IV, 5; *viṣayē* (Ts.), IV, 5; *hadē* (*hradē*), X, 7. To these words perhaps may be added *malē* (VIII, 4), a word which I am unable to explain. The termination *ē* is also used in Apabhramṣa (Hc. iv, 334).

184. More often the Apabhramṣa termination *i* (Hc. iv, 334) is used, or else the bare base. Examples of the *i*-termination are:—*ṛdayi* (*hrdayē*), XII, 5; *kandī* (*kandē*), VIII, 3; *khasari* (*-rē*), VIII, 2; *ganthi* (*granthē*), I, 4; VII, 9; *thampi* (? *stambhē*), VI, 2; *dandī* (*-ē*), V, 2; *nadī* (*-ē*), IV, 4; *nillakṣi* (? *nirlakṣyē*), X, 8; *nērāji* (*nirājikē*), I, 3; *pañci* (*pañcakē*), III, 7 (cf. *pañcaka*, bel., § 186); *paryanti* (*-ē*), I, 5; II, 2; *pātakami* (*pātakramē*), VI, 3; *piśi* (*spṛṣē*), V, 4; *ṣṭhi* (*-ē*), IV, 3 (cf. *ṣṭha*, bel., § 186); *bhuvani* (*-ē*), XII, 7; *muṇḍi* (*-ē*), V, 2; XIII, 3; *yāgi* (*-ē*), IV, 6; *randhri* (*-ē*), VII, 6; *sūnyi* (*-ē*), VII, 5; *surandī* (*svarandhrē*), XI, 7.

185. Non-*a*-bases treated in the same way are:—*bindi* (? *bindau*), XI, 8; *siri* (*sirasi*), VII, 6; *āpi* (*ātmani*), III, 8; *cidi* (*citi*), (§ 43), XII, 4; *dhāmi* (*dhāmnī*), III, 6; XI, 1; *niddhāmi* (*nirdhāmnī*), XI, 4; *sati* (Ts.), XII, 2.

186. The bare base occurs in:—*andara* (*antarē*, but an Eranian base), III, 9; *andhakāra* (*-rē*), IX, 7 (*andhā* of P, is a misprint); *uttara* (*-rē*), XII, 6; *ōgha* (*-ē*), IX, 1, 2; *kṣava* (*-nē*), IV, 5; VII, 4; *capṣṭha* (? *catuspathē*), VI, 3; *jāngala* (*-ē*), III, 8; *jala* (*-ē*), III, 8; *thāna* (*sthānē*), VIII, 2; *divasa* (*-ē*), XIII, 5; *pañcaka* (*-ē*), XI, 6; XIII, 5 (cf. *pañci*, ab., § 184); *pada* (*-ē*), XI, 2, 5; XII, 3; *paribhōga* (*-ē*), IX, 1; *ṣṭha* (*-ē*), III, 9 (cf. *ṣṭhi*, ab., § 184); *lōka* (*-ē*), III, 8; *śarīra* and *harīra* (*śarīrē*), both XII, 3.

187. Other nouns with Locatives singular in *a* are *jaga* (*jagati*), X, 7; and *vaṣa* (*vaṣuṣi*), XII, 1. The explanations are obvious.

188. A few *a*-bases form Locatives in *ō*. It is not always easy to distinguish between such locatives and nominatives or instrumentals with the same termination (§§ 159, 171). The following are probably locatives:—*čkaghanō* (*-ē*), XIII, 6; *cupāvō* (*catuspādē*), XIII, 3; *trēpāvō* (*trīpādē*), XIII, 3; *mētō* (*-ē*), XII, 2.

189. Feminine Locatives Singular of *i*-bases end in *ī*, as in *nābhī* (*nābhyām*), VIII, 3; *sañjī* (**saṁdhyam*, fem. for masc.), VII, 2.

190. **Plural.** The Dual number is no longer in use, and is represented by the Plural.

191. **Plural, Nominative.** With *a*-bases, whether original or secondary, and whether masculine or neuter, the Nominative Plural generally ends in *a*, as in (masculine) *ākasmika* (*ākasmikau*), XI, 1; *ghōṣa* (*aghōṣāh*), VIII, 1; *ādhina* (*adhīnāh*), VII, 7; *anugata* (*-āh*), XIII, 4; *ukkiṣṭa* (*utkṛṣṭāh*), XII, 6; *kama* (*kramāh*), XIII, 4, 5; *kamā-kama* (*kramākramau*), XI, 5; *nakha* (*-āh*), II, 7; *nāsa* (*-āh*), II, 7; *niṣṭha* (*-āh*), XII, 6;

niṣṭhita (-āḥ), XIII, 6; *pañcaka* (-āḥ), XIII, 4; *pañcaugha* (-āḥ), XIII, 4; *pāna* (*prānāḥ*), II, 7; *para* (-āḥ), XIII, 4; *palayōdaya* (*pralayōdayau*), XI, 1; *bhāsa* (-āḥ), XI, 1; *-bhōga* (-āḥ), XIII, 4; *mānavaugha* (-āḥ), XIII, 4; *mahajana* (XIV, 1) and *mahājana* (XII, 7) (*mahājanāḥ*); *rada* (-āḥ), II, 7; *rāva* (-āḥ), VII, 6; *vāha* (-āḥ), X, 8; *siddha* (*siddhau*, *siddhāḥ*), VII, 2; X, 5.

192. For neuter bases, we have:—*cakka* (*cakrāṇi*), XI, 3; *mahabhūta* (*mahābhūtāni*), VII, 8; *mukhagata* (pl. m. or n.) (-*tāni* or -*tāḥ*), II, 3.

193. In a few places the Nominative Plural of *a*-bases ends in *ē* (see also § 245). These are *ākalitē* (-āḥ), X, 18; *dinnē* (*dattau*), II, 6; *bhinnē* (*bhinnau*), II, 6; *valitē* (-āḥ), X, 18. Each of these occurs at the end of a line, and may be due to the exigencies of metre. It will be remembered that, in Prakrit, the Accusative Plural of *a*-bases ends in *ē*. In one instance (*sāmbhavasiddhā*, VIII, 6), the Nominative Plural appears to end in *ā*, but I am not certain as to the syntax of the sentence. The Nominative Plural of a masculine present participle ends in *u*, as in *piṣandu* (*spṛsantah*), IV, 3. Here the precedent of the Nominative singular of *a*-bases is followed. As seen in § 155, the Sanskrit termination *aḥ* there also becomes *u*. We shall observe a similar change of *aḥ* to *u* in certain nominative plurals of feminine nouns (§ 195).

194. Feminine *ā*-bases have the Nominative Plural in *ā*, a form which also occurs in Prakrit. Thus:—*sātā* (*saktāḥ*), VIII, 4; *sikkā* (-āḥ), VI, 4.

195. Masculine and feminine bases in *ī* alike form the Nominative Plural in *ī*, as in *ādi* (*ādayah*), VII, 7; X, 4; *ājī* (*ādyāḥ*), III, 4; *kādī* (*kādayah*), VII, 6; *dēvī* (*dēvyah*), VIII, 4; *yājī* (*yādyāḥ*), VIII, 1; *yādi* (*yādayah*), VII, 2; *yōnī* (*yōnayah*), X, 4; *sājī* (*sādyāḥ*), VIII, 1; *saccī* (**saktayah*, for *saktayah*), X, 4. Of these *ājī*, *yājī*, and *sājī* are properly *a*-bases (*ādyā-*, *yādyā-*, *sādyā-*), but have been treated as *i*-bases, through confusion with *ādi-*, *yādi-*, and *sādi-*. The *dy* of *adya* becomes *j* (§ 83), but the un-compounded *d* of *ādi* does not. Feminine nouns in *-di* form the Nominative Plural in *dyu*, as in *hadyu* (**haḍḍyah*), II, 7; *nādyu* (*nādyah*), VI, 4. As in the case of masculine present participles (§ 193), the course of development is similar to that of the Nominative Singular of *a*-bases, in which *aḥ* has become *u*. There is one instance of the Nominative Plural of a *u*-base. It is *bindū* (id.), II, 6; but this is really a Tatsama Nominative Dual.

196. **Plural, Accusative.** The Accusative Plural is the same in form as the Nominative Plural. Examples are:—*pāna* (*prānān*), IV, 6; *dasā* (*dasāḥ*), VIII, 5; *rijjī* (**ṛddhyah* for *ṛddhīḥ*), XI, 9. In IV, 6, *carya* (*carūn*) is apparently an Accusative Plural, and is formed on independent lines. It is the same as the Mod. Ksh. *carē* (written *carya*).

197. **Plural, Vocative.** Vocatives Plural are *janāu* (*janāḥ*), and *dhāu* (*dhā'tārah*), both in XIII, 6.

198. **Plural, Instrumental.** The Instrumental Plural is formed by adding *yu'*. Although here called the Instrumental, this form is used for any oblique case of the

¹ An older form appears in *lavyu* and *yavyu*, the Instr. Pl. of the Demonstrative and Relative Pronouns (see §§ 221, 225). A still older form perhaps appears in *ahhatrihahābhyyu* (*ahhābīha'* of P. is wrong) (*ēhatriṃśatikābhīḥ*), IX, 4, but the passage is corrupt.

plural except the Genitive. That is to say, it may also be used as an Ablative or as a Locative Plural. In the Text it is often not at all easy to say to which of these three cases the form corresponds, and in the following examples I shall uniformly equate them with the Instrumental, it being understood that in each instance the word may be an Ablative or a Locative. Also, I shall give the Sanskrit forms in the plural, even when the dual would more accurately represent the meaning. The following are *a*-bases, masculine and neuter:—*ājyu* (*ādyaih*), IX, 1, 3; *ānandyu* (*ānandaih*), VI, 1; *kavalu* (? wrong for *kavalyu*) (*kavalaih*), VIII, 6; *cōdasyu* (*caturdivasaih*), XIII, 1; *jāgaryu* (*-raih*), X, 5; *dēvyu* (*-vaiḥ*), V, 1; *padyu* (*-daiḥ*), VI, 1; *pūnyu* (*pūrṇaih*), XIII, 6; *palatyu* (*plutaih*), IX, 3; *bhēdyu* (*-daiḥ*), VIII, 5; X, 6; *mantryu* (*-traiḥ*), VII, 6; *rūḥyū* (*-paiḥ*), VIII, 2; *vannyu* (*varṇaih*), X, 4; XI, 7; *vibhāgyu* (*-gaiḥ*), XII, 3; *san̄yū* (? *san̄aih*), VIII, 2a; *savanyu* (*saḍvarṇaih*), X, 5; *sāgaryu* (*-raih*), X, 5.

199. With feminine *a*-bases, we have:—*jēṭhyu* (*jyēṣṭhābhiḥ*), VIII, 5; *daśyu* (? *daśābhiḥ*), IV, 7; *mātryu* (*mātrkābhiḥ*), VI, 5; VII, 7. With *ī*-bases we have:—*siṣṭyādyu* (*siṣṭyādibhiḥ*), X, 8; *dēvyu* (*dēvibhiḥ*), X, 8; *vāmēsyu* (*vāmēsibhiḥ*), III, 7; IX, 1; *vicyu* (*vṛttibhiḥ*), X, 5. We have perhaps a *u*-base in *taniyu* (? *tanubhiḥ*), III, 7. With a consonantal base we have *vācyu* (*vāgbhiḥ*), IV, 4.

200. **Plural, Genitive.** The Genitive Plural is formed, as in Prakrit, by adding *na*, with the final vowel of the base lengthened. For *a*-bases we have:—*kamalāna* (*hamalānām*), IX, 6; *gōnāna* (*ghōṇānām*), VI, 2; *jaṅgamāna* (*-nām*), IV, 2; *diśāna* (*dīśām*), IX, 5; *dēvatāna* (*-nām*), V, 6; *nikhilāna* (*-nām*), IX, 6; *parivāhāna* (*pravāhānām*), III, 7; *paryantāna* (*-nām*), I, 5; *pīṭhānu* (*-nām*), V, 5; *pūjanāna* (*-nām*), X, 3; *bhōnāna* (? *bhuvanānām*), III, 4; *lōpāna* (*-nām*), XI, 6; *vannāna* (*varṇānām*), IV, 4; *vāhāna* (*-nām*), III, 7; *siṣyāna* (*-nām*), IX, 5; *hōmāna* (*-nām*), XI, 6.

201. Similarly, but not from *a*-bases are *bhūmāna* (*bhruvōḥi*), VI, 2; *vaktratāna* (*vakra°* of P. is not borne out by my MS.) (? *vaktratālvōḥ*), VIII, 2a; *śirāna* (*śirasām*), IV, 2.

202. With *ī*-bases, we have:—*khēcarīna* (*-nām*), XII, 4; *dēvīna* (*-nām*), VII, 3, 4; *prajāpātīna* (*-nām*), IX, 6; *yādīna* (*yādīnām*), VII, 7; *raśmīna* (*-nām*), VIII, 6; *vallīna* (*-nām*), IX, 7.

203. Semitatsama Genitives Plural are *ciśā* (*tviṣām*), VI, 1; and *cauradiśā* (*caturdiśām*), VI, 2.

	Singular.	Plural.
Nom. Acc.	<i>mēlāpu</i> , <i>-pō</i> , <i>-pa</i>	<i>mēlāpa</i> , (rarely) <i>-pē</i>
Instr.	<i>mēlāpē</i> , (rarely) <i>-pēna</i>	} <i>mēlāpyu</i>
Dat.	(<i>pāyāyu</i>)	
Abl.	<i>mēlāpā</i>	
Gen.	<i>mēlāpasa</i> , (<i>nānuka</i> , <i>pavanānu</i>)		mēlāpāna
Loc.	<i>mēlāpī</i> , <i>-pē</i> , <i>-pa</i> , <i>-pō</i>	<i>mēlāpyu</i>
Voc.	....	<i>janāu</i>

The above corresponds to the first declension of Mod. Ksh.

204. We thus get the following schemes of declension :—

(1) *Masculine and Neuter nouns.* Nearly all of these are *a*-bases. There are also some *u*-bases, which are treated as *a*-bases.

	Singular.		Plural.
205. (2) <i>Feminine ā-bases.</i>			
	Nom. Acc. <i>dēvata</i>		<i>dēvata</i>
	Instr. <i>dēvati</i>	}	<i>dēvatyu</i>
	Dat.		
	Abl. <i>dēvati</i>		
	Gen. <i>dēvati</i>		
	Loc.		
	Voc. ....		....

The above corresponds to the fourth declension of Mod. Ksh.

206. (3) <i>Feminine ī-bases.</i>			
	Nom.-Acc. <i>dēva</i> (for <i>dēvī</i>), <i>utti</i>		<i>dēvī</i> , <i>nāḍyu</i>
	Instr. <i>diṣṭī</i>	}	<i>dēvyu</i>
	Dat. <i>nābhī</i>		
	Abl.		
	Gen. <i>dēvī</i>		
	Loc. <i>nābhī</i>		
	Voc. ....		....

This also corresponds to the fourth declension of Mod. Ksh. Masculine *i*-bases in Mod. Ksh. take the *ka*-suffix, and then form the second declension. In the present work, the few occurrences of *i*-bases are declined like feminines, except that they have no nominative plural corresponding to *nāḍyu*.

Some feminine nouns ending in *ī* preceded by a dental consonant, change that consonant to a palatal in the oblique cases (i.e. *ty* > *c*, *dy* > *j*). These correspond to the so-called irregular nouns of the Mod. Ksh. fourth declension. Typical examples are :—Sing. Instr. *pativiccī* (*prativṛtṭyā*), (§ 173); Gen. *saccī* (*śaktyāḥ*), (§ 181); Loc. *sañji* (*saṃdhyām*), (§ 189); Plur. Nom. *saccī* (**śaktyaḥ*), (§ 195).

In Mod. Ksh. feminine nouns derived from *ikā*-bases form the third declension. Bases of this class occur in the present work only in the Nominative Singular, as, e.g. *gāsaka* (*grāsikā*) (§ 162). This is quite distinct from the Mod. Ksh. form, which, if it existed, would be **gōsū*.

207. The origin of the above case-forms requires little discussion. Allowing for the phonetic changes that have become developed in the language, all the terminations but one are either Prakrit or Apabhraṃśa. Thus, the terminations *u* and *a* of the Nominative singular of masculine *a*-bases is pure Apabhraṃśa, while the termination *ō* is Prakrit, and may be looked on as a grammatical archaism. Similarly, the termination *ī* of the Instr. Sing. of the same nouns is to be referred to the Ap. *puṭṭī*, and the termination *i* of the Loc. Sing. to the Ap. *puṭṭi*.

The only form which cannot easily be explained from Prakrit or Apabhraṃśa is

the oblique plural in *(v)yu* (§ 198, note ¹). It is, however an old Aryan form, being descended from the Avesta Instr.-Abl. Plur. in *-byō, -vyō*, as in *daēvaē'hyō* (or *-vyō*), equivalent to the Sanskrit *dāvēbhyaḥ*. This form is therefore very important. It shows that, although Śitikaṅṭha's vocabulary was largely taken from Sanskrit, the language he used was not a pure form of Indo-Aryan, but must have descended from an Aryan dialect allied to Indo-Aryan, but also allied to Eranian. It is hardly necessary to point out that, although, for the sake of readers familiar with Indo-Aryan languages, I have hitherto compared Śitikaṅṭha's language with Indo-Aryan, the other declensional forms given above also find their parallels in old Eranian. As I have more than once urged, it is wrong to look upon the Dardic languages (including Kāshmiri) as pure Indo-Aryan languages. The speakers appear to have entered their present seat from over the Hindūkush, and not from the West like the ancestors of the speakers of Indo-Aryan languages. Even at the present day, the Dardic languages show distinct traces of connexion with the Eranian Ghalchah languages spoken immediately to their north in the Pamirs. In those distant days, the Aryans were certainly in many tribes, and spoke many different dialects. Some of these developed into Eranian, others into Indo-Aryan. Some tribal dialects developed in one direction and others in the other. There must have been some tribal dialects of an intermediate character, and I maintain that some of these were the ancestors of the Dards.

NUMERALS.

208. 1. In composition, *eka-* (Ts.), as in *eka-divasa-* (id.), XIII, 5; *eka-ghanō* (-*nah*), XIII, 6. It also takes the form *aka-* in *aka-nāyaka* (*eka-nāyikā*), VII, 1; *aka-randhri* (*eka-randhyē*), VII, 6; *aka-dūta-* (*eka-dūti-*), XIII, 5.

Sing. Nom. Masc. (*ēkaḥ*) *aku*, II, 8; VII, 9; *akku*, II, 6a; *akka* (so P. My MS. gives also *akku* as a v. l.), I, 5; *ēka ēva* > *akuya*, V, 7.

Neut. (*ēkam*) *aku*, VII, 9; XIII, 3; *akku*, III, 4; 'ka, III, 3.

Fem. (*ēkā*) *aka*, III, 7; IV, 5; V, 1; *akka*, I, 3; XI, 3. *ēkā ēva* > *akkai*, I, 4; IX, 1; X, 7; XI, 6.

Instr. (*ēkēna*), *akkēna*, V, 4; XI, 3; *akkē*, X, 2.

Abl. (*ēkasmāt*), *akyā*, VIII, 2.

Gen. (*pratyēkasya*), *patlēkasa*, X, 7.

Loc. (*ēkasmin*), *akathē*, XII, 3.

209. 2. In composition, *dvi-* > *du-*, as in *dugañārē* (*dvigaṇanēna* or *dviguṇitēna*, see § 22), IX, 3; but *dvīsarāḥ* > *dausaru*, II, 8.

Plur. Nom. Masc. (*dvau*) *jū*, II, 6. Cf. Mod. Ksh. *zā-*. Here **dū* > **diū* > *jū* > *zā*, see § 220.

Instr. (*dvābhyām*), *duē*, XI, 7.

Ordinal. Nom. Sing. Masc. *biyu* (*dvitīyah*), VII, 9.

Adverb. *dōdhā* (*dvidhā*), V, 4.

210. 3. In composition, *tri-* > *tri-*, *trē-*, *ti-*, as in *tripāñca* (? *tripāñcakam*), VII, 5; *trēpāvō* (*tripādē*), XIII, 3; *ticārē* (*tricārēna*), VI, 5.

Instrumental, Feminine: *tiē* (*tisṛbhiḥ*), IV, 4.

Ordinal: *tina* (*trīyam*), IV, 3.

Derivatives. Probably forms of *trika-* are *phalati* (? *phalatrikam*), XIII, 1; *trīya* (*trīkam*), VII, 9; *cautriya* (*catustrikah*), XI, 3; *tiyu* (*trīkam*), XIII, 3.

With *traya-*, compare *dhāmatinnayu* (*dhāmatrayam*), XI, 3.

With *tritaya-*, compare *tritayē* (*tritayēna*), VII, 6.

211. 4. In composition, *catuḥ* > *cau-*, *cu-*, and *cā-*. Thus, *cautriya* (*catustrikah*), XI, 3; *caumūla-* (*caturmūla-*), X, 8; *cukhaṇḍa* (*catuṣkhaṇḍā*), X, 7; *cucakḥśara* (*catuṣcakḥśarī*), XIII, 5; *cupāvō* (*catuṣpādē*), XIII, 3; *cākalu* (*catuṣkalah*), VIII, 5. An exceptional form, derived from *cā*, occurs in *capḥḍha* (*catuṣpathē*), VI, 3, in which the *ā* has been shortened before the *pp* (< *ṣp*). Another exceptional form is *cōdasyu* (*caturdivasaiḥ*), XIII, 1.

As an independent cardinal, it takes the form *caura*, which apparently does not change for case (cf. the Mod. Ksh. *tṣōr*). Thus, *caura diśū* (*catuṣṇām*, *diśām* VI, 2; *caura dēvīna* (*catuṣṇām dēvīnām*), VII, 3; *caura ghōṣa* (*catvārō 'ghōṣāḥ*), VIII, 1; *caura caura kama* (*catvāraḥ catvāraḥ kramāḥ*), XIII, 5.

The compound *catvārō 'pi* > *caurō*, XI, 3; and, with *ēva*, we have *gauraya* (read *cauraya*) *mahabhūta* (*catvāry ēva mahābhūtāni*), VII, 8, and *cauraya vicyu* (*catuṣṛbhiḥ*), X, 5.

212. 5. In composition, *pañca-* > *pañca-*, as in *pañca-bhūta pañca-guṇō* (*pañca-bhūtaḥ pañca-guṇaḥ*), II, 8; *pañca-mudu* (*pañca-mudraṃ*), VII, 2; *pañca-vāha-guṇē* (*pañca-dvādaśa-guṇēna*), IX, 1; *pañca-bhāsa* (*pañca-bhāsāḥ*), XI, 1.

The Nominative is *pañca* (*pañca*), II, 6a; Instrumental, *pañci* (*pañcabhiḥ*), X, 8; Genitive, *pañcana* (*pañcānām*), IV, 1.

Derivatives. *pañcaka* (*pañcakē*), XIII, 5; *pañcaka* (*pañcakāḥ*), XIII, 4; *pañci* (*pañcakē*), III, 7.

213. 6. In composition, *śa-* (*śaḥ-*), as in *śa-vanyu* (*śaḍ-varṇaiḥ*) X, 5. *Śaḍvidha* (*śaḍvidhā*), X, 6, is a Ts.

The Nominative is probably *śa*, which may be compared with the Mod. Ksh. *shē-*, but no example of it has been noted. This word is perhaps used for all cases (as in "four"). At least *śō* (*śaḍbhir apī*) appears in X, 5 as an emphatic Instrumental Plural.

214. 7. This occurs only once in *satta śikhā* (*sapta śikhāḥ*), Nom. Plur., VI, 4.

215. 8. In composition, *aṣṭa-* (*aṣṭa-*), as in *aṣṭa-pīṭha-* (id.), IX, 2; *aṣṭa-mūci* (*aṣṭa-mūrṭiḥ*), IX, 6; *aṣṭa-saccī* (*aṣṭa-saktyāḥ*), VII, 3. A *v*,—possibly a reminiscence of *aṣṭau*,—is inserted in *aṣṭava-aṣṭa-guṇē* (*aṣṭāṣṭa-guṇēna*), IX, 2; but, in the same verse, we find *aṣṭāṣṭē* (*aṣṭāṣṭābhiḥ*).

No instance has been noted of the Nominative. For the Instrumental, in every instance the word is declined as a singular *a*-base, so that we have *aṣṭāṣṭē* for *aṣṭāṣṭābhiḥ* as above, in IX, 2, and also *aṣṭē* (*aṣṭābhiḥ*), IX, 3. It is weakened, probably *metri gratia* in *aṣṭi*, VIII, 2, 4. *Aṣṭābhir eva* > *aṣṭiya* in IX, 3. The Genitive is, however, treated as a plural in *aṣṭana* (*aṣṭānām*), IX, 5.

216. 9. This occurs only once, in *nava* (id.), XI, 3.

217. 10. Similarly, we have *daśa* (id.), VI, 4, which is either in composition (*daśa-nāyju* < *daśa-nāḍibhiḥ*), or else, like "four," etc., is treated as an indeclinable.

Higher numbers are :—

12. In composition, we have the Ts. *dvādaśa-*, XI, 4; and the true Ksh. Tbh. *vāha-* (*dvādaśa-*), in IX, 1.

For the Nominative-Accusative (*dvādaśa*), we have *vāha*, X, 8; XI, 3; written *bhā*, *metri gratia*, in VI, 4. As in the case of "eight," the Instrumental is *bāhi* (? *vāhi*) (*dvādaśābhiḥ*), VII, 3 (see, however, "24," below). The Genitive is *vāhana* (*dvādaśānām*), III, 7; VII, 9.

13. In composition, *trayōdaśa-* > *trōvaha-*, VII, 9. There is no instance of the Nominative, but *trōvaha* is probably employed for any case. In XIII, 5, it is either the Instrumental (*trayōdaśābhiḥ*) or the Genitive (*trayōdaśānām*), I am not certain which.

As Ordinals, we have *tōdaśa* (*trayōdaśi*), Nom. Sing. Fem., X, 7, and a Locative from a base in *-ma-*, *tōdaśami* (**trayōdaśamē*), IV, 3.

14. The Nominative is *cuddaha* (*caturdaśa*), XI, 3; XII, 7.

15. The Instrumental is *pañcadahi* (*pañcadaśābhiḥ*), IX, 3, a singular form agreeing with a singular noun (*pakārē* < *prakārēṇa*). There is also *pañcadahēya* (*pañcadaśābhir eva*), XI, 7, the noun with which it is in agreement not being expressed.

16. In composition, or used as an indeclinable, we have the Ts. *ṣōḍaśa* in VII, 3, 4; XI, 4.

17. In composition, *saptadaśa*- > *sattadaśa*-, X, 7.

18. The Nominative is *aṣṭadaha* (*aṣṭadaśa*), XI, 3.

24. The Nominative is *cuvīha* (*caturvimsatih*), VII, 6. The Genitive is *cuvīhi* (*caturvimsatēh*), VII, 3. This is a feminine form as in Sanskrit. In the same verse we have *bāhi*, which I have explained above, under "12," as an Instrumental (*dvādaśabhih*), and which can hardly be a Genitive, as the Sanskrit form is not feminine.

26. Nominative, *savvīha* (*ṣadvimsatih*), XI, 4. Note the change of *ṣ-* to *ś-*.

31. The Instrumental Plural of the *-ka*-derivative is *akkatrihakābhyu* (*ekatrim-satikābhih*), IX, 4. The printed text has *akkabiha*°, but the Commentary shows that this is a mistake. The case termination, *bhyu*, as it stands, is a mixture of Sanskrit and Kāshmiri, and should probably be the Eranian termination *vyu*. See § 207. The passage is, however, corrupt, and hence doubtful.

33. The Instrumental is *trētrihi* (*trayastrimsatā*). As in Sanskrit, the word is singular. Cf. also "24."

60. In composition, we have the Ts. *ṣaṣṭi-kalō* (*ṣaṣṭi-kalah*), X, 8.

64. The Genitive is a plural, *cuhaṣṭana* (**catuṣṣaṣṭinām*), IV, 4. For the ordinal, we have *cuhaṣṭa-* (*cuhaṣṭa-* of P. is a misprint) (*catuṣṣaṣṭa-*), IX, 2, and, with the *-ka*-suffix, *cuhaṣṭaka-* (*catuṣṣaṣṭaka-*) IX, 4.

65. For the ordinal, we have *pañcahaṣṭa-* (*pañcaśaṣṭa-*), IX, 1, 2; and Nom. Sing. Masc. *pañcahaṣṭu* (*pañcaśaṣṭah*), X, 8; XI, 4; In IX, 4, *pañcahaṣṭu* (*pañcaśaṣṭam*) is an Accusative Singular Masculine agreeing with *bhūmu* (*bhūmim*), which is here treated as masculine.

218. We therefore have the following cardinals:—

	Modern Kāshmiri.
1. <i>akku, aku.</i>	<i>ak-</i> .
2. <i>jū</i> (ord. <i>biyu</i>).	<i>zā-</i> .
3. <i>ti-, tri-, trē.</i>	<i>tri-</i> .
4. <i>caura, cu-</i> .	<i>tsōr.</i>
5. <i>pañca.</i>	<i>pōnts.</i>
6. <i>sa-</i> .	<i>shē-</i> .
7. <i>satta.</i>	<i>sat-</i> .
8. <i>aṣṭa-</i> .	<i>aith, oth.</i>
9. <i>nava.</i>	<i>nav.</i>
10. <i>daśa</i> (Ts.).	<i>dah.</i>
12. <i>vāha</i> (<i>bāha, bhā</i>).	<i>bāh.</i>
13. <i>trōvaha-</i> .	<i>truwāh.</i>
14. <i>cuddaha.</i>	<i>tsōdāh.</i>
15. <i>*pañcadaha.</i>	<i>pañdāh.</i>
16. <i>ṣōḍaśa-</i> (Ts.).	<i>shurāh.</i>
17. <i>sattadaśa-</i> (sTs.).	<i>sadāh.</i>
18. <i>aṣṭadaha.</i>	<i>aradāh.</i>

	Modern Kāshmiri.
24. <i>cuvīha.</i>	<i>ṭṣōwuh.</i>
26. <i>savvīha.</i>	<i>shēwuh.</i>
31. <i>*akkatvīha.</i>	<i>akatr^{ah}.</i>
33. <i>*trōtrīha.</i>	<i>tēyētr^{ah}.</i>
60. <i>ṣaṣṭi- (Tss.).</i>	<i>shōṭh.</i>
64. <i>*cuhaṣṭa.</i>	<i>ṭṣōhōṭh.</i>
65. <i>*pañcahaṣṭa.</i>	<i>pōntsahōṭh.</i>

These numerals are sometimes treated as indeclinables, and are sometimes declined in the singular, and sometimes in the plural. Note that the sibilant conjunct *-ṣṭ-* is retained unchanged; that (except in Tss.) *-ṣ-* > *h*; that initial *ṣ-* > *ṣ*, except in the Tss. *ṣōḍasa-* and *ṣaṣṭi-*; and that initial *s-* remains unchanged in *satta*.

PRONOUNS.

219. I have noted only one occurrence of the **Pronoun of the First Person**. It is in the Instrumental Singular (XIV, 1), *mi* < *mayā*, which may be compared with the Mod. Ksh. *mē*.

220. Similarly, I have noted only one occurrence of the **Pronoun of the Second Person**. It also is in the Instrumental Singular (XIII, 1), *ci* (= *tvayā*), which may be compared with the Mod. Ksh. *tsē*. In Mod. Ksh. the Nom. Sing. is *ts^a-*, which can at once be referred to an original **tiū*, the *ti* regularly becoming *ts*, and *ū* regularly becoming *a* (§§ 82, 24). This **tiū* has survived intact in the Bashgali Kāfir *tiu*, thou. In Dardic languages, it is quite common to pronounce *ū* with a preceding *i*-sound, just as, in English, we pronounce "duty" as "dyuty." See my "Piśāca Languages," p. 15.

221. For the **Pronoun tad**, we have the following:—

Sing. Nom. Masc. *sō* (*saḥi*), I, 5; II, 1; III, 4; IV, 4. In II, 6 (gender doubtful), 6a and XII, 2, this is weakened to *su*. In XII, 7, *sa* (*saḥi*) is to me doubtful. *Sa ēva* > *sōyē* (III, 9; X, 3).

Neut. *sō* (= *tad*), IV, 1, 2; XI, 4; *sa* (= *tad*), X, 1. *Tad ēva* > *tēyē* (III, 8), *tēya* (XI, 5), and *sōyē* (X, 3).

Fem. *sā* (*sā*), I, 4; IX, 1, 2, 5.

Instrumental. *tēna* (T̄s.), XIV, 1.

Ablative. *tā* (*tasmāt*), II, 6a; IX, 5.

Genitive (Masc. and Neut.). *tasa* (*tasya*), II, 5; III, 2, 3; IV, 4; (Fem.) *tasa* (*tasyāḥ*), II, 1.

In Mod. Ksh. there is a dative singular, *tath*, used only with reference to inanimate nouns. This word appears here under the form *tatha* (? < *tathā*), which is used both as a Genitive Singular and as a Locative Singular, and always referring to something inanimate. The references are: (= *tasya*), IV, 1; V, 6; X, 1; (*tasmin*), III, 6; XI, 5,

Locative. Except the above, there are no occurrences of the Locative Singular.

Plur. Nom. Masc. *tē* (id.) XIII, 4; XIV, 1. *ta ēva* > *tēyē*, II, 6; *sēya* (? *ta ēva*), XI, 5.

Instrumental. *tavyu* (*taiḥ*), VI, 1 (cf. §§ 198, 207).

Ablative. *tavyu* (*tēbhyaḥ*), II, 5 (cf. id.).

Genitive. *tēna* (*tēṣām* for *tayōḥ*), II, 6.

Locative. No occurrence.

222. Connected with the Sanskrit **Pronominal base eṣa-** are the following Nominatives Singular Masculine: *ēsu*, IV, 4, and *ēṣu*, III, 8; XIII, 6. The forms with *ṣ* are evident scribal sanskritizations. With the regular Dardic change of *ṣ* (*s*) to *h*. we have *ēhuya* (*ēṣa ēva*), II, 6a.

For the Neuter, we have *ēhu* (*ētad*), XII, 4, and *ēha*, II, 8.

For the Accusative Singular Masculine, we have *ēhu* (*ētam*), XII, 6; XIV, 1.

223. Corresponding to the Sanskrit **idam**, we have a Nominative Singular

Masculine *iha* (II, 2) and an Accusative Singular Masculine *ima* (X, 1). A Locative is *itha* (III, 4). These may be compared with the Mod. Ksh. Nom. *yih*, oblique bases *yim-* and *yith*. Compare also the Sanskrit *ittham*.

When used adjectivally, one form, *ē*, appears to be used, as in many Indian languages, for any case in either number. Thus, in IV, 3, it = *asmin*, and in VIII, 6 and IX, 4, it = *ebhiḥ*.

224. In Mod. Ksh. the Sanskrit **Pronominal base ēna-** survives in the Dative Singular *nōth*, and in the declensional base *nōm-* or *nēm-*. Similarly, we have here an Instrumental Singular *nē* for *ēnēna* (VIII, 3), and an Ablative Plural *nyu* for **ēnēbhyah* (II, 8).

225. For the **Relative Pronoun**, we have a Nominative Singular Masculine *yō* (*yah*), II, 1; XII, 2. *Yau* (IX, 3) is probably only a scribal mistake for *yō*. One example of the Nominative Singular Feminine occurs in *yasa* (for *yā*), III, 2. This anomalous form is borne out by the Mod. Ksh. form *yōssa*. No example occurs of the Instrumental or Ablative Singular. The Genitive Singular occurs as *yasa* (*yasya*) in I, 5; II, 4, and as *yasu* in *yasu yasu jantusa* (*yasya yasya jantōḥ*) in III, 2. The Mod. Ksh. Genitive *yēsōnd* appears in IV, 3, as *yasandu*.

The Nominative Plural is *yē*, XIII, 4. The Instrumental-Ablative Plural is *yavyu*, II, 4; III, 4. Regarding this form, see §§ 198, 207. The Genitive Plural Masculine is *yēna* (XII, 7). We have also *yōna* in *yōna śirāna* (*yēśām śirasām*), IV, 2, if *yōna* is not a scribal error for *yēna*, and if my division of the words is correct.

226. For the **Interrogative Pronoun**, we have *ku* (*kah*), IV, 1, Nominative Singular Masculine, and *kuyanū* for *kim anyat*, V, 6.

227. The following are miscellaneous pronominal forms. Others will be found under the head of Indeclinables (§ 269ff.).

anyat. For this, we have *kuyanū*, mentioned above (§ 226), and *añña* (*anyā*), X, 6, Nominative Singular Feminine.

para-. We have *parā* (*parā*), Nominative Singular Feminine, X, 4; *para* (*parāḥ*), Nominative Plural Masculine, XIII, 4; *parāna* (*parēśām*), III, 8; IV, 2.

idr̥ṣa-:—*isatū*, II, 3, Nominative Singular Masculine; and *idr̥ṣa* (*-sī*, Ts.), IX, 4, Nominative Singular Feminine.

iyat-:—*itaya* (*iyatī*), IX, 7, Nominative Singular Feminine; and *itāya* (*iyataḥ*), II, 6, Nominative Plural Masculine. This last is doubtful.

CONJUGATION OF VERBS.

228. **Present.** In Modern Kāshmiri the original Present has taken a Future meaning, as is the case with the Ghalchah languages of the Pamirs. In the MNP. this is not the case, for the original Present meaning is retained. In Mod. Ksh. poetry, however, the tense frequently retains its present meaning.

229. For the **first person singular** there is only one example, based on the Sanskrit denominative verb *namasya-*. It is *namasā* (*namasyāmi*), VII, 1, I do reverence to. The termination *ā* has survived in Mod. Ksh. *a*, as in *kara*, I shall do Cf. Av. *spasyā*, I view.

No instance occurs of the **second person singular**.

230. The **third person singular** has several forms. No distinction seems to have been made between an original Parasmaipada and an original Ātmanēpada. The original Ātmanēpada termination *tē* has been preserved as *ti* in one sTs. *ākalati* (*ākalyatē*), II, 6. The form is due to the need of rhyming with *avayava ti* (*avayavō 'pi*) in the same verse.

231. A very common termination is *i*. This still survives in the Mod. Ksh. *kari*, he will do. It represents an original Sanskrit *ti* in : *kari* (*karōti*), III, 6; V, 5; XI, 8; *chandi* (? *chinatti* or *chandayati*), XI, 7; *jayi* (*jayati*), I, 5; *dari* (*dharati*), VIII, 2; *pasari* (*prasaratī*), VIII, 2; *phuri* (*sphurati*), I, 5; *sammajji* (*sammajjati*), XII, 2.

It represents an original Sanskrit *tē* in : *jāñji* (*jñāyatē*), XII, 1; *diśsi* (*dyśyatē*), IX, 7; *parisīji* (*spṛśyatē*), XII, 1; *pūji* (*pūryatē*), V, 7; VI, 4 (bis); *pūjūji* (*pūjyatē*), IX, 1; *bhaji* (*bhajatē*), XI, 5; *bhāji* (*bhrājatē*), X, 7; *bhāvi* (*bhāvyyatē*), IV, 7; *bhuñji* (*bhuñktē*), V, 5; *rañji* (*rajyatē*), VIII, 5; *rāji* (*rājatē*), I, 3; X, 7; *sandhīji* (*samdhīyatē*), VIII, 5; *sāpajji* (*sampadyatē*, Mod. Ksh. *sōpani* or *sapuzi*), XII, 2. While, as we have seen above, *bhāvyyatē* > *bhāvi*, on the other hand, for the sake of rhyme, in III, 4, *udbhāvyyatē* > *ubbhāvē*.

232. As in the case of the Locative Singular in *i*, the final *i* of this verbal form is liable to be changed to *a*. In the word *asta* (*asti*), III, 3, this is perhaps due to the exigencies of rhyme. Except in one other case, the change has been noted only in the case of causal verbs, viz. *akamēya* (*ākramayati*), V, 5; *gāhēya* (*grāhayati*), V, 5; *pāvēya* (*prāpayati*), IV, 5; *bhākṣēya* (*bhākṣayati*), XI, 7. The one exception is *bhāya* (*bhāti*) XI, 1, and this, comparing the form with a well-known peculiarity of Mod. Ksh. shows that the change is merely a scribal variety of spelling, due to the presence of the *y* immediately preceding the *i* or *a*. In Mod. Ksh. *ya* is pronounced *yi* or *yē*. So universal is this that a word which has naturally a *yi* or *yē* is commonly written with *ya*. Thus, the word *āgvāyē* or *āgvāyi*, to a command, is usually written *āgvāya* (आग्वाय or आग्वाय). Forms like *akamēya*, etc., therefore show us that the same pronunciation of *ya* was current in Kashmir in Śitikanṭha's time. Finally, the doubtful form *parisēta*

(III, 7; VIII, 2, 4) may be quoted, if it is a Ts. representative of *pariśētē*, but regarding this word, see under the Conjunctive Participle (§ 254).¹

233. In the case of two causal verbs, the third person singular ends in *-u*. These are *vātēu* (? *vartayati*), XI, 8, with the first *a* lengthened to rhyme with *bhāvēu*, XI, 9. As will be seen from the text, the whole passage is corrupt, and we cannot be certain of the correctness of these forms. Perhaps, moreover, they may, if correct, be causal Past Participles, see § 262. Cf. *akamurēu* dealt with in §§ 248, 262, 267.

234. Another form of this person ends in *-ha* preceded by a long vowel, a form for which I am unable to suggest a certain derivation. Possibly, the *ha* may represent the verb substantive. The examples are: *anumūha* (*anumīyatē*),² VII, 6; *tapōha* (*tr̥pyatē*), VI, 3; *thyōha* (*sthiyatē*), XII, 7; *pathyōha* (*prathyatē*), XII, 7; *bhāvēha* (*bhāvayati*), V, 6. Rhyming with *bhāvēha*, in the same verse, is *sāvēha*, the original of which is to me obscure. Of the above, the forms in *ōha* are apparently all passives, while *-ēha* belongs to causals. Another doubtful form which seems to be connected with those in *-ha* is *nirīha* (IX, 4). This may be compared with the Mod. Ksh. *nēri*, he will emerge.

235. No examples occur of the **first or second person plural**.

236. The **third person plural** ends in *na*. Cf. the Mod. Ksh. *karan*, they will make.³ The one example of a simple verb is *bhayana* (*bhavanti*), XI, 5. All other identified examples that occur are of causal verbs, viz.: *avatārēna* (*avatārayanti*), X, 1; *ubbhāvēna* (? *udbhāvayanti*), X, 3; *galāvēna* (*gālayanti*), VIII, 4; *cavvēna* (*carvayanti*), X, 4; *parāvēna* (VIII, 4) or *pāvēna* (X, 3) (*prāpayanti*); *bhāvēna* (*bhāvayanti*), V, 2; *vāyēna* (? *vādayanti*), V, 2. As pointed out in § 169, some of these are doubtful, and may be Instrumentals Singular.

237. **Imperative**. The only other finite tense of which examples have been noted is the Imperative. For the **second person singular** we have *bhaja* (*bhaja*), X, 1, which is apparently a Ts. In other cases, this person seems to end in *u*. So also, in Mod. Ksh., we have *karu-m*, make me!, where the old termination *-u* is preserved, although it is dropped in *kar*, do!, the bare form without pronominal suffixes. This form of the Imperative is also that usual in Apabhraṁśa, see Pischel §§ 106, 468. Examples here are: *jānu* (cf. *jānau*, below) (*jānīhi*), IX, 5; *paśsu* (*paśya*), III, 8; *bindu* (? *vindu*) (*vindasva*), VIII, 3. In IV, 2, the termination is *-au*, in the word *jānau* (cf. *jānu*, above) (*jānīhi*).

¹ It has already been pointed out (§ 228) that Modern Kāshmiri agrees with the Eranian Ghalchah languages in using this original present tense with the meaning of the Future. The same is the case with other Dardic languages, such as *Siṅā* and *Khōwār*. Here it may be added that the termination *-i* of the third person singular is typically East Eranian. Compare *Paštō wahi*, he beats, and *Munjāni* (Ghalchah) *dēhi*, he will beat. So also, for other Dardic languages, we have *Siṅā śidi* and *Khōwār dōi*, he will beat. I know of no modern North-Western Indo-Aryan language in which the third person singular of the Old Present ends in *-i*. The only modern Indo-Aryan languages that have this termination are *Marāṭhī* (*māri*) and *Baghēli* (*māri*), both of which forms are susceptible of special explanations.

² This word is probably incorrect. It rhymes with *cuvīha*, and we should therefore expect *anumīha*. Possibly the *ū* represents the Mod. Ksh. *ū*, the sound of which, in poetry, is capable of rhyming with *i*. On the other hand, most of these forms end in *-ōha*, and the easy interchange of *ū* and *ō* suggests a possible *anumōha*, but in that case there would be a false rhyme. Cf. § 238. In Mod. Ksh. *ū* is commonly written *ū*.

³ Cf. Professor Turner in J.R.A.S., 1927, pp. 237-8.

In VII, 2, *parisaṅkhina* is translated in the commentary by *parisaṅkhyāhi*. If it is really a second person imperative, it presents a form entirely different from the above. Perhaps it is a third person singular or plural used in the sense of the second person singular. Such an idiom is common in modern Indian vernaculars, when it is intended to indicate respect.

238. There is one example of the **third person singular**: *viḥayūna* (*viḥayatām*), I, 4. This also may possibly be a plural used honorifically (= *viḥayantām*). On the other hand, it is possible that the *ū* represents the Mod. Ksh. *ū*, as in *anumūha*, given above (§§ 24, 234, note). If that is the case, we may compare the Mod. Ksh. *karin*, let him, or them, make, as *ī* is sounded something like a long *ī*. A doubtful instance of this person of the imperative is *bhāsūnyu*, (XIII, 6), which the commentary translates by *bhāsatām*.

239. One example of the **second person plural** occurs in *bhāḥiva* (*bhājata*), XII, 6. The commentary translates this by *bhājantu*, but the meaning is certainly that of the second person. It may be compared with the Mod. Ksh. *kariv*, make ye! For the termination *-va* of *bhāḥiva* I would suggest that it is the pronominal suffix of the second person plural, which is common in Mod. Ksh., as *wa*, an independent pronominal suffix added to verbs, as in *karē-wa*, he will make you.

240. No certain example occurs of the **third person plural**.

241. **Past**. No instance of the occurrence of the Past Tense has been noted. The Past Participle is freely used as a Past Tense, and is discussed below (§§ 246ff.).

242. **Future**. No instance of the occurrence has been noted. As stated ib. § 228, in Mod. Ksh. the original Present is used with a future meaning.

243. **Present Participle**. The Present Participle is used as a Present Tense Definite. Thus, *avataranda* (*avatarantaḥ* for *avataranti*), II, 4; *parinamanda* (*parinamantaḥ* for *parinamanti*), VII, 8; *piṣandu* (*spṛsantaḥ* for *spṛsanti*), IV, 3. It will be observed that *nt* > *nd*,¹ and that these three Nominatives Plural take the terminations of *a*-bases (see §§ 191, 193). In one case (an onomatopœic) *nd* has apparently become *n*, or possibly the form is corrupted from the Ātmanēpada. It is *gumūna* (*gumagu-māyamānā*), I, 4.

244. **Noun of Agency**. A Noun of Agency is formed by adding *vānu* to the root. Its Feminine ends in *vāñī*. The same form appears as *wōn*" (f. *wōñ*"") in the *Lallā-vākyāni* (see p. 219 of the R.A.S. edition). In Mod. Ksh. it has become *wun*" (f. *vūñ*""). In all these the primary meaning is that of a Noun of Agency, as in Mod. Ksh. *kara-wun*" , a doer; but it is frequently used in the sense of a Present Participle, 'doing,' and is usually so translated by Paṇḍits. We may compare the Sanskrit suffix *vān* added to Past Participles, as in *kṛta-vān*, one who has done.

245. Both the Masculine and the Feminine forms are declined as nouns, and the following forms have been noted,—all with the meanings of Present Participles:—

Masculine. This has been noted in two occurrences only, both in the Nominative Plural (§ 193), viz. *'dalavānē* (*adōlāyamānāḥ*) and *vasavānē* (*vasantaḥ*), both in XII, 6.

¹ See Professor Turner, *loc. cit.*

It will be observed that both are translated as Present Participles. Possibly *ālivanu* (? *ālīyamānaḥ*), XII, 4, belongs to this group.

Feminine. For the Feminine, we have as Nominatives Singular (cf. § 164): *bhajāvāñī* (*bhājanti*), V, 3; *milāvāñī* (*milanti*), III, 7; *vahavāñī* (*vahanti*), III, 7; *samāvāñī* (*śāmyanti*), I, 3. For the Instrumental Singular (§ 174), we have:—*uyavāñī* (*udyatyā*, translated in Comm. by *uditayā*), XI, 2; *samāvāñī* (*sāmyantyā*), XI, 2.

246. **Past Participle.** This is commonly used for the finite Past. In the case of Intransitive Verbs, it agrees with the subject in gender and number. In the case of the Past Participles of Transitive verbs, which are necessarily passive in meaning, they agree with the object in gender and number, the subject being put into the Instrumental case. The Sanskrit neuter gender is, of course, represented by the masculine.

247. In the following, the original *t* of the Sanskrit Past Participle has, for one reason or another, been preserved:—*uditu* (*uditah*), VI, 1; *ākalitē* (*ākalitah*, nom. pl. m.), X, 8; *kitta* (*kḷptā*, nom. sg. f.), V, 1; X, 2; *gata* (*gatam*, nom. sg. neut., cf. *gau*, § 248), XIV, 1; *chutta* (*chuptā*), I, 4; *niṣṭhita* (*niṣṭhitah*, nom. pl. m.), XIII, 6; *valitē* (*valitah*, id.), X, 8; *vātō* (XIII, 1) or *vōtu*¹ (X, 1) (*avāptam*, nom. sg. neut.).

248. In the following, the original *t* of the Sanskrit Past Participle has, for one reason or another, been elided:—*akamurēu* (translated in the Comm. by *akramikṛtya*, but probably the Past Participle of a secondary Causal Verb, cf. §§ 233, 262, 267, XI, 2; *upalakṣu*² (*upalakṣitah*), IV, 4; *ubbhāvō* (*ubbhāvitah*), XIII, 6; *kṣavū* (*kṣapitah*), XII, 5; *gau* (*gataḥ*, cf. *gata*, § 247, above), VI, 1; *cāvū*³, he entered, IX, 4; X, 8; XI, 4; *thāvū* (*sthāpitah*, -*tam*), III, 4; XII, 4; *thāvū* (*sthāpitah*), IX, 3; *mārāvē* (*smāritah*, nom. pl. m.), XIV, 1.

249. In X, 6, we have *pasāū* and *khasgū*, which the Comm. equates with *prasṛtā* and *khaṇḍitā* respectively. The termination *-ū* is puzzling. It may be the Mod. Ksh. method of writing the feminine termination *-ū*, which is usually written *ū*. The origin of the base *khas-*, with this meaning, is unknown to me. In Mod. Ksh. *khas-* means "rise."

250. In the following a *y* has been inserted in the place of the elided Sanskrit *t*:—*aṅkuriya* (*aṅkuritā*, nom. sg. f.), III, 5; *āya* (*āgatā*, id.), II, 6; X, 1; *udiyō* (*uditah*), II, 5; *kiyu* (*kṛtam*), V, 2; *camyō*⁴ (*cāntah*), II, 3; *thiya-* (*sthita-*), V, 1; *thiyya* (*sthitah*,

¹ Here we have an instance of the epenthesis universal in Mod. Ksh., in which the corresponding word is *vōtu*. Here, in one case we have the pronunciation written out (*vōtu*), and, in the other case, the etymological spelling (*vātō*). See § 14.

² Probably for *upalakṣyu*. In Mod. Ksh. *ṣ > ś*, which is considered to be always followed by *y*, even when not so written.

³ I cannot connect this with any Indo-Aryan root. In Mod. Ksh. it is *√ats-*, *atsi*, he will enter, *tsāv*, he entered. It reappears in other modern Dardic languages, e.g. in Bashgali and Wai-ālā Kāfir *√ats-*, and Veron *√jots-*, to come. These can be compared with the *√yati-*, to come, of Shighni, and with cognate words in other Ghulchah languages. The word appears to be Eranian, but the origin is, I believe, not known. Geiger, G.I.P., I, ii, 323, compares the Kurdish *√hāt-*. In Mod. Ksh., *-āu* is a suffix commonly used to form one of the four past tenses.

⁴ *Casyō*, of the printed text, is a misprint. My MS. gives *camyō*. The word is a regularly formed Prakritic participle from *√cam-*. Cf. Mod. Ksh. *√tsam-*, *alpībhavanē*, Past *tsamyō(v)*.

nom. pl. m.), II, 6; (*sthitā*, nom. sg. f.), XII, 3; *rahiya* (*rahitah*), V, 3; *vapayō*¹ (*uptah*), II, 5; *vikasiya* (*vikasīlā*), V, 3; *saṅkamyō*² (*saṅkrāntah*), II, 3.

251. An irregular form, borrowed direct from Prakrit is *dinnē* (Pr. *dinnā*, nom. pl. m.), given (II, 6). There is, however, some doubt about this, as the Comm. apparently equates the word with *dybdhāḥ*. Doubt is also thrown on my identification by the fact that our author also has *datta* (*dattā*, nom. sg. f.) in III, 2, and *datta-* (Ts.) in V, 5.

252. In Mod. Ksh., pronominal suffixes are regularly added to Past Participles. One of these is *-n*, meaning "by him," or "by her." I have noted three examples of this in our text, the suffix being *-na*, with the same meaning. These are:—*kamō-na* (*krāmītas tēna*), XI, 2; *bhāsāvō-na* (*bhāsīlas tayā*), XI, 2 (this is doubtful); and *vamō-na* (*vāntas tēna*), III, 9. In the last, *vamō* is a modern Past Participle, based on the ✓ *vam-*.

253. In XI, 1, we have *samicī*, a form which I am unable to explain. The Comm. equates it with *viśrāntā* (nom. sg. f.), and the word must have this meaning. It is possible that it is the feminine of a Past Participle **samita-* (i.e. *srānta-*), in which the feminine termination has changed the *t* to *c*, exactly as in Mod. Ksh. *ty* > *ts*. There are several examples of this in the declension of nouns, for which see § 82. Or can it possibly be for **samītya*, a conjunctive participle. In the latter case it would be a unique form. Cf. the next §.

254. **Conjunctive Participle.** This form, which corresponds to the Sanskrit Indeclinable Perfect Participle in *-tvā* or *-ya*, is, as in Mod. Ksh., very common. It ends in *-āta*, which corresponds to the Mod. Ksh. Conjunctive Participle in *it* (*h*), as in *karit* (*h*), having done. It may be derived from the Sanskrit termination *-itvā* (cf. Ardhamāgadhī *karitā* or *karētā*). The following examples occur:—*ambēta* (? *ambītvā*), VIII, 5; *ākarsēta* (*ākṛṣya*), IV, 6; *udayēta* (*udītya*), IX, 7; *kṣavēta*⁴ (*kṣapayitvā*), III, 6; *khambhēta* (*skambhitvā*), VIII, 5; *gāhēta* (*(ava)gāhya*), X, 4; *cavvēta* (*carvitvā*), VI, 3; *cahēta* (*cūṣitvā*, cf. Mod. Ksh. ✓*ts^{ah}-*, and § 24), XII, 4; *takṣēta* (*takṣayitvā*), I, 3; *paripūrēta* (*paripūrya*), VII, 5; *pariśēta*⁵ (? *pariśayya*), III, 7; VIII, 2, 4; *ḥallatēta* (*ḥaryastibhūya*), III, 6; *pavisēta* (*pravīśya*), VIII, 4; *pāvēta* (*prāpya*), III, 8; VI, 3; XIV, 1; *piśēta* (*spṛṣtvā*, cf. note on *pariśēta*, above), X, 4; *pēkṣēta*⁶ (*prēkṣya*), IV, 6; *bhakṣēta* (*bhakṣayitvā*), I, 3; *bhajēta* (*bhaktvā*), XII, 1; *bhāvēta* (*bhāvayitvā*), III, 8; VI, 3; VII, 1; *bhāsēta* (*bhāsayitvā*), XI, 3; *bhuñjēta* (*bhuktvā*), V, 3; *manēta* (*matvā*), XII, 1; *rajēta* (*raktvā*, cf. pres. *rajyatē*), XII, 5; *vajjēta* (*varjayitvā*), X, 5; XII, 5; *vaḍēta* (*vēṣṭayitvā*, cf. Pr. ✓*vōdh-*, Mod. Ksh. ✓*wal-*), IV, 6; *viśāmēta* (*viśrāmya*, cf. the next), XII, 5; *viśāmēta* (? *viśrāmya*, so equated in Comm. Cf. the preceding), XII, 5; *samēta*

¹ A Ksh. Past Participle from the ✓*vap-*.

² Another Ksh. Participle, for **saṅkrāmītah*. The *saṅkasyō* of the printed text is a misprint. The form is that of the Nom. sg., but it is in agreement with more than one masculine noun, and we should expect the plural.

³ Original has *ākarsata*, which the rhyme with *pēkṣēta* shows to be a mistake, unless, we should also read *pēkṣata*, which would improve the metre. See note to § 163.

⁴ For *sarīha pūkṣavēta*, read *sarīpu kṣavēta*.

⁵ Cf. *śēta*, below. But this word, *pariśēta*, may be a Ts. for *pariśēt* (§ 232.) In the face of the Passive *pariśīji*, for *spṛṣyatē* (see § 258), we might also take it as equivalent to *spṛṣtvā*, but the meaning of VIII, 4 (cf. Comm.) is against it.

⁶ See note ³ above.

(*samitvā*), III, 6; *śīta* (*śayitvā*, cf. *pariśēta*, above), VIII, 2; *samāsēta* (*samāsya*), XI, 3; *sēvēta* (*sēvitvā*), XII, 5.

255. In Mod. Ksh., *ī* and *ē* are interchangeable (see § 20), and we can therefore add the two following (both in VIII, 6) to the above:—*kavalīta* (*kavalayitvā*) and *valīta* (*valayitvā*).

256. In IV, 7, we have the word *vibhajīrō*, which the Comm. equates with *vibhajya*. I am unable to explain this as a Kāshmiri form, although in certain Indian dialects (e.g. Mārāvāṛi and Naipāli) the Conjunctive Participle ends in *r*. It seems to be a Passive form.

257. **Passive.** The Passive is formed in various ways. In the following, we have mere Prakritizations of the Sanskrit Present forms:—*ākālāti* (*ākalyatē*), II, 6a; *ubbhāvē* (*udbhāvyatē*, for *ubbhāvi*, m.c., § 231), III, 4; *diśīti* (*dṛṣyatē*), IX, 7; *pūjīti* (*pūryatē*), V, 7; VI, 4 (bis); *bhāvīti* (*bhāvayatē*), IV, 7; *sāpajjīti* (*sampadyatē*), XII, 2.

258. At other times we have a passive formed by adding, in Prakrit fashion, *ij* to the base, as in:—*jāñijīti* (*jñāyatē*), XII, 1; *pariśijīti* (*spṛṣyatē*¹), XII, 1; *rañijīti* (**rañijīyatē* for *rajyatē*), VIII, 5; *sandhijīti* (*samdhīyatē*), VIII, 5. In *pūjijīti* (*pūjyatē*), IX, 1, the explanation of the use of *ij* instead of *īj* is difficult. Possibly it is due to the influence of the *ū* in the first syllable, or possibly, the *ū* may represent *ū*. See §§ 24, 234, note, and 238. The meaning is vouched for by the Comm.

259. In § 234 I have referred to certain 3rd. Singular Presents ending in *-ūha* or *-ōha*. Possibly, as suggested in the preceding paragraph, we may here connect the word *pūjijīti* just mentioned. The examples of Passives given in § 234 are:—*anumūha* (*anumīyatē*), VII, 6; *thyōha* (*sthīyatē*), XII, 7; *pathyōha* (*prathyatē*), XII, 7; *taṣṣōha* (*tṣṣyatē*), VI, 3.

260. The only other Passive form noted is, perhaps, *vibhajīrō* (? = *vibhajya*), IV, 7, for which see § 256.

261. **Causal Verbs.** In the Present the Causal adds *ē* to the base. Examples of the 3rd. singular Present are:—*akamēya* (*ākramayati*), V, 5; *gāhēya* (*grāhayati*), V, 5; *pāvēya* (*prāpayati*), IV, 5; *bhākṣēya* (*bhākṣayati*), XI, 7. With the termination *-ēha* (see § 234), we have *bhāvēcha* (*bhāvayati*), V, 6 and *sāvēcha* (?) in the same verse. Regarding these, see § 234.

262. In § 233, I have quoted *vātēu* (XI, 8) and *bhāvēu* (XI, 9), and in § 248, *akamurēu* (XI, 2) (see also § 267, below). These are all causal forms, but whether the first two are Presents, and the third a Past, is doubtful. I am inclined to derive the first two from **vartayitaḥ*, **bhāvayitaḥ*.

263. For the 3rd. person plural of the Present, we have,—*avatārēna* (*avatārayanti*), X, 1; *ubbhāvēna* (*udbhāvayanti*), X, 3; *galāvēna* (*gālayanti*), VIII, 4; *cavvēna* (*carvayanti*), X, 4; *parāvēna* (*prāpayanti*), VIII, 4; *pāvēna* (id.), X, 3; *bhāvēna* (*bhāvayanti*), V, 2; *vāyēna* (*vādayanti*), V, 2. Regarding the difficulty of distinguishing these forms from the Instrumentals Singular, see §§ 169, 236.

264. For the Past Participle, we have *mārāvē* (*smāritāḥ*), XIV, 1.

¹ Cf. the remarks on *pariśīta* in § 251. The meaning here seems certainly to be *spṛṣyatē*. Cf. *sparkah* of Comm.

265. There are several instances of the Conjunctive Participle:—*kavalīta* (*kavalayitvā*, see § 255), VIII, 6; *takṣēta* (*takṣayitvā*), I, 3; *bhākṣēta* (*bhākṣayitvā*), I, 3; *bhāvēta* (*bhāvayitvā*), III, 8; VI, 3; VII, 1; *bhāṣēta* (*bhāṣayitvā*), XI, 3; *valīta* (*valayitvā*, see § 255), VIII, 6; *vajjēta* (*varjayitvā*), X, 5; XII, 5; *vaḍēta* (*vēṣṣayitvā*, see § 254), IV, 6.

266. For Passives of the Causal, we have *ubbhāvē* (*udbhāvyatē*), III, 4 (§ 231); and *bhāvi* (*bhāvyatē*), IV, 7.

267. In Mod. Ksh., a Causal is formed by adding *-ar*, as in ✓*kal-*, to be dumb, *kal^{ar}-*, to make dumb. This may account for the form *akamurēu* in XI, 2. It seems to be a Denominative Verb from *akamu* (*akramah*), out of order. The exact form is to me doubtful. It is probably a Causal Past Participle, but it may be a 3rd. singular Present. See §§ 233, 248, 262.

268. The following are therefore the principal conjugational forms noted in the MNP. :—

Present.

Sing. 1. *namasā* (*namasyāmi*) (§ 229).

3. *ākalati* (Ts.) (§ 230), *jayi* (*jayati*) (§ 231), *bhāya* (*bhāti*) (§ 232).

Plur. 3. *avatārēna* (see Causals), (§ 236).

Imperative.

Sing. 2. *bhaja* (Ts.) (§ 237), *paśśu* (*paśya*) (§ 237).

3. *viḥayūna* (? *viḥayatām*) (§ 238).

Plur. 2. *bhajīva* (*bhajata*) (§ 239).

Present Participle.

Masc. Plur. Nom. *piśandu* (*spṛśantaḥ*) (§ 243), *avataranda* (*avatarantaḥ*) (§ 243).

Fem. Sing. Nom. *gumūna* (= *gumagumāyamānā*) (§ 243).

Noun of Agency.

Masc. Plur. Nom. *vasavānē* (= *vasantaḥ*) (§ 245).

Fem. Sing. Nom. *bhajavāñi* (= *bhajanti*) (§ 245).

, , Instr. *uyavāñi* (= *udyatyā*) (§ 245).

Past Participle. *uditu* (*uditah*) (§ 247), *gata* (*gatam*) (§ 247), *gai* (*gataḥ*) (§ 248), *udiyō* (*uditah*) (§ 250).

Conjunctive Participle. *udayēta* (*uditya*) (§ 254).

Passive Voice.

Pres. Sing. 3. *diśsi* (*dṛśyatē*) (§ 257), *jāñji* (*jñāyatē*) (§ 258), *taḥpōha* (*tyḥpyatē*) (§ 259).

Causal Verb.

Pres. Sing. 3. *gāhēya* (*grāhayati*) (§ 261), *vātēu* (*vartayati*) (§ 262).

Plur. 3. *avatārēna* (*avatārayanti*) (§ 263).

Past Participle (Masc. Plur. Nom.), *mārāvē* (*smāritāḥ*) (§ 264).

Conjunctive Participle. *bhāvēta* (*bhāvayitvā*) (§ 265).

Passive of Causal.

Pres. Sing. 3. *bhāvi* (*bhāvyatē*) (§ 266).

INDECLINABLES.

269. The following are the principal **Adverbs** noted by me. Owing to rareness of occurrence, the exact meanings are sometimes doubtful. The Sanskrit equivalents are given, but this does not necessarily indicate derivation.

Adverbs of Place:—

utthē (= *tatraiva*), III, 5. Cf. *itha*, under Pronouns (§ 223).

tatyā (= *tataḥ*), VI, 2.

yatyā (= *yataḥ*), XI, 5.

The last two should perhaps be included under Pronouns.

270. **Adverbs of Manner** :—The equivalent of *iva* or *yathā* is *jana* (II, 2 ; III, 7 ; VIII, 5), which in Mod. Ksh. appears as *zan*. In IX, 5, it is written *jina*. The meaning of *janī* (? *janyēna*) (V, 4 ; X, 5 ; XIII, 3) is doubtful to me ; but, in V, 4, it seems to be equivalent to *jana*. See § 171.

271. For *yathā* and *tathā*, we have *yākhēta* (V, 1 ; IX, 6 ; X, 1 ; XI, 6) and *tākhēta* (IX, 6), respectively. Their derivation is obscure. From the form, we should take them as Conjunctive Participles. We may compare *tāvēta* (*tathāpi*) given below (§ 275). In IX, 5, *tā*, the Ablative of the Pronoun *tad*, is also used in the meaning of *tathā*. See § 221.

272. The Sanskrit *ēvam* > *ēva* in XII, 1 (see § 8).

The Sanskrit adverb *ēva* often appears as an enclitic, under the form *ē*, *yē*, or (with a weakened vowel) *ya*. Thus, *ṣīṭhu-ē* (*ṣīṭham-ēva*), IV, 2 ; *āpa-ē* (*ātmānam-ēva*), IV, 6 ; *tē-yē* (*ta-ēva*, nom. pl. m.), II, 6 ; *tē-vē* (*tad-ēva*), III, 8 ; *sō-yē* (*sa-ēva*), III, 9 ; (? *ta-ēva*), XI, 5 ; (*tad-ēva*), X, 3 ; *aku-ya* (*ēka-ēva*), V, 7 ; *caura-ya* (*catvāri-ēva*), VII, 8 ; (*catasṣḥir-ēva*), X, 5 ; *aṣṭi-ya* (*aṣṭābhir-ēva*), IX, 3 ; *ēhu-ya* (*ēṣa ēva*), II, 6a ; *tē-ya* (*tad-ēva*), XI, 5 ; *ṣaṅcadahē-ya* (*ṣaṅcadasabhir-ēva*), XI, 7 ; *ṣaraṣu-ya* (*ṣparaṣa-ēva*), XII, 1.

In one case, it becomes *i*, in *mahāthu-i* (*mahārtha ēva*), IV, 7. Further contracted forms are *akkai* (*ēkā-ēva*), I, 4 ; IX, 1 ; X, 7 ; XI, 6 ; and *utthē* (*tatraiva*), III, 5.

In II, 4, the printed edition gives *nānu-cē* (*jñānam-ēva*), in which *cē* would correspond to the Prakrit *ccēa* (< *catva*). But it may be an error, for my MS. gives *nānu-ya*.

273. The ordinary negative is *na*, as in IV, 7. In II, 3, the word *mā* is employed as a simple negative, and, in this case, not with the Imperative.

274. **Conjunctions**. The Mod. Ksh. word for “and” is *ta* (= Av. Skt. *uta*), but I have not certainly identified any case of the occurrence of a word with this meaning in our text. In Mod. Ksh. *ti* is used to mean “and” between plural nouns, and also in the sense of the Sanskrit *api*. So, here, we have *avayava ti* (*avayavō 'pi*), II, 69 ; *ti¹ tatha* (*api tasmin*), III, 6 ; *guru ti* (*gurur api*), V, 6 ; *śivā ti* (*śivā + api*), XI, 1. The origin of this word is obscure. I would suggest *iti* as a possibility.

275. Other Conjunctions noted are :—

¹ Note that *ti* here begins a clause.

Sanskrit *api* appears in *parasyau* (*parasyāḥ + api*), II, 1 (§ 181); *va* (*vā*), IX, 6; *yida* (*yadi*), twice in V, 6, *pida* of the printed edition being a misprint.

tāvēta (*tathāpi*), IX, 2. Cf. *tākhēta* and *yākhēta* in § 271. Like these, the word looks like a Conjunctive Participle, but it may be a compound (*tāvē-ta*).

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THE PALÆOGRAPHY OF THE HATHIGUMPHA AND
THE NANAGHAT INSCRIPTIONS

BY

R. D. BANERJI, M.A.,
Benares Hindu University



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By R. D. BANERJI, M.A.
Benares Hindu University.

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THE PALÆOGRAPHY OF THE HATHIGUMPHA AND THE NANAGHAT INSCRIPTIONS.

By R. D. BANERJI, M.A.
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In the first volume of the Memoirs of the Archaeological Survey, Rai Bahadur Ramaprasad Chanda, who has analysed the letters of the votive inscriptions discovered on the railing of the *stūpas* at Sanchi for the first time, arranged Indian Brāhmi inscriptions, from the third century B.C. to the second century A.D., in the following order :—

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(b) Inscriptions on the railings of Stūpa No. II at Sanchi.
(c) Bharut railing inscription.
(d) Inscriptions on the remnants of the old Bodhgaya railing.
- (5) (a) Besnagar Garuḍa pillar inscription of the year XII after the installation of Mahārāja Bhāgavata.
(b) Inscription of Nāyanikā, widow of the Andhra King Śatakarṇi I in the Nanaghat Cave.
(c) Bharut *torāṇa* (Gate) inscription.
- (6) Hathigumpha Inscription of Khāravela, King of Kalinga.
- (7) Sanchi *Toraṇa* inscriptions.
- (8) Inscriptions of the time of Śoḍāsa.
- (9) Inscriptions of the time of Kaṇishka.¹

In 1919, the author was deputed by the Government of Bombay to assist Mr. K. P. Jayaswal, Bar.-at-law, then Honorary Secretary of the Bihar and Orissa Research Society, in taking fresh impressions of the Hathigumpha inscription, when a third fresh impression of this important inscription was taken. This new impression was very helpful in the study of the forms of letters used in this important inscription, as the impression reproduced in the Journal of the Bihar and Orissa Research Society with Mr. K. P. Jayaswal's first reading of this record² is not very distinct and therefore cannot be used for an accurate palaeographical analysis. No attempt appears to have been made to study the forms of letters used in the Hathi-

¹ *Memoirs of the Archaeological Survey of India, No. 1, pp. 15-16.*

² *Journal of the Bihar and Orissa Research Society, Vol. III, pp. 425-72.*

gumpha Inscription since the publication of Bühler's monumental work on Indian Palaeography and in the absence of such data, the inscription has been placed by various people in various strata of Indian chronology. An analysis of the forms of different letters of the alphabet used in the Hathigumpha Inscription of Khāravela is therefore necessary to determine its proper position in the chronological scale.

I. HATHIGUMPHA INSCRIPTION.

A. VOWELS.

Beginning with the vowels, one finds that the form of *a* used in this inscription is that in which the two curves, forming the left side of the letter, do not touch each other at the point, where they join the vertical straight line on the right; *cf. anugaha anekāni* (1.7), *acitayitā* (1.4) *ahata*¹ (1.5). The initial form of *ā* is not to be found in this record but the medial form is generally denoted by a short, vertical, perfectly straight stroke to the right, as in the Maurya alphabet. The later form of the medial *ā* also is to be found in certain cases; *cf. thā* in *paṭisamthāpanam* (1.3). The initial form of *i* is not clear and distinct in this inscription but in the medial forms we notice certain changes. In the first instance, the ordinary form of medial *i*, used in this record, is the form with which we are familiar in earlier and later Maurya inscriptions; but certain later forms have also been used side by side. These later forms are indicated by a disparity in the size of the vertical and the horizontal lines, which are equal in length in Mauryan inscriptions and also by the softening of the right angle into a curve; while in certain cases these two straight lines join to become a slightly curved line. The older forms are to be noticed in the first five or six lines; *cf. siri* (1.4). The disparity in size may be observed in *hi* after *samdasanā* (1.5) as well as *nagarim* in the same line. The softening of the angle into a curve is noticeable almost everywhere; *cf. paṭisamkhārayati* (1.3). The degeneration of the right angle into a slightly curved line is noticeable in the last line of the inscription; *cf. ni* in *vāhini* (1.17). The initial long *ī* is also absent in this inscription. The original medial form as used in the Maurya alphabet consists of a short straight horizontal line from the right end of which another straight line rises at right angles to the base line; while a second vertical straight line rises from the base line, parallel to and to the left of the first vertical line. This form is rare in this inscription. The first change in it is the softening of the right angles. This we find in *Kumāri* (1.14). Later changes are the divergence between the vertical lines which stand on the base line thus forming acute and obtuse angles with the latter, instead of right angles; *cf. rī* in *sarira* (1.2). In the next form, there are two vertical lines at two ends of the base line none of which are at right angles, *cf. kī* in *kūdikā* (1.2). The latest development is the suppression of the base line as in *bī* in *catubīsati* (1.2). The initial form of *u* is to be found *usava* (1.5) and *upapīdāpayanti* (1.8) but in these initial forms as well as in the medial forms there is no deviation from the ancient Maurya

¹ The text used is the distinct portion of and the lines in this text refer to Mr. K. P. Jayaswal's article in the *Journal of the Bihar and Orissa Research Society*, Vol. IV, pp. 397-403

form; cf. *Kumārī* (1.14). The long *ū* is to be found in its medial form only as in *rūpa* (1.2). The initial form of *e* is to be found in *etinā* (1.8), where the form is similar to that of *dha*, as two of the lines of the triangular forms have coalesced into a curve. Among the vowels the only other initial forms which remains to be noticed are *ai* and *o*. The very rare *ai* is to be found in *Airena* (1. 1). The initial form of *o* is to be found in *oghātītām* (1.6) where there is no difference from the older Maurya form.

B. CONSONANTS.

Among the consonants *ka* is cruciform in shape, in which the length of the vertical line, below the point of its junction with the horizontal line, is greater than its length above that line; cf. *Kalīngādhipatinā* (1.1) and *kārayati* (1.4). Two different forms of *kha* have been used in this inscription. We find that the first form is that in which there is a regular circle or sphere in the lower part of this letter. There is a triangle at the end of the vertical line instead of the circle, in the form used in *Khāravaleṇa* (1.1) and the circle or sphere in *Khāravale* (1.17). Another form is without any appendage in its lower part; cf. *lekha* (1.2) and *nikhita* (1.5). Many different forms of *ga* have been used. The oldest of them, no doubt, is that in which there is an angle at the top, though the sides are slightly curved, cf. *nagarīm* (1.5). The second form is the round broad-backed one, cf. *Gaṃdhava* and *gīta* (1.5), *gopura* (1.3). There are many sub-varieties among the later forms, which depend entirely upon the extent of divergence of the two limbs of the letter. Three different forms of *gha* have been used side by side in this inscription. The older Maurya form, in which the lower part of the latter is yet curved, is to be found in *ghātāpayitā* (1.8). The transitional form in which the curve is modified by being slightly angularised is to be found in *oghātītām* (1.6), where the left limb of the curve has become a right angle, while the right end remains a perfect curve. The latest form is to be found in *megha* (1.1), where the curve has disappeared giving place to two right angles.

The form of *ca* is that of the earlier inscriptions and consists of a vertical straight line to the lower part of which is attached a semi-circle, on the left side of it. Three clear cases of *cha* are to be met with *pachima* (1.4), *achariyam* (1.13), and *vochine* (1.16) and in all of these three cases the form used is the older Mauryan form, in which two perfect semi-circles are attached to the bottom of a short vertical straight line, one on each side of it. Three different forms of *ja* have been used. The older form is to be found in the majority of cases and in this form the angularisation of curves is not yet noticeable. This we find in *Vijā* (1.2), *yovarajam* (1.2). Side by side with this form, the transitional form is to be found in a few cases where we notice the partial angularisation of the curves, as in *visajati* (1.7). The later angularised form is to be noticed in one or two cases; cf. *rāja* in *Ceti-rāja* (1.1), where in spite of the angularisation of the curves, the left end of the letter has not become a straight line as in later Kuṣāṇa forms. *Jha* does not occur.

The form of *ṭa* is that of a vertical semi-circle as in the Maurya alphabet cf. *makūṭa* (1.5) *oghātītām* and *vātā* (1.6). So also is the case of *tha*, which is a complete

circle : cf. *Rathika* (1.1) and *pathāpayati* (1.14). *Da* also has the old form e.g., *kaḍāra* (1.2) and *Pāḍarāja* (1.13). *Dha* occurs in (1.5) according to Mr. Jayaswal,¹ but this letter is not at all clear in the impressions and is, therefore, being left out. There is no difference in the form of *na* used in this inscription and the Maurya form, where the horizontal lines at the top and bottom of the letter are perfectly straight and parallel, has been used in all cases.

Three different forms of *ta* have been used, two of which are older forms ; in the first one of which the lower part of the letter is a semi-circle and this form is to be found in the majority of cases ; cf. *arāhātānam* (1.1) and *tato* (1.2). In the second one, the place of the curve is taken by two different tangential strokes from the lower end of the vertical straight line ; cf. *hita* (1.6). The third form is the later one to be found in the inscriptions in Cave No. X at Nasik,² where the vertical straight line does not stand exactly on the centre of the lower part of the letter, but partly to the left. This form is to be seen in *Ceti* (1.1) and *avadātēna* (1.2). There is no change in *tha*, which is a perfect circle with a point in its centre ; cf. *civuthe* (1.4). Two forms of *da* have been used ; (1) in which there is no angularisation of the curve in the middle of the letter, cf. *paṁdarasa* and (2) in which the curve in the middle of the letter has become angularised, cf. *paṁādena* (1.9). So also in the case of *dha* two forms are to be found. In the first form, the letter consists of a vertical straight line to the right and a semi-circle or a large segment of a circle to the left, both ends of which meet both ends of the straight line ; cf. *Kalimḡādhīpatinā* (1.1), *paḍhame* (1.3), and *vidhi* (1.2). In all of these forms, the angles formed by the curve with this line are equal both at the top and the bottom. In the other form, the angle at the bottom is smaller than that at the top ; cf. *Vijādhara* (1.5), *Madhurām* (1.8). There is no change in *na*, the base line of which is perfectly straight.

Four different forms of *pa* are to be found in this inscription : (1) The first of them is the ancient Maurya form in which the lower part of the letter is a perfect curve. There are two instances of this form ; the first *pa* in *pathāpayati* (1.4) and *Utarāpaḍha* (1.11). (2) Next comes the transitional form in which one side of the curve becomes rectangular while the other side remains curved ; cf. *paṁdarasa* (1.2), and *kārāpaṇā* (1.5). (3) Last of all, comes the later form in which the lower part consists of two right angles instead of a perfect curve ; cf. *Kalimḡādhīpatinā* (1.1), the second *pa* in *pathāpayati* (1.4) and *apayāto* (1.8). The fourth form is the early *Kṣatrapa* or *Kuṣāna* form, in which though the right angle appears, both vertical arms of the letter are almost equal in height ; cf. *Kaḍarukho* (1.9). In this inscription, however, only the first three forms are to be found in large numbers. *Pha* does not occur at all and *ba* is almost a perfect square in shape ; cf. *bahula* (1.4), *budho* (1.5). In *bha*, in the majority of cases, the length of both straight lines in the lower part of the letter is not the same. The majority of cases show the later form, with the exception of *Bhojake* (1.6), where both of the lower limbs are of equal length ; cf.

¹ *Ibid.*, Vol. IV, p. 398.

² *Epi. Ind.*, Vol. VIII, pp. 78-80 : Nos. 10-14a.

abhisitamato (1.3). In all cases, however, the right arm of the letter consists of a single line and not three as in the case of the older Maurya form. Two different forms of *ma* are noticeable. One is the older form in which the lower part of the letter consists of a circle and the upper part of two well-rounded curves. This form is to be found in the majority of cases; *cf.* *Mahāmeghavāhanena* (1.1), *Kumāra* (1.2), and *pachima* (1.4). The other form is the transitional form between the Maurya and the Kuṣaṇa ones, in which the lower part of the letter consists of a triangle while the upper part consists of two curves; *cf.* *namo* (1.1), *Mahārājābhisecanam* (1.3) and *satamam* (1.7).

There are two different forms of *ya* in the Maurya alphabet, both of which have been used in the Hathigumpha inscription. In one of these forms, the lower part of the letter consists of a single curve; *cf.* *Yo Venābhivijayo* (1.2), while in the other it consists of two different curves, *cf.* *haya* (1.4). Both forms have been used side by side in this inscription. *Ra* consists of a straight line which does not end in a series of curves, styled "the corkscrew pattern" by Rai Bahadur Ramaprasad Chanda.¹ Three forms of *la* are to be seen; *e.g.*, (1) the older Maurya form or the form in which the lower part of the letter is a perfect curve and the right arm is higher than the left; *cf.* *lekha* (1.2) and *tālam* (1.3). The second form is slightly later in date, in which, though the lower part is still curved, the height of the right vertical line has diminished; *cf.* *bahulam* (1.4), and *Kalimga* (1.3). In the third form, though the height of the vertical line on the right is greater than that of the left limb of the letter, the lower part has become rectangular, *cf.* *Kalimga*, (1.3), *Tanasuliya* (1.6), *paṭālako* (1.16) and *Khāravela* (1.17). There are two different forms of *va*, the first of which is the older Maurya form, in which the lower part of the letter is round or circular; *cf.* the first *va* in *vavahāra* (1.2) as well as that in *supavata* (1.14). The other form is the later form, in which the lower part of the letter consists of a triangle. This form has been used in the majority of cases in this inscription; *cf.* *sava* (1.1), *vidhi* (1.2), *vāta* (1.3), and *vase* (1.4).

The only instance of the palatal *sa* in this inscription is to be found in the last line, in the word *Viniṣṛito*, which has been read correctly by Mr. Jayaswal for the first time, all previous scholars having read *vinigato*. The subscript *r* is denoted by an additional horizontal stroke attached to the lower end of the right limb. The lingual *ṣa* does not occur, but there are three varieties of the dental *sa*; (1) the Mauryan form as in *Sidhānam* (1.1), (2) later Maurya form as in *sava* (1.1), and (3) the Early Kuṣaṇa form as in *Civuthe vase* (1.5). Among these, however, the first two have been used in the majority of cases. Similarly, three different forms of *ha* have been used side by side, in this inscription, as in the case of *la*. The older form is that in which the lower part is curved but the height of the left vertical line is greater than that of the right limb; *cf.* *Mahārājābhisecanam* and *vihata* (1.3). In the transitional forms, the lower part is slightly angularised or the height of the left limb is reduced. In the former sub-variety can be placed *Mahārāja* and *Mahāmeghavāhana* (1.1). The reduction of

¹ *Memoirs of the Archaeological Survey of India : No. 1, p. 5.*

the height of the left limb is to be noticed in *haya* and *bahulam* (1.4). The angular form of the letter is to be found in *vavahāra* (1.2), *bhimgārehi* (1.6).

II. THE NANAGHAT INSCRIPTIONS.

A comparatively small number of letters have been used in the Nanaghat inscription. Of vowels, the initial forms used are those of *a* and *i*. Among constants *gha*, *na*, *jha*, *ḍa*, *ḍha*, *ṇa*, and *pha* as well as the palatal and lingual sibilants have not been used at all.

A. VOWELS.

Among vowels, the form of *a* used consists of a straight vertical line on the right, to the middle of which is attached two slanting or tangential lines, one going towards the top and the other towards the bottom, both on the left side, *cf. apratihata* (1.2), *Aṃgiya* (1.3), *agādheya* (1.6). The only exception is *Asamedho* (B.1.1). The inscription has suffered much since the publication of the first facsimile in 1883.¹ Whatever portions of it remained undamaged show that no other form of *a* has been used. The initial form of *i* has been used only once in the invocation to Indra in line 1 (*Imdasa namo*).

B. CONSONANTS.

Only one form of *ka* is to be found, which is a regular Latin cross in shape, in which the horizontal straight line is shorter in length than the vertical and the portion of the vertical line below the horizontal line is longer than the portion above the horizontal line, *cf. Samkamsana* (1.1) and *Cakasa* (1.2).

The form of *kha* used does not show any circle or triangle at the bottom of the straight line, which forms its right limb; *cf. Dakkhināpatha* (1.2) but in this word the form of the letter is not very clear. There are two other clear instances, one of which is *dikha* (1.5) and the other *dakkhinā* (1.6); while in the second part of the inscription the letter is to be found several times in the word *dakkhinā*.² Several forms of *ga* are to be found in this inscription. The most common form is the broad one, in which the curve in the upper part of the letter is almost a straight line and not a curve; *cf. Aṃgiya* (1.3). Another form is the Maurya form, in which the angle at the top has not given way to the curve; *cf. agādheya* (1.6). A more clear instance is to be found in *ānāga* (1.5) and *Sāgara* (1.3). The earlier form is to be found in *giri* (1.3) as well as in *gaha* (1.5); *gha* and *ṇa* do not occur in this inscription.

In the next *varga*, *ca* consists of a vertical straight line on the right and a semi-circle on the left which is attached to the foot of the vertical straight line on its left side; *cf. Camda*. A slightly modified form is to be found in (1.4) in the word *Cakasa* where the letter resembles the letter *va* of the Kuṣaṇa period and consists of a short vertical straight line at the bottom of which is a modified triangle, the angles of which have turned into curves. *Cha* occurs only once, in 1.7 of the second part of the large inscription in the word *chavasa*. Here the form of the letter consists of a

¹ Reports of the Archaeological Survey of Western India, Vol. V; Report on the Etura Caves and the Brahmanical and Jaina caves in Western India, London, 1883, pl., L1, 1 and 2.

² *Ibid.*, pp. 60-61.

vertical straight line the lower part of which acts as the diameter of a circle. *Ja* is rather rare. It is to be found in the last line of the first part of the big inscription in the word *Rāja*, which has been correctly restored as *Rājasuya*. Here, the form is that of the English letter E without the angles, or rather it consists of two semi-circles placed one above the other, both of which are open towards the right. *Jha* does not occur but *ña* occurs several times in the word *yamña* or *yaña*. The form consists of a short vertical stroke at the top, attached to the right end of which is a straight line. To the right of this straight line, and joining it at its middle, is another horizontal straight line, at the end of which is another vertical straight line, going down. In the forms which are legible in this inscription, all vertical lines form right angles with all horizontal lines which they meet; cf. *Yamña* (1.6).

Ta consists of a semi-circle open to the right; cf. *paṭā* (B.11.4-5). *Tha* is more common as in the word *Yiṭha*. It consists of a plain circle; cf. *Yiṭho* in 1.1 of the second part of the large inscription. *Da*, *dha*, and *na* do not occur in this inscription. *Ta* generally consists of a curve hanging to the lower end of a vertical straight line; cf. *vrata* (1.5). In certain cases, the upper vertical line is not attached exactly to the middle of the curve, cf. *apratihata*, where both forms are of this type. An older Maurya form is to be found in *mahimāvatānam* (1.1), where instead of the curve there are two tangential strokes, dropping down from the bottom of the vertical straight line. *Tha* consists of a complete circle with its centre marked by a dot; cf. *asaratha* (B.1.1). *Dha* consists of two different types. In the first type, the letter consists of a vertical straight line to the left of which and attached to its ends is a semi-circle. In the other type, the semi-circle decreases in size to an arc of a circle which is smaller than a semi-circle, and in which the angle at the bottom is often smaller than that at the top; cf. *vadhanasa* (1.3), *dhanadasa* (1.4). In *da*, no angle is to be found in the middle, where instead of it a well-defined semi-circle is to be seen; cf. *Imdasa* and *camda* (1.1). In the second part of the inscription, *da* occurs in the words *dakḥinā* and *dinā* several times but no angle is visible. The forms, however, are not so regularly formed as in the first part; cf. the form of this letter in the word *dakḥinā* in the first part of 1.6. *Na* consists of a perfectly straight horizontal base line and standing at right angles to it, a vertical straight line, which are almost equal in length. The lengths of the horizontal and vertical straight lines, however, vary in certain cases; cf. the form used in the first word *kāhāpanā* in 1.10.

Many different forms of *pa* are to be seen in this inscription. The older Maurya form is to be found in 1.4 of the second part of the big inscription. The later Maurya form, in which the vertical line has decreased in height, is to be found in *masopavasiṃya* (1.5). The next later form in which the curves have turned into straight angles is to be found in *apratihata* (1.2) and *putradasa* (1.4). The last mentioned form appears to be the usual one as it occurs more frequently than others. *Pha* does not occur and *ba* occurs only twice; cf. the word *brahmachariyāya* (1.5) and *bitiyo* in B. 1.1. In both of these cases the form of the letter is that of the regular square. But in *bitiyo* the upper line of the square is not straight; *bha* occur once in the word *bhariya*

in 1.4 of part A. It occurs once more in the second part, in the word *bhagala* in B. 1.4, but in this case the form is very indistinct and therefore it is not reproduced. In the word *bharyā*, the form of *bha* used, consists of a vertical straight line on the right, from the middle of which there is another horizontal straight line at right angles to it, on the left. From the left end of this horizontal straight line another vertical straight line drops at right angles downwards, the form thus differing from that of the older or Maurya alphabet. The letter *ma* consists of a circle at the bottom and two curved lines, the top of it. This form is a very near approach to the Maurya form of this letter. The early Kuṣaṇa form is also used; cf. *asamedho*, (B.1.1).

Only one form of *Ya* has been used. This is the anchor-shaped form, in which there is a semi-circle or arc of a circle in the lower part, which is open towards the top. From the centre of this arc a vertical straight line rises at right angles. *Ra* consists of a perfectly straight vertical line. The form of *la* used in the majority of cases, is of the old Maurya type in which the straight line in the right half of the letter is still higher than the left limb; cf. *bālāya* and *kula* in 1.3, and *rupālamkāro* in 1.1 of part B. The other form appears to be southern. It is to be found in *balayāya* (1.3) and *vasalaṭhi* (1.8). This second form appears to have been evolved out of the peculiar form of *la* used in certain cases in the Bhaṭṭiprolu inscriptions; cf. the form of this constant in *kelo* in 1.5 of the inscription on the lid of the third casket discovered at this place.¹ Two different forms of *va* are to be found, the earlier one, which consists of a vertical straight line on the top and a sphere or circle attached to the lower part of this line, is to be found in *vadhanasa* (1.3). The later form in which the sphere or circle is changed into a triangle is to be found in *Vāsudevānam* (1.1), also *devasa* (1.4).

The palatal and medial sibilants have not been used in this inscription, but we find several different forms of the dental sibilant. The Maurya form of the dental sibilant has not been used in a single instance in this inscription. In the majority of cases, the vertical lines of both limbs of this letter are almost equal; cf. *Dhammasa* and *Imdasa* in 1.1. In certain cases, the difference between the right and left limbs has increased and the latter has assumed the form with which we are familiar in Kuṣaṇa inscriptions; cf. *Kumāravarasa* and *Vedisirisa* (1.1), *sūrasa* and *cakasa* (1.2), *vadhanasa* and *Sāgara* (1.3), and this is certainly the type-specimen of the dental sibilant used in this inscription. In the case of the aspirate, the Maurya form is to be found in *Mahāraṭhino* (1.3), *apratihato* (1.2), and *gaha* (1.5). The second form, however, is observable in the word *kāhāpana*, both in the first and the second part of the inscription, in which the height of the left vertical line is certainly much less.

III. THE COMPARISON.

We are now in a position to institute a comparison between the forms of the letters used in the Nanaghat and the Hathigumpha inscriptions. It has generally been supposed that the Nanaghat inscription is much earlier than the Hathigumpha

¹ *Epi. Ind.*, Vol. II, p. 328, No. VIII.

inscription. This mistaken view is entirely due to the faulty facsimile published by Bühler in 1883, after which date no other facsimile has been published nor do we know of any attempt to secure and publish a more accurate reproduction of this important record.

A. VOWELS.

The only vowel, the initial form of which has been used in both inscriptions, is *a*. On comparing three specimens from each inscriptions it is to be noticed that the form used in the Hathigumpha inscription in (1) *acitayitā* (l. 4), (2) *ahata* (l. 5), and (3) *anugaha* and *anekāni* (l. 7) is certainly later than the form used in the Nanaghat inscription in three cases (1) *apratihata* (l. 3), (2) *Aṃgiya* (l. 3), and *agādheya* (l. 6); but is the same as that used in *Asamedho* in B.I.I of the latter record. The general softening of the angle in the medial forms of the short and long *i*, which is to be found in the Hathigumpha inscription is rarely found in the Nanaghat records.

B. CONSONANTS.

Among consonants, the form of *ka* used in the majority of cases, in both inscriptions, is perfectly identical. This form shows greater length in the second or lower portion of the vertical straight line, which is below the horizontal line, compared with the part of it above that line. In the Hathigumpha inscription, the form used in *Kalimṅādhipatinā* (l. 1) and *kārayati* (l. 4) is exactly similar to that used in *Samkamsanasa* (l. 1) and *cakasa* (l. 2) of the Nanaghat inscription. Two forms of *kha* have been used in the Hathigumpha inscription but only one form has been used in the Nanaghat record. In the second form, used in the Hathigumpha inscription, which has also been used in the Nanaghat inscription, there is no pendant hanging from the bottom of the vertical line and therefore there is no indication in this letter which can enable one to determine the age of this consonant by a comparison. A number of varieties are to be noticed in *ga* in both inscriptions. Thus the oldest or the Maurya form is to be found in *nagarim* (l. 5) of the Hathigumpha inscription and in *giri* (l. 3) and *gaha* (l. 5) of the Nanaghat inscriptions. The next form is that in which the angle at the top of the letter is retained but the sides are curved; cf. *agādheya* (l. 6) of the Nanaghat inscriptions. The later broad-backed form, in which the angle at the top of the letter gives way to a curve, is to be seen in both inscriptions; cf. *Aṃgiya* (l. 3) of the Nanaghat inscriptions and *Goṇpura* (l. 3), *Gaṃdhava*, and *gūla* (l. 5) of the Hathigumpha inscription. *Gha* does not occur in the Nanaghat inscription, but it should be noted in this connection that the Hathigumpha inscription shows at least three different varieties of this consonant and in this record, the early Maurya form has been used side by side with the early Kuṣāṇa form, in which the curve at the bottom has turned into two right angles. In both inscriptions, the form of *ca* used is that of the earlier inscriptions of the Maurya period; cf. *catubisati* (l. 2), *paṃcama* (l. 6) in the Hathigumpha inscription and *Caṃda* (l. 1), *cakasa* (l. 2), *carita* (l. 5) in the Nanaghat inscription. *Cha* occurs at least four times in the Hathigumpha inscription, but is to be found only once in the Nanaghat inscription. In the latter case, the form is that of a vertical straight line, the lower end of which bisects or acts

as a diameter of a circle. But the Hathigumpha inscription shows the use of "the butterfly type" of Rai Bahadur Ramaprasad Chanda¹; cf. *pachima* (l. 4), *chata* (l. 5), *achariyam* (l. 13), and *vochine* (l. 16). In the Nanaghat inscription please see the forms in *cha-vase* (B.1. 7) and *chando* (l. 6). *Ja* also is very rare in the Nanaghat inscription while it is quite common in the Hathigumpha record. In the Nanaghat inscription it is to be found only once; in A. 1. 10 in the word *Rājasuya*. Here, the form of the letter is that of the old English letter E, in which right angles have taken place of the curves. This form has also been used in the majority of cases in the Hathigumpha inscription; cf. (I) *Vijā* (l. 2), *Yovarajam* (l. 20), *gaja* (l. 4); but in this record transitional as well as later forms are also to be found. The transitional form is that in which angularisation of the curves has taken place to a certain extent; cf. *visajati* (l. 7) and the more finished form of the first century B.C., or the early Kuṣaṇa form² in which all curves have given place to angles. In this form, the letter has the appearance of the Roman letter E and it is to be found in one or two cases only; cf. *Cetirāja* (l. 1). *Jha* does not occur in any of these inscriptions, while *ña* to be found in the Nanaghat inscription is of no use for purposes of comparison.

The form of *ṭa* in both inscriptions is the same; cf. *makuta* (l. 5), *oghātītam*, and *vātā* (l. 6) of the Hathigumpha inscription and *patā* (B. II. 4-5) of the Nanaghat inscription. *Tha* also is exactly similar in both inscriptions; cf. *luṭhita* (l. 1) and *pathāpayati* (l. 4) of the Hathigumpha inscriptions and the word *yīṭha* in various parts of the Nanaghat records, (B. II. 1, 4-6). *Da*, *dha*, and *na* do not occur in the Nanaghat inscription, and though they occur in the Hathigumpha inscription, no comparison can be instituted. It should be noticed in this connection that both the base and top lines of *na* are perfectly straight in the latter record; cf. *gaṇanā* (l. 2), proving that the Kuṣaṇa form of this consonant had not come into use at that time in Orissa.

The older form of *ta* has been used in the majority of cases in both inscription; cf. *vrata* (l. 5) of the Nanaghat inscription and *arāhātānam* (l. 1) and *tato* (l. 2) of the Hathigumpha inscription. The other form in which the place of the curve in the lower part of the inscription is taken by two tangential straight strokes is also to be found in both records; cf. *mahimāvatānam* (l. 1) of the Nanaghat record and *hita* (l. 6) of the Hathigumpha record. A third form also occurs in both inscriptions, in which the vertical straight line in the upper part of the letter is not placed exactly in the middle of the curve in its lower part, but is on one side; cf. *Ceti* (l. 1) and *avadātēna* (l. 2) of the Hathigumpha record and *apratihata* (l. 2) of the Nanaghat inscription. The form of *tha* in both inscriptions is exactly the same, cf. *civuthe* (l. 5) of the Hathigumpha inscription and *Asaratha* (l. 1) of the second part of the Nanaghat inscription. Only one form of *du* is used in the Nanaghat inscription where no angle is to be found in the curve in the middle of the letter; cf. *Imdasa* and *Camda* (l. 1); but in the second part of the inscription, there is at least one instance in which this curve at the back is not regularly formed; cf. *Dakhinā* in the first half of B. 1. 6. Compared with this, at least two different forms are used in the Hathigumpha inscrip-

¹ *Memoirs of the Arch. Survey of India*, No. 1, p. 5.

² *Epi. Ind.*, Vol. VIII, p. 175

tion. The first or oldest is the Maurya form in which the curve in the middle of the letter is well formed; *cf. pāmdarasa* (1. 2). The other form shows this curve to have become angularised, as in *paṇādena* (1. 9). Both inscriptions show two different forms of *dha*. The older form is that in which the left limb of the letter consists of a complete semi-circle; *cf. Dhammasa* of the Nanaghat inscriptions and *paḍhame* (1. 3) and *vidhi* (1. 2) of the Hathigumpha inscription. The later form is that in which the left limb is smaller than a semi-circle; *cf. vadhanasa* (1. 3) and *dhanadusa* (1. 4) of the Nanaghat inscriptions and *Vijādhara* (1. 3) as well as *Madhuram* (1. 8) of the Hathigumpha inscription. In both inscriptions the form of *na* is similar, the base line being perfectly straight.

At least three different forms of *pa* have been used in the Nanaghat inscriptions and four in the Hathigumpha inscription. The earlier or Maurya form of this letter occurs in both inscriptions; *cf. Lokapālānam* (1. 1) of the Nanaghat inscriptions and *paṭhāpayati* (1. 4) as well as *Utarāpadha* (1. 11) of the Hathigumpha inscription. The Nanaghat inscriptions show the use of a peculiar transitional form, in which though the lower part of the letter remains curved, the height of the left vertical line decreases very much, making both ends of the curve level; *cf. masopavasiniya* (1. 5). Another transitional form is to be found in the Hathigumpha inscription in which one side of the curve becomes rectangular while the other side remains curved; *cf. pāmdarasa* (1. 2) and *kārāpaṇā* (1. 5). The next later form, in which the curve at the bottom of this letter is turned into two right angles; is the most common form in both inscriptions; *cf. apratihata* (1. 2) and *putradasa* (1. 4) of the Nanaghat inscription as well as *Kalīṅgādhīpatinā* (1. 1), the second *pa* in *paṭhāpayati* (1. 4) and *apayāto* (1. 8) of the Hathigumpha inscription. The Hathigumpha inscription shows a still later form, in which the lower part is rectangular, but both verticals are equal in length; *cf. Kaparukho* (1. 9). *Pha* does not occur in any of these inscriptions and the form of *ba* is almost a perfect square in both inscriptions; *cf. Bahula* (1. 4) and *Budha* (1. 5) of the Hathigumpha inscription and *brahmacariyāya* (A. 1. 5) and *bitiyo* (B. 1. 1) of the Nanaghat inscription. It should be noticed that the upper line of the square in *bitiyo* is curved and so is one side in *bahula* of the Hathigumpha inscription. There is some difference in the form *bha* used in both of these inscriptions; *cf. Bhariyā* (1. 4) of the Nanaghat inscription and *mahārājābhisecanam* (1. 3) of the Hathigumpha inscription. In the latter inscription, the later form of this letter is to be found in the majority of cases, in which the lower ends of the two vertical straight lines are not equal in length; *cf. abhisitamato* (1. 3). Instances of irregularly formed *bha* are also to be met with in the Nanaghat inscription; *cf. kubhiyo* (1. 8). Only one form of *ma* is used in the Nanaghat inscription; *cf. Dhammasa* (1. 1), while three different forms are to be noticed in the Hathigumpha inscription. The most common form is the older Maurya one, with which there is very little difference between the form used in the Nanaghat inscription; *cf. pachima* (1. 3). The second form is the transitional form; *cf. namo* (1. 1) and *satamam* (1. 7).

Only one form of *ya* has been used in the Nanaghat inscription; *cf. agādheya* (1. 6) while two different forms have been used in the Hathigumpha inscription; *cf.*

Yo Venābhivijayo (1.2) in which the lower part consists of a single curve and *haya* (1.4) in which the lower part consists of two distinct curves. In the first form of this letter, there is no difference in any of these two inscriptions. So, also, *Ra* consists of a straight line in both inscriptions. Three different forms of *la* have been used in each of these two inscriptions. Among these three the first two are common to both. In these two forms, the first is that of Maurya inscriptions in which the height of the right limb has not decreased in size; cf. *bālāya* and *kula* (1.3) of the Nanaghat inscriptions and *lekha* (1.2) as well as *tālam* (1.3) of the Hathigumpha inscription. The second form is that in which the height of the right limb has perceptibly decreased; cf. the second *la* of *lokapālānam* (1.1) of the Nanaghat inscription. With this please compare the form of this letter in *bahulam* (1.4) and *Kalimṅga* (1.3) of the Hathigumpha inscription. In addition to these forms the Nanaghat inscriptions show the use of a peculiarly southern form in which the base line is suppressed; cf. *valayāya* (1.3), a specimen which is not very distinct, and *vasalathi* (1.8).¹ The Hathigumpha inscription shows the use of that later form in which the curve at the bottom of the letter has become two right angles; cf. *Kalimṅgarāja* (1.3), *Tanasuliya* (1.6), *paṭālaho* (1.16), and *Khāravella* (1.17)². Both inscriptions show the use of two different forms of *va*. In the Nanaghat inscriptions the earlier form is to be seen in *vadhanasa* (1.3). In the Hathigumpha inscription the first instance of this form is to be seen in the word *vavāhara* (1.2) and in *supavata* (1.14). The later form, in which the circle at the bottom has changed into a triangle is to be found in *Vāsudevānam* (1.1) of the Nanaghat inscriptions and in the majority of cases in the Hathigumpha inscription; cf. *sava* (1.1), *vidhi* (1.2), *vāta* (1.3), and *vase* (1.4). The palatal and lingual *śas* do not occur in the Nanaghat inscriptions and in the case of the dental *śa* we find different varieties. The Maurya form is to be found in the Hathigumpha inscription in *Sidhānam* (1.1), but not in the Nanaghat inscriptions. The later Maurya form is to be found in *Samkamsana* and *Vāsudevānam* in (1.1) of the Nanaghat inscriptions and in *sava* (1.1) of the Hathigumpha inscription. The early Kuṣāṇa form is to be found in the majority of cases in the Nanaghat inscriptions; cf. *kumāravarasa* and *Vedisirisa* (1.1), *sūrasa* and *cakusa* (1.2), *vadhanasa Sāgara* (1.3) and *devasa* (1.4). This form is to be found rarely in the Hathigumpha inscription where there is at least one clear instance in *vase* (1.5). Two different forms of the aspirate have been used in the Nanaghat inscription, (1) the Maurya form, in which the height of the left vertical line is undiminished as in *apratihata* (1.2) and *Mahārathino* (1.3). This form is also to be found in the Hathigumpha inscription in *Mahārājābhisecanam* and *vihata* (1.3), (2) the later Maurya form, in which the height limb is reduced, is to be found in the word *Kāhāpanā* in almost all instances in the Nanaghat inscriptions; cf. the instances in 1.10 of the first part. In the Hathigumpha inscription this later Maurya

¹ Cf. the forms of *la* in the last three lines of the Junagadh inscription of Rudradāman 1, e.g., *pālana* (1.18), *Kulainpa* and *acapālana* (1.19.) *Epi. Ind.*, Vol. VIII, pp. 44-45.

² The late Rao Bahadur Hoskote Krishna Sastri thought after examining the rock that this was *ja* and not *la*. Both the writer and Mr. K. P. Jayswal have examined this portion of the rock repeatedly and we are of opinion that Mr. Krishna Sastri was led to imagine a different form by the weatherings on the rock surface. *Vide. Annual Report, Arch. Survey of India, 1922-23, p. 130.*

form is to be seen in *haya* and *bahula* (1.4). The Hathigumpha inscription shows the later and angularised Early Kuṣaṇa form in *vavahara* (1.2) and *hita* (1.6).

IV. CONCLUSIONS.

We have seen above that the form of *a* and *bha* is earlier in the Nanaghat inscriptions but at the same time the forms of the following consonants do not differ in these inscriptions :—

(1) *ka*, (2) *kha*, (3) *ga*, (4) *ca*, (5) *cha*, (6) *ṭa*, (7) *ṭha*, (8) *ta*, (9) *tha*, (10) *dha*, (11) *na*, (12) *pa*, (13) *ba*, (14) *ma*, (15) *ya*, (16) *ra*, (17) *la*, (18) *va*, and (19) *sa*. Among these consonants, southern influence is distinctly to be felt in certain cases, in the Nanaghat inscriptions, which is totally absent in the Hathigumpha inscription. This southern influence is more pronounced in the Nanaghat inscriptions in the case of *la*, which shows that the peculiar southern form of this letter, which is also to be found in certain cases in the Junagadh rock inscription of Mahakṣatrapa Rudradāman I, and in *sa* to some extent. In two cases, the Hathigumpha inscription shows the use of the Early Kuṣaṇa form in addition to the form used in the Nanaghat inscriptions. Take, for example, *pa* and *ha* ; but it should be remembered in this connection that the land to the south of the Narmada was very little influenced by the Northern Kṣatrapa or Early Kuṣaṇa scripts, which became the precursors of all later Northern alphabets, but was not the precursor of any Southern alphabets. The former, to some extent, modified the Southern variety of the central group of Northern inscriptions of the fifth and sixth centuries A.D., as is evident from the Junagadh inscription of Skandagupta¹ and the Bijaygadh (Bayana) inscription of the Yaudheyas.² On the other hand, like the initial form of *a*, certain consonants in the Hathigumpha inscription show the use of forms which are certainly later than those used in the Nanaghat inscriptions. They are more particularly :—

- (1) The right-angled form of *Ja*.
- (2) The right-angled form of *da*.
- (3) The form of *bha* in which the left vertical is shorter than the right, and
- (4) The angular form of *ma*.

Thus the difference in the forms of letters used in these inscriptions are so very few, that the occurrence of certain later forms in any one of them cannot be taken to indicate a later date of that particular inscription ; specially in view of the fact, that the record, in which such later forms of characters were used, lies about a thousand miles distant from the other.

We must now return to Rai Bahadur Ramaprasad Chanda's arrangement of Brāhmī inscriptions from the third century B.C. to the first century A.D. He has recently reviewed his own position with regard to this arrangement in reply to certain criticisms which has appeared in the Journal and Proceedings of the Asiatic Society of Bengal.³ In this new contribution to the subject, Chanda has carefully

¹ Fleet—*Gupta Inscriptions*, pp. 56-61 : pl. VIII.

² *Ibid.*, p. 252 : pl. XXXVI, B.

³ See Vol. XVII, 1922, pp. 225-33.

confined himself to the votive inscriptions on the Sanchi *Stūpas*. He does not bring up the question of the general arrangement of Brāhmi inscriptions but confines himself to a broad classification of Northern Indian Brāhmi :—

- “1. Mauryan Brāhmi,
2. Early Śūṅga or second century B.C., variety of Brāhmi agreeing with the Mauryan Brāhmi in all particulars except the monumental forms of *a*, *bha*, *dha* and *ha*.
3. First century B.C., Brāhmi characterised by straight vertical lines with thickened tops called *serif*,
4. First century A.D., Brāhmi with equalised vertical lines.”¹

In his fresh contribution to the subject, Chanda has not touched the question of the Nanaghat or the Hathigumpha inscriptions. His previous conclusions on the arrangement of Brāhmi inscriptions was vitiated by the comparison of Northern inscriptions with those from the country to the south of the Narmada and the Vindhya. Palæographical examination is not possible with inscriptions lying more than a thousand miles apart. Such examinations are possible only in the case of a particular group of inscriptions from a particular locality; e.g., Kharoṣṭhi inscriptions from the Panjab and Afghanistan, but not in the case of Indian Kharoṣṭhi inscriptions with those discovered in Central Asia; and Northern Brāhmi inscriptions discovered in the region between Patna and Mathurā. Therefore Chanda's classification of votive inscriptions from Sanchi is perfectly accurate. The analysis of the characters of the Nanaghat and the Hathigumpha inscriptions will show that Chanda's latest classification is also wrong. The general tendencies of transitional forms are to be overdeveloped in one area and very slow in development in another. Let us take, for example, the inscription of a certain descendant of the first Śūṅga emperor Puṣyamitra discovered at Ayodhya. This inscription mentions Puṣyamitra as a *senāpati* but not a king. It purports to record the erection of *ketana* by one of his descendants.² The characters of this inscription fall into the fourth variety of Mr. Chanda's recent classification, but can the inscription be placed in the first century A.D.? Will Rai Bahadur Ramaprasad Chanda compare the characters of Ayodhya-inscription with the Śūṅga *torana* inscription from Bharhut and the Besnagar pillar inscription of the year 12 from the coronation of Mahārāja Bhāgavata? The Besnagar Garuḍa pillar inscription of Heliodoros, the ambassador of the Greek king, Antialkidas, was placed by Chanda immediately after the Nagarjuni and Barabar Cave inscriptions of Daśaratha. He placed too much reliance on numismatic evidence. The mistake of such a procedure has been proved by Prof. E. J. Rapson who places Antialkidas in 90 B.C., thus making him a century later than Puṣyamitra.³ I reserve the comparison of the Śūṅga inscriptions from Ayodhya, Kosambi, Bharhut, and Besnagar for a future occasion. But a glance at the facsimilies of the Ayodhya and Besnagar inscriptions will prove to the most casual reader that Chanda's most recent classification is also wrong.

¹ *Journal of the Bihar and Orissa Research Society*, Vol. XI, 1925, pp. 71-77.

² *Ibid.*, Vol. X, 1924, pp. 202-08; Vol. XIII, 1927, pp. 247-49.

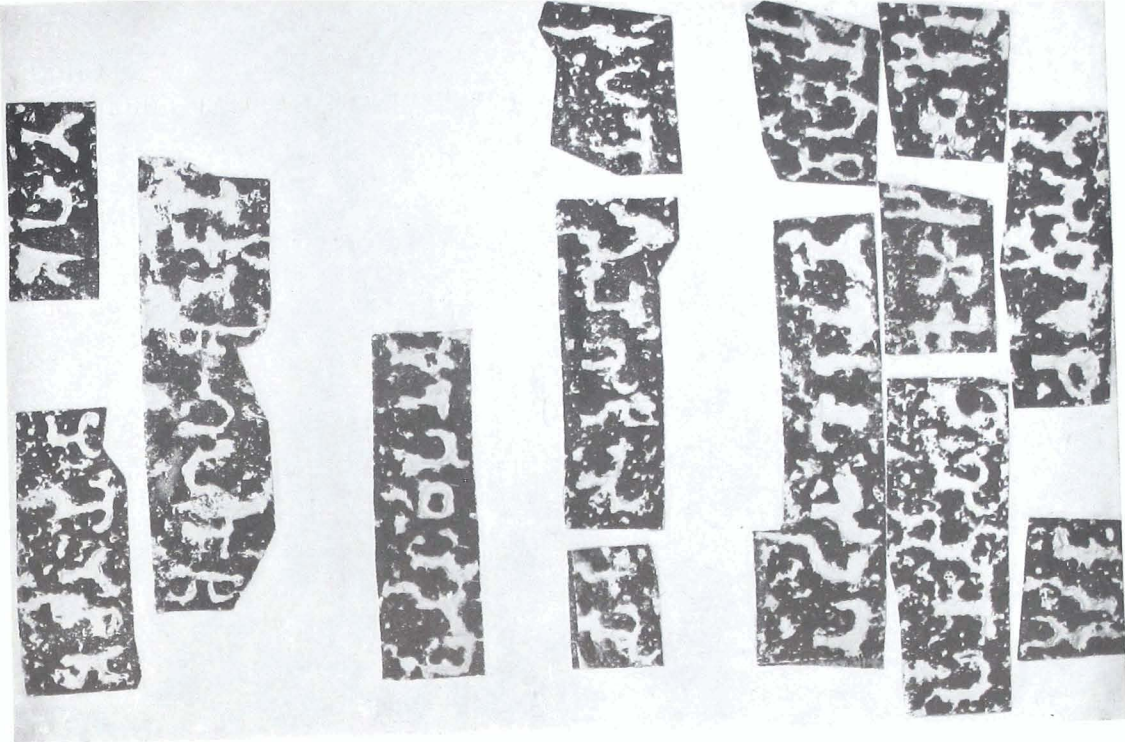
³ *Cambridge History of India*, Vol. I, p. 700.

The analysis of the characters of the Hathigumpha and Nanaghat inscriptions prove that the Hathigumpha inscription cannot be later than the Nanaghat inscriptions. The use of certain earlier forms in the Nanaghat inscriptions may seem to indicate that they are earlier in date than the Hathigumpha record but it should be remembered that the Nanaghat inscriptions show the use of a very large number of Kṣatrapa or early Kuṣaṇa forms side by side with older ones. Such survivals of early forms in inscriptions far away from the metropolitan district of India will prove to be veritable pitfalls for the unwary. Though the Hathigumpha and Nanaghat inscriptions lie far apart, the use of similar transitional forms indicate that their dates cannot be far distant from each other ; but in the chronological scale these two records should be placed in separate groups.



NOTE :—*The Author of this paper died at the early age of 46 years, on Friday 23rd May, 1930, at Calcutta, on the very day that print order was given on the proof.*—ED.

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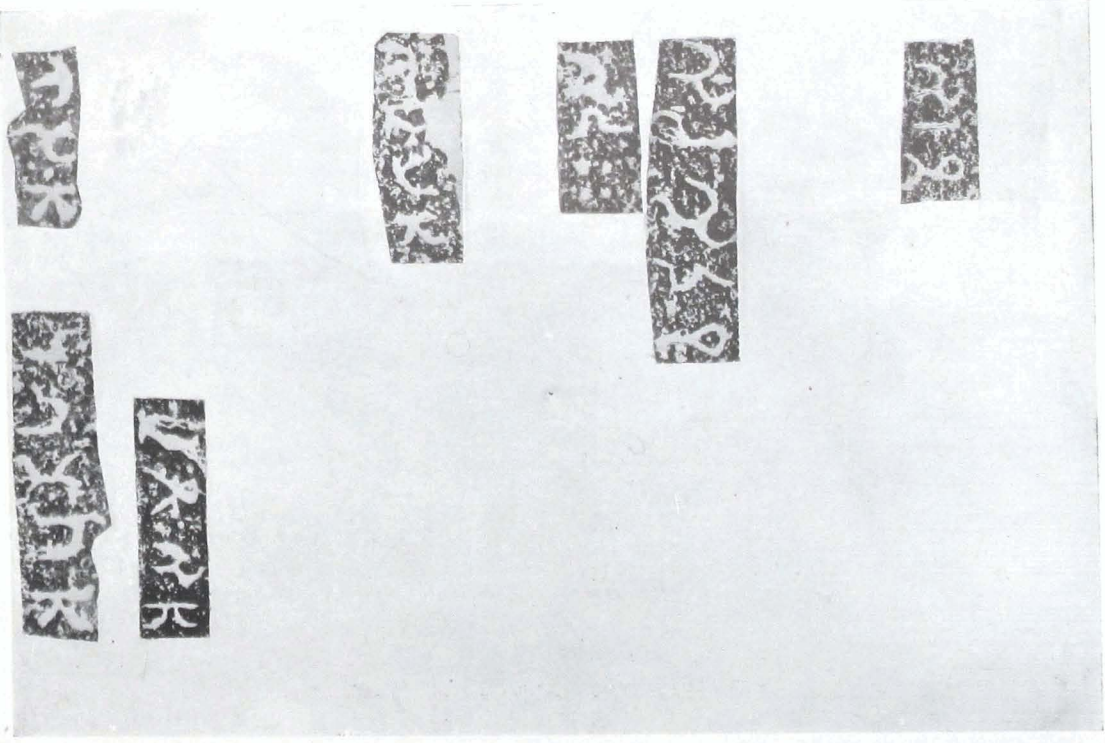
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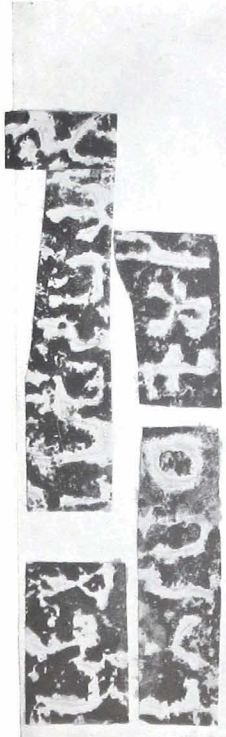
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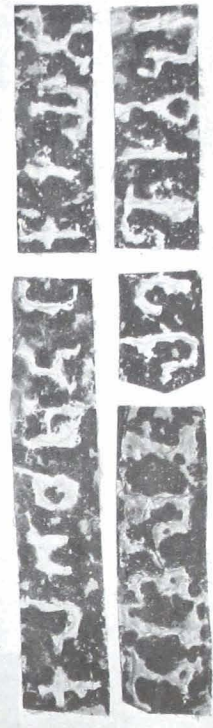


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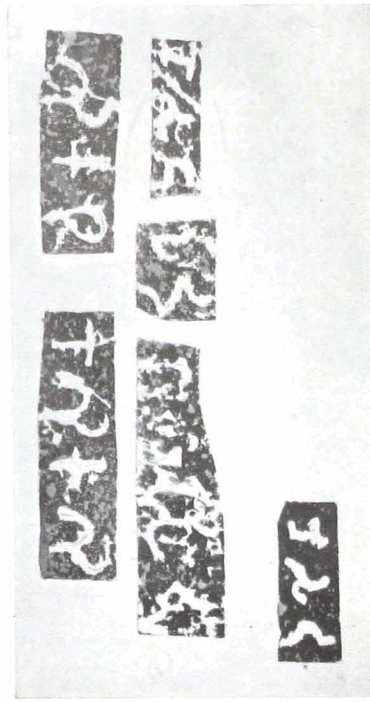


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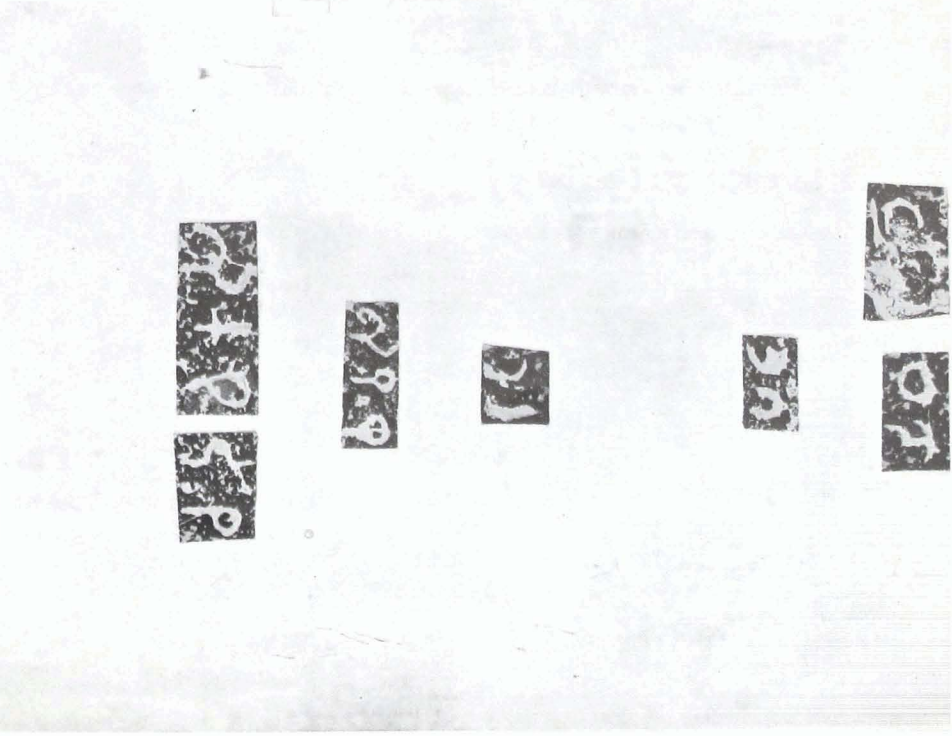


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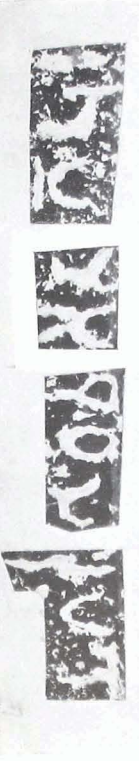
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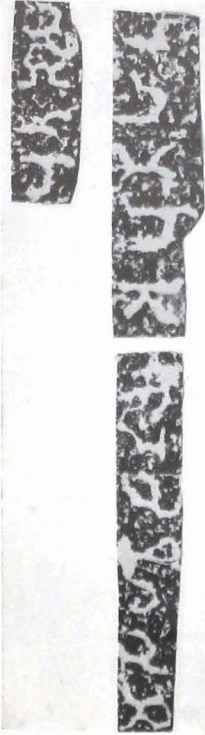


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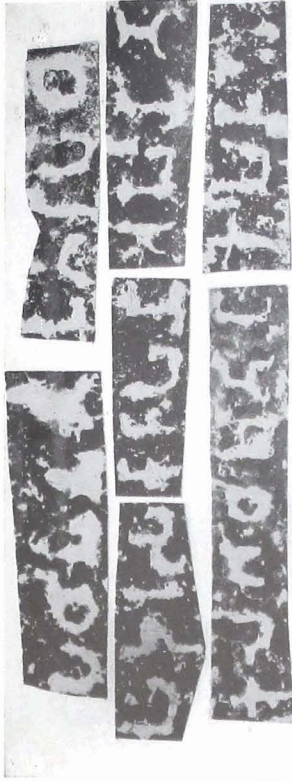


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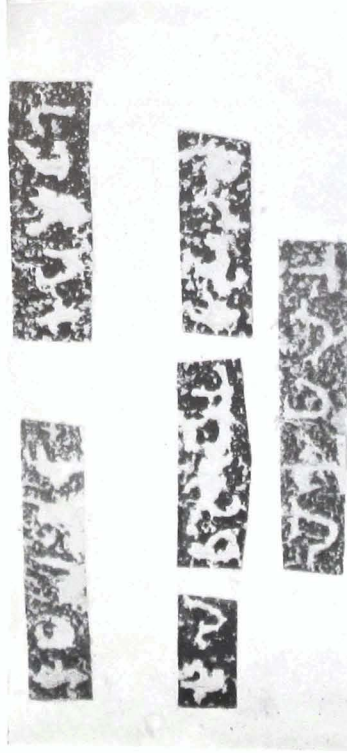
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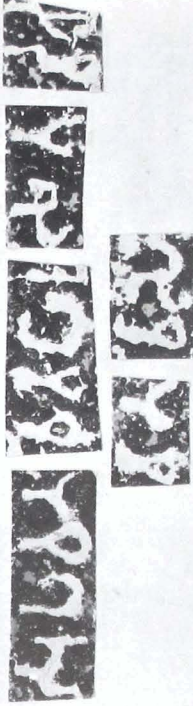
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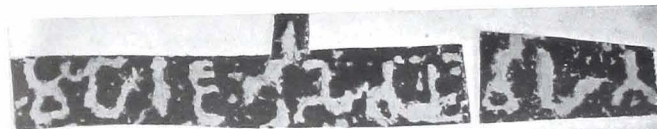


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STRING FIGURES FROM GUJARAT AND KATHIAWAR

By JAMES HORNELL, F.L.S., F.R.A.I.

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STRING FIGURES FROM GUJARAT AND KATHIAWAR.

By JAMES HORNELL, F.L.S., F.R.A.I.

The present is the first successful attempt to collect string games of the class frequently termed "Cat's Cradles", from Indian sources. Indeed, prior to the present collection, only two Indian games had been recorded, one, "Scissors", learned by Dr. A. C. Haddon from an Indian student at Cambridge (2, p. 78), the other, *Morna pag*, the Peacock's foot, shown to me in Fiji by a young man from Jamnagar and recorded in a collection from the South Sea (4, p. 87).

Those now to be described are all from Gujarat and Kathiawar; they were obtained early in 1930 when I was engaged upon a Fishery enquiry for the Government of Baroda.

Tabulation of the objects represented in string in this collection brings out the surprising result that none is of any complete animal or flowering plant. This may be accounted for by the fact that the great majority of my informants were town-dwellers. The outlook on life of these people is much circumscribed and so it is that the objects their string figures represent are taken mostly from the common objects of town life and household use, as scissors, a saw, a mirror, a lock and key, a betel plate, handcuffs, a chimney, the awning over a bier, fishing nets and a spinning wheel. Three figures represent the shapes of fruits, two the form of a bird's feet and one the nest of a crane; the two latter are the only ones of zoological interest. Natural features of the landscape and countryside receive equally scant attention—one is supposed to represent the form of a tank, and another a washing place in a river. Celestial bodies and mythological subjects are without representation. The conclusion is forced upon us that these people are so preoccupied with the struggle for existence that they have no time or thought save for the material interests of life.

The geographical distribution of such of these figures as are not local to India, as shown in the table which follows, reveals the striking fact that, if we except No. XXIX, the cosmopolitan Eurasian Cat's Cradle, of the ten games found also outside of India, nine are common to India and Africa, whilst the one exception, No. XIV, the Crane's Nest, is also found there in an identical final form, but worked out by different movements. The common possession of so large a proportion of these games emphasises how intimate and long-standing has been the connection of Indians with Africa, and in particular that of traders and sailors belonging to the ports of Gujarat and Kathiawar with East Africa, a trade that reaches back fully two thousand years. Such age-long contact of Indians with Negro tribes and of Arab sailors with Negro peoples on the one side and with Indian coast dwellers on the other has undoubtedly been

the main factor in this remarkable community of string games. What is now urgently required, is for other field workers in Indian Ethnology to collect the games still existing in inland regions and among hill-tribes and other isolated communities where old customs have not become altered out of recognition by contact with outside influences. The results should supply data which will enable us to judge how far the Gujarat and Kathiawar games here described are indigenous to India or if they are borrowed from African sources.

DISTRIBUTION OF INDIAN STRING GAMES IN OTHER REGIONS.

INDIA.		OTHER LOCALITIES.
No. II. Saw I ..	..	West Africa and Polynesia (Tahiti).
„ VI. Saw V ..	..	Zanzibar.
„ VII. Unnamed ..	..	West Africa and Polynesia.
„ IX. Knot I ..	..	Africa and Melanesia.
„ X. Knot II ..	..	West Africa.
„ XII. Peacock's foot ..	..	West Africa.
„ XIV. Crane's nest ..	..	Polynesia (distantly to Africa).
„ XXIV. The hand ..	..	Central and West Africa.
„ XXVI. At jali ..	..	West Africa.
„ XXVII. Machhi jal ..	..	West Africa and U.S.A. (Oklahoma).
„ XXIX. True Cat's cradle ..	..	Europe, Eastern Asia, Philippines, also Cyprus.

STRING TRICKS.

A considerable number of tricks performed with a loop of string are also commonly known throughout Gujarat and Kathiawar, but as they are all similar to tricks known throughout the world, no useful end is served by recording them. I have come definitely to the conclusion that string tricks are so cosmopolitan in their range that they possess no real ethnological value. Amongst those met with were the well-known "Mouse" (2, p. 80), "Fly on the nose" (2, p. 83) and Cunningham's "Hanging trick" (1, p. 124).

TERMINOLOGY.

In the description of the movements required to evolve the various figures, the employment of certain technical terms is desirable both for the sake of clarity in the instructions and also to avoid roundabout phrasing. The most important may be explained as follows:—

The back of the hand and of the fingers is termed the *dorsal* side or aspect; the inner side, the *palmar*. The little finger side of the hand, as also of each finger, is called the *ulnar*, the thumb side, the *radial*. A string passed around a digit forms a *loop*; the part which lies on the side towards the little finger is the ulnar string of the loop, the one towards the thumb, the radial string. The digits are referred to as thumb, index, middle finger, ring finger and little finger; in the diagrams the position of these fingers is indicated respectively by the numbers 1, 2, 3, 4, and 5. Similarly the direction of the rotation of a hand or a digit is designated the radial or the ulnar direction according as it describes an arc of a circle commencing respectively towards the thumb or towards the little finger side of the hand. When there are two loops upon a digit, the lower one is termed *proximal*, the higher, the one nearer the tip, the

NOTE:—The numbers in heavy type within brackets in the text are references to literature cited on page 164.

distal. It frequently happens that a loop has to be transferred from one digit to another. This is done, unless otherwise directed, by inserting the second digit from the lower or proximal aspect or direction into the loop and then lifting the strings off the original digit.

In commencing many string figures, one of two sets of operations is frequently employed. These have received conventional names which are employed commonly in order to avoid the verbiage of a detailed description of the movements involved. They are the following:—

Position 1.—Place the string of a closed loop on each hand by passing it over the tips of the thumb and little finger. This gives a figure where the string on each hand passes on the radial side from the palmar to the dorsal side of the thumb, across the dorsal surface of the thumb, to emerge to the palmar side from between the thumb and the index; thence it passes across the palm of the hand going again to the dorsal side between the ring and little fingers, across the back of the little finger, coming back round the ulnar side thereof, and then passing straight across to the ulnar side of the little finger of the other hand.

Opening A.—Make Position 1. Pass the index finger of the right hand behind the palmar string of the left hand from the proximal direction, and return to the original position (usually abbreviated to “return to position” or simply “return”) with a loop of the palmar string on the back of the index; repeat the operation conversely, drawing out the right palmar string upon the back of the left index. If made correctly, there will now be single loops on the thumb, index and little finger of each hand; the radial thumb strings and the ulnar little finger strings will cross straight from hand to hand, whilst the other four strings will form two pairs of crossed strings between the two direct straight ones.

Navahoing. When two loops are on a digit, one lower or proximal, the other upper or distal, to *navaho* is to lift the former over the latter, and set it free by passing it over the tip of the digit.

The cord employed should be smooth and pliable and about six feet and a half in length. The ends should be tied together by means of a reef knot, drawn as tight as possible, so that the knot may not present any impediment to the smooth running of the string. Manipulation is still easier, if the ends be spliced together.

I.—TAMBU, a tent, also DHUMADIA, a chimney.¹

1. Position 1, after crossing the strings of the loop.
2. Pass the index, middle and ring fingers of each hand under the opposite palmar loop and draw out.
3. A second player lifts and draws upwards the strings which cross one another at the centre of the figure.

By pulling upwards to a suitable extent, a “tent” is formed.

¹ Learned from a Hindu boy at Amrell, Kathlawar.

II.—KARVAT, *the saw (First method) or SHARDI, the drill.*¹

1. Place a closed loop around both wrists and make a second turn round the wrists by passing the radial string across each palm and then back across the back of the hand.

2. Insert the right thumb from below behind the string across the face of the left wrist and draw out; with the left thumb treat similarly the string across the face of the right wrist and extend.

3. The original player takes between his lips the radial string passing direct between the wrists, whilst a second player takes the corresponding ulnar string between the index and thumb of his right hand and pulls out.

4. The first player, holding fast the loops upon the thumbs by hooking them over the strings and pressing against the palms, passes each hand downwards through the wrist loops and lets the latter slide off.

5. The two players then see-saw the four resultant loops of which the first player has one between his lips and one on each thumb, whilst the second player has one loop only.

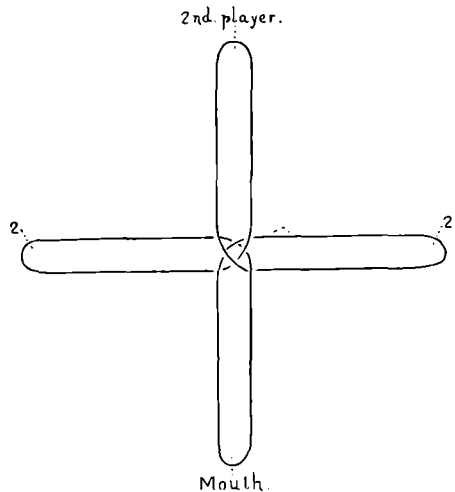


FIG. I.—Karvat.

¹ Learned at Billimora from Parsi boys and known also to Hindu boys at Amreli and Beyt in Kathiawar. At the latter place it goes by the name of *Shardi*, the drill.

This way of making the Saw is known also in Sierra Leone (5, p. 85) and in Tabiti, where it is called *Fotia*, the star (4, p. 80).

III.—KARVAT, *the saw (Second method).*¹

1. Position I.

2. Thrust each index behind the opposite palmar string from the distal direction; make a half turn in the loop and draw out to the full extent.

3. A second player lifts off the thumb and little finger loops and, holding the one loop in the right hand and the other in the left, saws to and fro against the loops held upon the first player's index fingers.

¹ Known to Parsi boys of Billimora and among Saraswath Brahmans.

IV.—KARVAT, *the saw (Third method)*.¹

1. Opening A, using the middle fingers to lift the palmar loops.
2. A second player with his right thumb and index lifts the little finger ulnar string over the ulnar pair of crossed strings and returns them under, catching them again with the same digits; he treats similarly the thumb radial, lifting it over and then returning it under the crossed radial strings.
3. The first player releases the loops on the middle and little fingers, retaining those on the thumbs.

Extending the loops, the two players are then able to imitate the action of sawing by alternately approximating the hands and drawing them apart.

¹ This figure was shown by Parsi boys at Billimora.

V.—KARVAT, *the saw (Fourth method)*.¹

1. Opening A.
2. Transfer the little finger loops to the thumbs.
3. Navaho the thumb loops, transferring the lower thumb loops to the little fingers, turning each loop over (a half turn) in doing so. (There are now four strings crossing at the centre, with one running straight across on the ulnar and another on the radial side.)
4. A second player seizes the little finger ulnar string, lifting off, and releasing the little finger loops at the same time, and draws out the seized string. Simultaneously the first player takes the thumb radial between his lips and pulls it towards him, releasing the thumb loops in the same action. Then, retaining the index-loops on the index fingers, he saws the strings in conjunction with the second player who holds what was the little finger ulnar in one hand.

¹ Learned from a Saraswath Brabman lady from South Kanara.

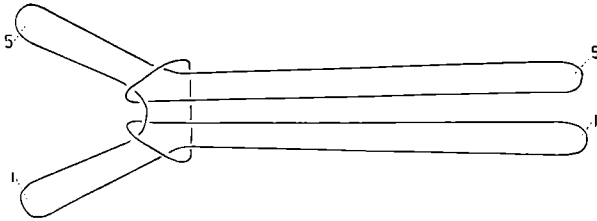
VI.—KARVAT, *the saw (Fifth method) or SHARDI, the pump-drill*.¹

1. Extend a loop between the big toes.
2. Make a small upright loop at the centre of the distal string and pass a loop of the proximal string through it.
3. A second player takes hold of the loop passed through, whilst the first one pulls back to his side the loop that was upright. The four loops are then see-sawed, the second pair being those upon the toes of the first player.

¹ At Beyt it is played by Hindu boys under the name of *Karvat*, but at Amreli it goes by the name of *Shardi*, the pump-drill, probably because carpentry is a flourishing industry there, so familiarizing the boys of that town with the action of this tool.

It is a variation of the Swahili *Sumeno* and probably these two had a common origin.

Qainchi, scissors, known in Delhi and Lucknow, and described by Miss Haddon (2, p. 78), is a sixth variation, related somewhat distantly to *Karvat* III already described, as it begins with Opening A; in the subsequent movements it is worked differently. The *Qainchi* method is also known in Makassar in the Celebes (4, p. 86).

VII.—*Unnamed.*¹FIG. 2.—*Unnamed*, at end of move 4.

1. Position I on the left hand, the rest of the loop hanging pendent in front.
2. With the right hand draw out to its full extent the palmar string on the left hand.
3. Repeat this movement.
4. Pass the right hand through the pendent loop. Insert the right little finger into the left little finger loop from the distal side and the right thumb into the left thumb loop, also distal. Draw out to the full extent.
5. From the ulnar side pass the four fingers of the right hand between the two upper and the two lower strings of the loops drawn out and open and close alternately the triangle under the left palm by partially rotating the right hand to and fro.

¹ Learned from a Muhammadan at Nausari.

This is the "Bad man" of the Marquesas (Handy, 3) and is also known to the Yorubas of Nigeria (Parkinson, 8, p. 136).

Another method of making this figure was found in Kathiawar under the name of "Lock and key" as described below.

VIII.—TALA KUNCHI, *the lock and its key*.

1. Position I on the left hand, leaving a long loop pendent in front of the hand.
2. Pass the lower end of the pendent loop through the left palmar loop from below and place it over the middle finger. Two pendent loops now exist; equalize them.
3. Partially closing the fingers of the left hand, pass the ends of the two pendent loops through the loop across the *back* of the middle finger from the distal side; pulling on these two loops drag off the middle finger loop; draw out the two loops to their full extent with the right hand.
4. Passing the fingers of the right hand into the double pendent loop from the radial side, a to and fro semi-rotary movement of the right hand, assisted by a similar movement of the left hand, produces an opening and shutting motion in the triangle in front of the left palm.

¹ Learned from the paggi (watchman) of the Rest-house at Amreli. It is a novel method of forming the figure described under No. VII.

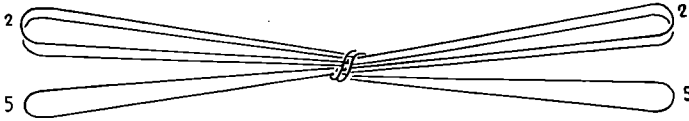
IX.—GANTH, *the knot*.¹

FIG. 3.—Ganth.

1. Extend a closed loop upon the little fingers.
2. Turn the left hand palm outwards so as to carry the two strings of the loop across the palm and round the ball of the thumb; dip the hand downwards under the two strings between the hands thereby bringing them across the back of the left hand and out again to the palmar side round the ulnar aspect of the little finger; pass the right hand strings across the right palm, out between the index and thumb and then back to the palmar side round the base of the thumb.
3. Insert the left index behind the right palmar loop from the proximal side and draw out; similarly draw out the left palmar loop upon the right index.
4. Holding the left index and little finger loops between the addressed fingers, draw the left hand downwards through the figure, so as to release the double loop across the back of the left hand, at the same time releasing the right thumb loop. A knot is now formed midway between the hands. To dissolve the figure, drop the index loops and draw the hands further apart.

¹ Except for unimportant differences, this game is the same as the Fijian *Kalokalo*, star (4, p. 18), and the *Sisia/watu* of the D'Entrecasteaux Archipelago (7, p. 314). It is also related to *Nzige*, the locust, from Uganda (1, 131), but more distantly, and to the *Aigeye* of Sierra Leone (5, p. 86).

X.—GHAT, *the knot*.¹

1. Make a slip knot at each end of a length of string and place one of these over the little finger of each hand.
2. Turning the right hand palm outwards, pass the string across the palm, out between the thumb and the index and then, rotating the hand as necessary, pass the string round the back of the hand, bringing it to the palmar side again from between the ring and little fingers.
3. Pass the other end of the string across the palm of the left hand, between the thumb and the index, bringing it to the palmar side round the back of the thumb.
4. Insert the right middle finger under the left palmar string from below and pull out; similarly pull out the right palmar string on the back of the left middle finger.
5. With the left index and the left thumb lift off the dorsal loop from the back of the right hand and drop it between the two hands; at the same time release the loop on the left thumb. Draw tight and a knot appears at the centre of the strings passing from hand to hand.

6. To dissolve, clap hands, drop the middle finger loops and draw the hands sharply apart.

¹ Learned from a fisher lad (Machhi caste) from Bulsar, Gujarat. *Ghat* is a corruption of *ganth*.

This game is identical to the smallest detail with the Mandingo *Kadijulu labo ibolado*, "Pull string from hand", of West Africa (Hornell, 5, p. 102).

XI.—BEDI, the handcuffs.¹

Part I.

1. Opening A, using the middle fingers to pass into the palmar loops, instead of the index fingers.

2. Another boy is invited to pass a hand through the centre of the figure from the distal direction, whereupon the first player releases the little and middle finger loops and draws his hands sharply apart. Result:—the second player's hand is caught by a string encircling his wrist.

Part II.

To release the hand:—

1. The first player inserts his little fingers into the thumb loops from below and then reconstructs Opening A.

2. The prisoner is told to reinsert his hand from the *proximal* side through the centre of the reconstructed figure, whereupon the first player releases all the loops save those on his thumbs. By extending the thumb loops that around the second player's wrist comes loose.

¹ Known to Parsi boys of Billimora and to Saraswath Brahmins from South Kanara.

XII.—MORNA PAG, the peacock's foot (First method).¹

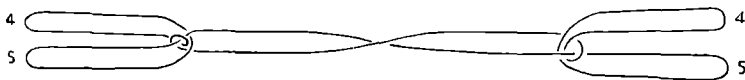


FIG. 4.—Morna pag.

1. Opening A.

2. Bend the ring fingers over the index loops and pass them from above into the thumb loops; straighten them and release the thumb loops, thus transferring them into ring finger loops.

3. With the index finger and thumb of the right hand seize the left little finger radial, carry it under the ring finger ulnar and lift it over the tip of the little finger; similarly treat the right little finger radial using the left index and thumb.

4. Navaho the little finger ulnar strings.

5. Drop the index loops and extend.

¹ This method of working a world-wide figure is distributed generally throughout Gujarat and Kathiawar and was met with at Baroda, Nausari, Borsl, Jamnagar, Amreli, Diu, Madhwar and other places. Its usual name is *Morna pag*, the peacock's foot, but at the fishing village of Borsl, on the Gujarat coast, it is known as *Bagli-no-pag*, the Crane's foot.

It is particularly widely distributed in Kathiawar, where it was shown in every town and village where enquiries were made. In many places it was the only string game known.

This game has the same movements as the Fula game of *Koidegeto*, and almost the same as the Temne *Karump* (first form), both from West Africa (5, 94). Although this figure has a world-wide distribution, the methods everywhere but in West Africa and West India are radically different. As the present method is so prevalent in the latter region, I am of opinion that it originated there and that the West African one has been carried there by Arabs, the Fulas having a strong Arab strain in their blood and being permeated with Arab culture. Kathiawar from its maritime situation on the north-west coast of India has had much contact with Arab sailors, a class very prone to learn and transmit such games as string figures. The identity of the Gujarati *ghat* with the Mandingo *hadjulu labo ibolabo* furnishes another striking link between India and West Africa.

XIII.—MORNA PAG, the peacock's foot (Second method).¹

1. Extend a closed loop between the big toes, sitting on the floor.
2. Extend the index and middle finger of each hand, keeping the ring and middle fingers pressed against the palm; seize the near string with the little fingers, pass the index fingers *under* this string, and over the far one; return, drawing the far string upwards upon the palmar side of the index fingers.
3. Release the index fingers, transferring their loops to the thumbs.
4. Insert the index fingers from the near side into the loop held on the thumbs, turn each index sideways away from the centre and hook up the far string towards the toes on the face of each index, passing the tip under it from the proximal side and returning through the median loop between the two hands; slip off the thumb loops.
5. Release the toe loops, transfer the little finger loops to the thumbs, passing the latter into them from below and extend.

¹ This most unusual manner of making this figure was learned from a Hindu boy at Amreli.

XIV.—BAGLI-NO-KOTHO, the nest of the crane (Gujarat) and KUVO-KARVO, making a well (Kathiawar).¹

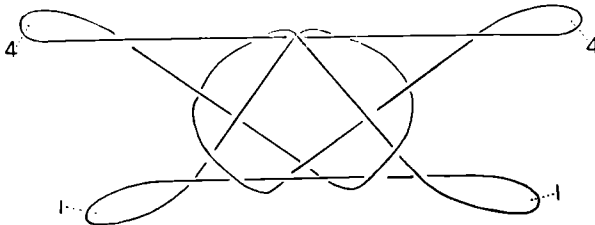


FIG. 5.—Bagli-no-kotho.

1. Opening A.
2. Lift off the thumb loops and drop them without turning over upon the ring fingers.
3. Lift off the little finger loops, pass them from the distal side through the index loops and place them on the thumbs.

4. Release the index loops and draw the hands slowly apart, when the figure appears.

¹ Shown by a boy of the fisher caste (Macchi) at Borsi, Gujarat, and by a Hindu boy at Amrell, Kathiawar; by the latter it was called *Kuvo harvo*, making a well.

Distribution.—This figure is widely distributed, being similar to the Central African *Mwezi*, the moon, described by Cunningham (1), the Samoan *Paa*, the crab (Hornell, 4, p. 73), and several other Oceanic figures, but the working of the Indian one differs radically from these except in the case of the Samoan *Paa*, where the movements although at first sight appearing different, are, upon analysis, found to be fundamentally similar.

XV.—JANAJA DAGNA or JANATA CHATTRI, *the awning over the bier*.¹

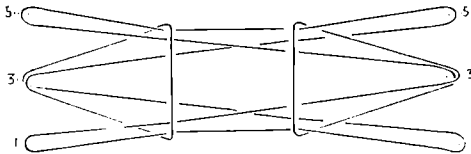


FIG. 6.—Janaja dagna.

1. Place a closed loop over the wrists.
2. Carry each ulnar wrist string over the top of the thumb and drop it between the thumb and index; similarly pass each radial wrist string over the top of the little finger and drop it between the ring and little fingers, taking care to pass it *under* the ulnar string.
3. Insert the middle finger of each hand under the crossed palmar strings of the opposite hand and draw out.
4. Lift the wrist loops over the tips of the fingers and drop them between the hands.
5. Extend and an excellent representation of the Muhammadan bier is obtained.

¹ Shown by a Muhamnadau of Nausari. This figure would have no significance for Hindus as they do not use coffins.

XVI.—CHASMA, *a mirror*.

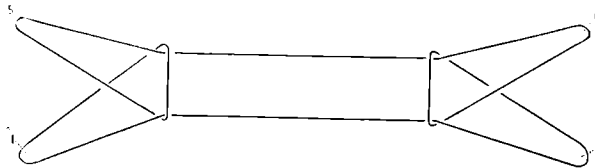


FIG. 7.—Chasma.

1. Make *Janaja dagna*.
2. Drop the middle finger loops and extend.

XVII.—KATAR, *the scissors*.¹

Chasma may be transformed into a moving figure called Katar, the scissors, by the left middle finger taking on its back the string crossing the parallel strings at the right-hand side, the right middle finger taking the left cross string.

The resultant figure gives a scissors movement when worked by alternately straightening and bending the fingers concerned.

¹ The two continuation figures (XVI and XVII) of *Janaja dagna* were obtained from the Nausari Muhamadan who showed the latter game.

XVIII.—SHINGODA, *a kind of fruit? (First method)*.¹

1 and 2. As in *Janaja dagna*.

3. Lift the wrist loops over the tips of the fingers, release them and draw the hands apart.

This is similar to *Chasma*, but is brought about in fewer movements.

¹ Obtained from a Muhamadan boy at Baroda.

XIX.—NADI AND CHIPRA, *the river and the dhoby's stones*.¹

1. Opening A, using the middle fingers instead of the index fingers.

2. Insert the ring fingers from above into the thumb loops and transfer them to the ring fingers.

3. Lift off the little finger loops, pass them from the distal side through the ring finger loops, then under the other strings, and place upon the thumbs.

4. Release the middle finger loops and extend.

The long narrow space bounded by two parallel lines in the centre represents the river, the triangle at each end, a dhoby's washing stone.

¹ Learned at Amreli from a Hindu boy.

This is a third method of forming the *Chasma* figure. A fourth is *Shingoda* II.

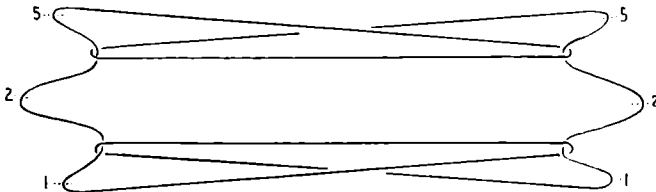
XX.—TALAO, *the tank*.¹

FIG. 8.—Talao.

1. Opening A.

2. Insert the little fingers from below into the index loops and return with the index ulnars on their backs.

3. Similarly take the index radials on the backs of the thumbs.
4. Navaho the thumb and little finger loops.
5. Extend and the figure appears.

¹ Shown by a Muhammadan α . Nausari.

XXXI.—KAMRAK or KAMAL KAKADI, a kind of fruit?¹

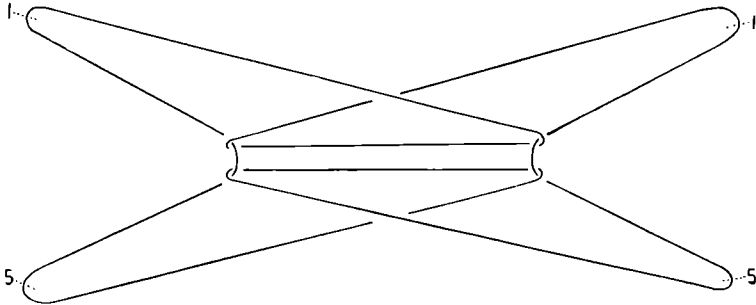


FIG. 9.—Kamrak.

1. Make *Talao*.
2. Release the index loops and extend, working the fingers till the parallel strings in the centre come together lengthwise across the central diamond.

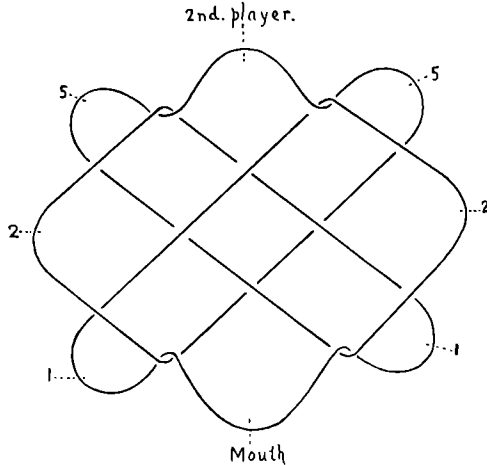
¹ At Baroda this figure is called *Kamal Kakadi*, whilst at Nausari, it is named *Kamrak*.

XXXII.—SHINGODA, a kind of fruit (*Second method*).¹

1. Make *Kamrak*.
2. With the lips lift off the left thumb loop and retain it between the lips.
3. Transfer the left little finger loop to the left thumb, the right little finger loop to the left little finger, the right thumb loop to the left little finger; place the loop held between the lips upon the right thumb.
4. Extend cautiously and the figure is obtained.

¹ Learned from a Muhammadan boy at Baroda.

The resultant figure is similar to *Chasma* and *Shingoda I*. It has a continuation called *Pandan*

XXIII.—PANDAN, a *plate to hold betel*.¹

1. Make Shingoda II.

2. Pass the left index under the string crossing the two parallel ones at the right-hand side, the right index taking up similarly the left transverse string and extend. (This gives a figure identical with *katar*, the scissors.)

3. The original player catches hold with his lips of the thumb radial at its central point where it crosses two other strings, and pulls it well out; a second player at the same time takes hold with the thumb and index of one hand of the little finger ulnar at the median point and draws out; the figure is then formed.

¹ Obtained at Baroda from a Muhammadan boy.

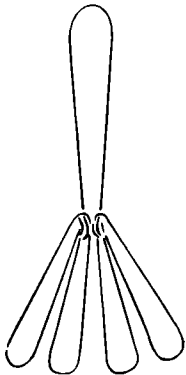
XXIV.—PANJO, the *hand* (First method).¹

FIG. 11.—Panjo.

1. Position I on the right hand only.
2. Draw out the palmar loop to its full extent.
3. Repeat movement 2.
4. Reflect the pendent loop over the three middle fingers of the right hand, so that one string passes between the little finger and the ring finger, and the other between the index and the thumb. There is now a pendent loop at the back of the hand.
5. With the fingers of the left hand draw out the little finger loop and the thumb loop to their full extent and hold the strings taut.
6. Bend down the right ring finger into the little finger loop, the index into the thumb loop, and the middle finger into the interval between these two loops. Then reflect the four strings held taut in the left hand over the downward-facing right hand

fingers, laying each string between each two digits in order, taking care to retain the loops on the thumb and little finger. When the four strings of the two long loops are reflected to the back of the hand, pass them distally through the loop crossing the back of the hand.

7. Pull out the loop across the back of the hand and bring it out gently to its full extent after carrying it to the palmar side over the tips of the three middle fingers.

This produces a four-looped figure representing a hand or paw.

¹ Obtained from a Hindu boy at the High School, Amreli.

XXV.—PANJO, *the hand (Second method)*.¹

1. Position I on one hand.
2. Pass the pendent loop under the palmar string *from below* and then over the three middle fingers as in move 4 of the first method.
- 3, 4 and 5, the same as 5, 6 and 7 of the same.

¹ This alternative method was learned from the paggi of Amreli Rest-house, a Kunbiyar pattadar.

XXVI.—AT JALI, *the 8-meshed net*.¹

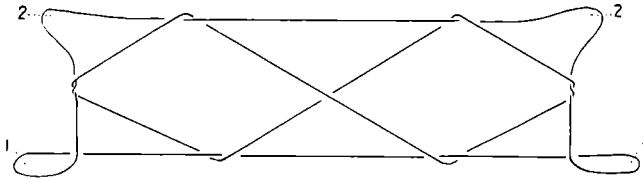


FIG. 12.—At jali.

1. Opening A.
2. Release the thumb loops.
3. From above insert the thumbs into the little finger loops and bring back the little finger ulnars on their backs.
4. Lift the index radials at a point close to the index face and place them upon the thumbs as loops.
5. Navaho the thumb loops of both hands.
6. Bend the index tips down and insert them into the small triangles which have their base formed by the string across the face of each thumb; press the tips against the palms.
7. Release the little finger loops, turn the hands palms outwards and straighten the index fingers; the figure is then revealed.

¹ Found at Baroda and at Diu; in both places shown by Muhammadan boys.

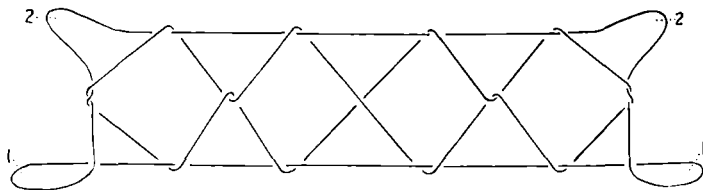
XXVII.—MACHHI JAL, *the fishing net.*¹

FIG. 13.—Machhi jal, the fishing net.

1. Opening A.
2. Release the thumb loops.
3. Pass the thumbs under all the strings, catch the little finger ulnars on their backs and return.
4. Going distal, insert the thumbs into the index loops, pick up the index ulnars on their backs and return to position.
5. Release the little finger loops.
6. Pass the little fingers distally over the index radials and pick up on their backs the thumb ulnars and return.
7. Release the thumb loops.
8. Take the little finger radials on the backs of the thumbs from above.
9. Lift the index radial close to the near side of the index and pass it over the thumb as a loop, both hands.
10. Navaho the thumb loops by turning the thumbs downwards into the inner thumb loops and then upwards outside thereof.
11. Insert the tip of each index into the triangle on the palmar side of the thumb and press it against the palm.
12. Release the little finger loops, turn the hands with the palms facing outwards, let the index loops slip off and straighten the index fingers. This extends the figure, displaying four diamonds.

¹ Learned from a Muhammadan at Nausari.

The preceding game, *At jali*, and this, are identical with the games called respectively "Two eyes" and "Four eyes" in West Africa (Hornell, 5, p. 91); in India they are considered to have eight and fourteen meshes respectively, each opening being counted a mesh, whereas in Africa only the diamonds are considered as meshes.

The Osage Indians of Oklahoma, U.S.A., have also a game identical in working with *Machhi jal*—Jayne's so-called "Osage Diamonds" (6, pp. 24-27), while an American priest whom I met in Samoa, informed me that he had been taught this game as a boy, under the name of "Jacob's Ladder." Can it be that this game reached the U.S.A. from Africa through the medium of the slave trade?

XXVIII.—RANTIA, *the spinning wheel*.¹

1. Sitting on the ground, extend a closed loop between the big toes. Place a stick three or four inches long between the two parallel strings, thus:—

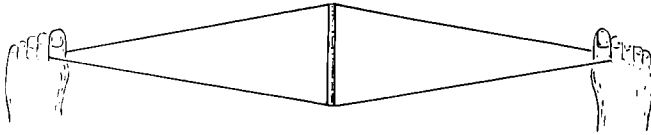


FIG. 14.—First stage of Rantia.

2. Twist the strings by revolving the stick in the manner of a tourniquet until the strings are as tightly twisted as possible. Hold one end of the stick against the ground to prevent the strings from untwisting.

3. Stretch a thin string horizontally across the open diamond, and hold a further length against the twisted cord at each end; release the rod and allow it to take charge, unwinding for five or six revolutions. This automatically winds the lateral portions of the thin string round the twisted cords. (Fig. 15.)

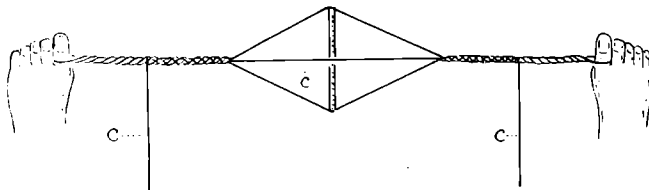


FIG. 15.—Second stage of Rantia.

4. By alternately pulling and letting go slack the two ends of the thin cord (C.C.), the diamond, representing the spinning wheel, is made to revolve rapidly, first in one direction and then in the opposite one.

¹ Shown by a boy of the oil-pressing caste (Ghanchi caste) at Billimora, who, appropriately enough, was wearing a Gandhi cap made of *kaddar*. It would be of much interest to learn whether this is an invention of long standing or of quite recent introduction. If the latter, it may be counted as one of the minor results of Mr. Gandhi's advocacy of spinning as a universal home industry.

XXIX.—THE TRUE CAT'S CRADLE.

This is well known in Western India where, however, there are two distinct openings; the first, the orthodox one as used in Europe, was the method employed by Hindu school boys at Amreli, who called the first figure formed, *Palang*, the cot, and the second, *Arsar*, the mirror.

The second method which is the usual and widely distributed one in Western India, opens as follows:—

1. Opening A.

2. The hands are placed palms together; a second player lifts the loop now pendent on the ulnar side of the little fingers, over the tips of these fingers, and drops it between the thumbs and the index fingers; similarly the loop pendent on the radial side of the thumbs is lifted over the tips of the index, middle and ring fingers and dropped between the ring and little fingers of the two hands, which are then drawn apart, giving the ordinary arrangement of the strings characteristic of the opening figure of this game.

The first serial figure formed is called the Cot or Bed by the Parsi boys of Billimora; the second, where the strings run parallel being *Nadi*, the River, whilst the next is termed *Katar*, the Scissors, the following one being *Machhi*, the Fish.¹

¹ The game opened in this unusual manner, was found among Parsi boys at Billimora and Nausari, Saraswath Brahmans of South Kanara, Hindu fisher lads from Bulsar and Gujarati Muhammadan boys.

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BY
KALIPADA BISWAS, M.A.



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By KALIPADA BISWAS,

Curator of the Herbarium, Royal Botanic Garden, Calcutta.

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AS A TOKEN OF GRATITUDE AND AFFECTIONATE DEVOTION.

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ALGAL FLORA OF THE CHILKA LAKE

By KALIPADA BISWAS.

INTRODUCTION.

The fauna of the Chilka Lake has been more or less thoroughly worked out by the concerted investigations of the late Dr. N. Annandale, and the officers of the Zoological Survey of India. The results have been published in the *Memoirs of the Indian Museum*, Vol. V. But though a large amount of zoological investigation has been done by specialists in different branches of zoology, not much has yet been done as regards the botanical survey of the lake and the islands in the lake.

Dr. Annandale's account of the vegetation of the lake, in his Introduction to the 'Fauna of the Chilka Lake', published in 1915, and also in his 'Introduction to the study of the fauna of an island in the Chilka Lake', published in 1922, appears to be complete with regard to the phanerogamic vegetation especially of the Barkuda island, but nothing has yet been done with regard to other islands of the lake and to the cryptogamic flora of the lake region as a whole. The cryptogamic flora which is mainly composed of algæ growing luxuriantly and profusely on rocks, boulders and pebbles on the fore-shore, on the leaves and stems of submerged plants have so far been left entirely unexplored. Recently, however, a short paper by the writer entitled (6) 'The Sub-ærial algæ of Barkuda island, in the Chilka Lake, Ganjam District, Madras Presidency', has been published in the *Journal of the Asiatic Society of Bengal* (New Series), Vol. XX, 1924, No. 6. (Issued on the 25th November, 1925.)

The late Dr. Annandale, who was an enthusiastic naturalist, not only took a keen interest in the fauna of the lake, but also spared no pains in collecting algæ from the lake during his zoological excursions. Both Dr. Annandale and I have found that there is an intimate connection between the algal vegetation and the fauna of the lake. Some of the algæ, mainly Diatoms, supply food to the invertebrate members of the fauna, and the larger algæ, such as the *Enteromorphas*, are a favourite food of the fishes of the lake. But one alga, *Lyngbya æstuarii*, is supposed to cause the death of a number of animal organisms. The sponge *Laxosuberites lacustris*, Annandale, lives intimately interwoven with *Lyngbya æstuarii* and looks blue-green in colour owing to the presence of this alga. The sponge also harbours a large number of Diatoms. *Lyngbya æstuarii*, again, together with Diatoms has been found mixed up with *Bimeria fluminalis*, Annandale, a Hydrozoon, and also with other *Polyzoa* (See Plate 25).

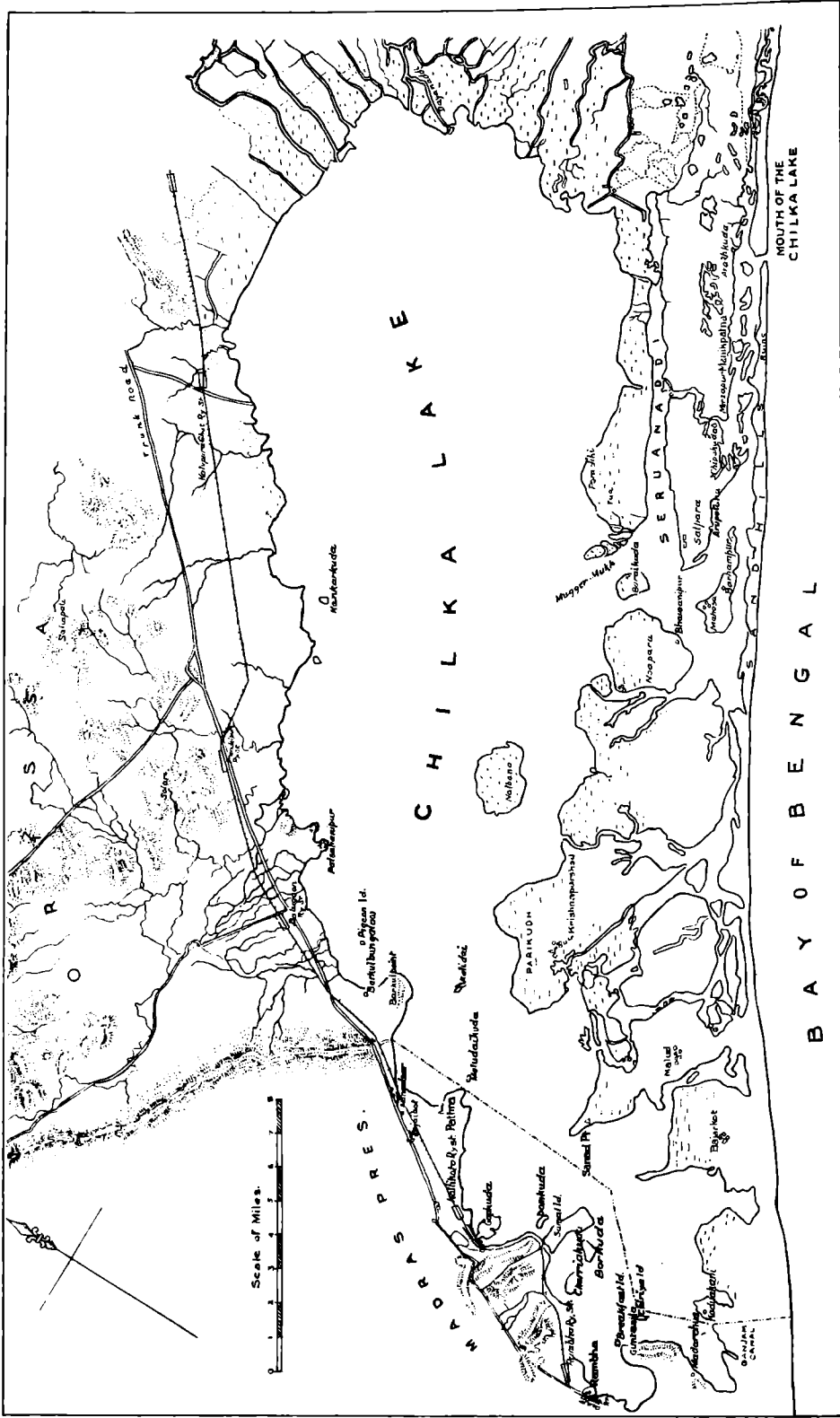
The collections made by Dr. Annandale were sent from time to time, from the year 1922 onwards up till his death on April 10th, 1924, to Dr. Paul Brühl, Professor

of Botany at the University of Calcutta, India. These materials were kindly presented to me by Professor Brühl for the purpose of study. Moreover, I paid a visit to the Chilka Lake with the late Dr. Annandale in the middle of March, for a fortnight, in the year 1924. During my stay there, I availed myself of the opportunity to collect specimens and to make copious notes with regard to the algal vegetation of the lake with the kind assistance of Dr. Annandale and Mr. Ferrout. A considerable portion of the notes given here regarding the general features of the lake and plankton algæ have been written after consulting the field-notes of Dr. Annandale and Dr. Stanley Kemp, recorded during the years 1914 and 1915, and their published papers mentioned in the list of literature. Some of the materials are housed in the Herbarium of the Royal Botanic Garden, and the rest are in the Indian Museum, Calcutta.

The present paper is but a preliminary study of the algal flora of the lake. As regards further detailed investigations, this will require several years' further study of the algal vegetation at different seasons of the year, as also of the periodic changes in the salinity of the water, which plays a very important part in the biology of the lake.

I have given in the following pages as much information as I have been able to gather from my personal experience and observation of the flora of the lake, supplemented by valuable suggestions and instructions from Dr. Annandale who, by his long investigation, gained considerable experience of the biology of the lake. (63) 'The Hydrography and Invertebrate fauna of Rambha Bay,' by Sewell and Annandale, published in the *Memoirs of the Indian Museum*, Vol. V, No. 10, August, 1922, will undoubtedly throw much more light on the intricate problems of the distribution and life-history of the algal flora of the lake, after the detailed taxonomy, including the Diatoms, has been worked out.

I am deeply indebted to the late Dr. Annandale, F.R.S., who helped me in every possible way in making this botanical investigation of the Chilka Lake. I am very grateful indeed to Lt.-Col. R. B. Seymour Sewell, I.M.S., Director, Zoological Survey of India, who has been good enough to lend me the private notes and records made by Dr. Annandale and others, to analyse the water samples of the Calcutta Salt-Lakes and to give me permission to copy maps, charts and some of the photographs forming part of the present paper. I am thankful also to Dr. P. Brühl, the late Professor of Botany, University of Calcutta, and Mr. C. C. Calder, Director, Botanical Survey of India, for their valuable suggestions.



GENERAL FEATURES OF THE LAKE.

The Chilka Lake is situated on the east coast of the peninsula of India partly in Orissa and partly in the Ganjam District, Madras Presidency, lying between $19^{\circ}28'$ and $19^{\circ}54'$ N. The total area of the lake is 350 sq. miles and the average depth is two fathoms (See Map. Plate 24).

The lake is divided into two portions: (i) the outer channel and (ii) the main area.

The outer channel is usually in direct communication with the sea by a narrow passage, which is only a few hundred yards in length and opens out into the main area at Mugger-Mukh. This passage is, however, sometimes blocked by a deposition of sand. The outer channel, together with a number of swamps, runs parallel to the sea and is separated from the main area of the lake by some islands and promontories.

The main area, which is about forty miles long and twelve and half miles at its greatest breadth, constitutes the lake proper. The shores are composed in some parts of grassy slopes reaching down to the edge of the water and in other places of sand hills with fishing villages, whilst some parts are rocky headlands and promontories.

The lake is mainly fed by the branches of the Mahanadi river system, of which the Dyanaddi, which falls into the lake at the north-east corner, is the most important. Some of the rocky islets are important both from a botanical and a zoological point of view, as they harbour a large number of algæ and invertebrates on the submerged portions of rocks and boulders jutting out into the water. The largest island is Nalbano, which is covered by a more or less pure association of *Phragmites Karka*.

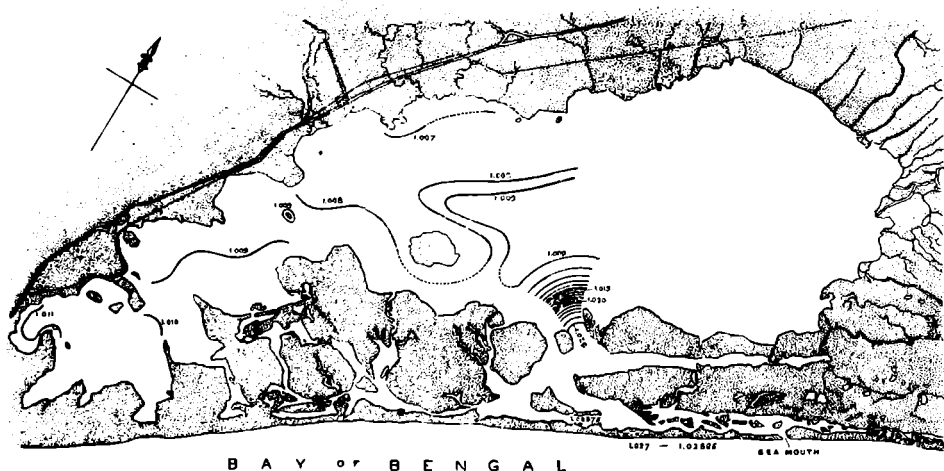
The major portion of the lake bottom consists of mud mixed with sand, but that of the outer channel is sandy. There are two zones of muddy materials, one a permanent grey clayey layer and the other consisting of suspended particles floating in the water and only deposited here and there in some quiet corner together with numerous specimens of Diatoms. In some places rotten vegetable and animal matter, such as shells of molluscs, algæ, stems, branches and leaves of *Potamogeton pectinatus* and *Halophila ovata* settle down at the bottom. Near the shore the water is only a few inches deep and the bottom is covered with a thick undergrowth of *Halophila ovata*, its leaves and branches looking muddy brown due to thick coating of Diatoms. The water is about four feet deep over an immense area and is hardly eight feet deep in some places. The greatest depth of the lake does not exceed twenty feet, but during the rains the average depth is increased by five or six feet. It

is very interesting to note the gradual rise and fall of the water of the lake as evidenced from the concentric rings of dried, half-dried and fresh algal deposits on the rocks and boulders (*See Plate 27, Fig. 2*).

The lake was once an open bay and then was 'a part of the sea first rendered shallow by the deposits from the mouths of the Mahanadi and from silt carried up the bay round the hills near Ganjam by the violent southerly winds of the monsoon and then entirely cut off by a spit, formed, by the same agency, of sand drifted along the coast' (Dr. W. T. Blanford).¹

HYDROGRAPHY OF THE LAKE.

There is a great periodic change in salinity in the water which controls to a large extent the biology of the lake. In the dry season the water of the outer channel is as salty as that of the Bay of Bengal, while that of the main area is brackish. But during and after the rainy season the water of both parts of the lake is almost fresh, while that of the south-western corner of the main area is slightly saline. The specific gravity of the water recorded in February and March varies from 1.00675 to 1.0115 and after the cessation of the rains in September, it ranges from 1.002 to 1.0065 (*See sketch below*).



¹ The specific gravity of the water of the lake in February and March, 1914. The specific gravities recorded in the main area varied from 1.00675 to 1.0115. (From Menu. Ind. Mus., Vol. V.)

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This considerable annual change in salinity is caused by the abundant discharge of fresh water from the Mahanadi branch system at the northern end during the rains; and at this time of the year, the water of the lake in the main area is quite fresh and contains many freshwater forms of both animals and plants. But if the

¹ W. T. Blanford—'Sketch of the Geology of Orissa,' *Rec. Geol. Surv. India*, V, p. 56, 1872.

mouth of the lake is kept open, the influx of sea-water after the rains is rather rapid due to tides and storms and also as a result of evaporation. This causes damage to many of the freshwater forms and displaces them by marine species. In certain years, however, the mouth appears to be closed.

The temperature of the water of the lake varies from 25° to 35°C, but this does not play a very important part in the distribution of the flora and fauna of the lake. In the rocky shores and shallow parts, especially where the water is only a few inches deep, the temperature is considerably higher than what is mentioned above, and sometimes this rise of temperature is the cause of death of some of the more delicate forms.

The Chilka Lake does not experience the full effect of the south-west monsoon, for a large part of the rain-storms is deflected by the hills near the mainland and some of it takes its direction towards the sand hills. Only occasionally a fringe of the banks of clouds finds its way into the lake region and over the islands of the lake. The average rainfall per year lies between 45 and 46 inches.

The climate of the lake region, as also that of the Barkuda and other islands, is tropical; but, as a matter of course, the climate is more equable than that of the mainland. During the months of February and March a steady breeze from south-west blows all day long, starting from 11 A.M., reaching its maximum at about 5 to 6 P.M., and subsiding late in the evening between 8 and 9 P.M. During this time the level of the water at the southern end of the lake sinks by two or three inches, but it rises again on a calm morning, when the water is almost perfectly at rest. Therefore the best time for collection is between 6 and 10 A.M. in the morning. There is no tide, especially further inland near the Barkuda island.

VEGETATION OF THE LAKE.

The Chilka Lake is rather poor in submerged phanerogamic vegetation. The only important plants are *Potamogeton pectinatus* and *Halophila ovata*. The former species forms crowded patches in sheltered places: but during the rains, it dies and floats on the surface in huge masses which are eventually stranded on the shore mixed up with a large amount of algæ, and, when the water recedes, are left there to decay emitting an offensive odour. *Halophila ovata* grows mostly in the shallow muddy portion of the main area sloping down gradually in the water. The leaves are coated with a thick deposit of mud, and give shelter to many interesting forms of Diatoms, to short filaments of *Lyngbya astuarii* and various animal organisms. Sometimes parts of *Halophila ovata* are dislodged from the bottom, due probably to the action of water birds, and then they float on the surface and are finally thrown upon the shore by the waves.

The phanerogamic vegetation of the islands of the lake varies widely according to the nature of the different types of islands in the lake. Some of these islands are mere sand-banks which remain submerged during the flood season, and chiefly specimens of *Cratava religiosa*, accompanied by a few sedges and grasses, are found

on them. Nalbano, the largest island, is covered by a more or less pure association of *Phragmites Karka*. Other rocky islands, promontories and peninsulas mostly harbour a mixed association predominantly of Bamboos (*Bambusa arundinacea*) growing along the sloping hill sides and often *Phragmites Karka*, associated with a few shrubs and herbs, forming a belt near the base. Indeed, the Chilka Lake with its rocky islands and its fringing hills, covered with a luxuriant vegetation, forms a delightful picture of rare beauty. The plant associations of the islands of Barkuda and Gonta Sila are very similar, combining semi-desert and deciduous types. The zone of *Pongamia glabra* confined only to the northern and the southern part of the Barkuda island forms a peculiar association, as illustrated in Plate 26, Fig. 1. A somewhat detailed account of the phanerogamic vegetation of the Barkuda island has been given in the *Memoirs of the Asiatic Society of Bengal*, Vol. VII, No. 4, pp. 257-319, (3) 'Introduction to the study of the fauna of an island in the Chilka Lake', by N. Annandale, V. Narayanaswami and H. G. Carter.

ALGÆ.

The algal flora of the Chilka Lake is not poor, though the number of species may not be so very large. The forms that grow there are interesting in having periodic changes in colour, in their different modes of fructification and from the standpoint of distribution. Diatoms of the Chilka Lake which are quite abundant, on stems, pebbles, sticks, submerged leaves and other similar materials must be of special interest to 'Diatom enthusiasts' for their varieties of shape, size and their beautiful markings and close association. One species of needle-shaped Diatom produces such an amount of mucus in which it is imbedded that sometimes the whole surface of a rock or submerged boulder is covered with it, forming thick, slimy, grey, and soft or leathery cushions of about 2-15 mm., in thickness, which can easily be detached from the substratum. They can be pressed down on mounting paper and so prepared as to form good herbarium specimens without much trouble.

The larger algæ generally grow profusely on pebbles, rocks and boulders, but they are almost entirely absent from the muddy fore-shore, on which are deposited in layers several species of Diatoms and fragments of other algæ. *Gracilaria confervoides* is the largest alga of the Chilka Lake and grows luxuriantly on submerged rocks and boulders. The alga changes its colour considerably as it is gradually exposed to the sun, when the level of the water of the lake sinks, and finally, when dead and dried up, it looks like a mass of white threads of cotton. The long drooping tufts of *Gracilaria confervoides* present a delightful moving picture on a fine evening along the shore of Barkuda island as they are constantly wafted to-and-fro by the waves whilst their firm holdfasts attach them securely to the substratum. The beauty of this species is further enhanced by contrast with the deep green colour of *Enteromorpha intestinalis*, forma *cornucopiae*, and the yellowish-green filaments of *Enteromorpha compressa*, growing in dense patches at the base of *Gracilaria*. These two species of *Enteromorpha* commonly grow in densely crowded cushions on the submerged rocks. On the lower part of the vertical face of the submerged rocks there is a thick and healthy growth of masses of *Grateloupia siliicina* with the fronds beauti-

fully variegated in colour and armed with spinous proliferations. The bottom stratum is chiefly coated with fine brownish-pink hair-like threads of *Polysiphonia subtilissima* studded with species of Diatoms. The rocks and pebbles on the fore-shore, as also pieces of stones lying in the water along the margin of the lake are almost invariably covered by *Cladophora glomerata*, Forma *callicoma*, which is occasionally mixed up with younger plants of *Enteromorpha compressa*. Interspersed with stouter plants of *Gracillaria confervoides* are often observed narrow and slender specimens of the same species. It is very interesting also to note the occurrence of epiphytic growth of small juvenile tufts of *Cladophora glomerata* forma *callicoma*, *Enteromorphas* especially *Enteromorpha compressa*, *Polysiphonia subtilissima*, or bunches of *Lyngbya aestuarii*, on the fronds of *Gracillaria confervoides* and *Grateloupia filicina*. The masses of floating debris of vegetable matter in the lake are mainly held together by fine interwoven threads of *Lyngbya aestuarii*, which is the most dominant species of the lake, and is generally observed floating in large entangled masses of blue-green colour in the more stagnant parts of the lake near the shore. Frequently the filaments of this alga appear muddy brown owing to thick deposit of Diatoms on them.

PLANKTON FLORA.

The plankton flora of the Chilka Lake is not particularly rich. It is dependent entirely on the nature of the water of the lake at two different seasons. During the wet season, when the water is more or less fresh, the lake contains many freshwater forms, but during the dry season the lake harbours a number of marine forms due to a quantity of sea-water finding its way into the lake from the Bay of Bengal. Several species of *Dinoflagellata* have been observed by Dr. Annandale. The bulk of the plankton flora, however, consists mainly of branches of *Potamogeton pectinatus*, *Halophila ovata*, parts of the fronds of *Gracillaria confervoides*, *Enteromorpha intestinalis*, var. *cornucopæ*, *Enteromorpha compressa*, and a large number of Diatoms, representing several genera:—*Synedra*, *Encyonema*, *Nitzschia*, *Melosira*, *Cymbella*, *Bacillaria* and others, mostly epiphytic on the plants mentioned above. These floating masses are commonly held together by a network of threads of *Lyngbya aestuarii*, which is often covered with Diatoms. Vegetative filaments of several species of *Spirogyra* are common among the plankton catches. The Diatoms of the Chilka Lake will be dealt with in detail in a separate paper.

The plankton debris, held together as it is, by entangled masses of *Lyngbya aestuarii*, is here and there deposited in layers on the fore-shore over a considerable area, mixed up with bushes of *Cladophora glomerata* Forma *callicoma*, *Gracillaria confervoides* and sometimes *Grateloupia filicina*. These masses of plankton debris, when thus deposited and dried up during the hot months, rest there as white spreading sheets, and they can easily be lifted up from the substratum. These sheets are gathered by the villagers of Satpara and used by them, instead of paper, for wrapping up parcels. It is interesting to note here that by the action of bacteria on these piled-up dead weeds and decaying vegetable matter sulphuretted hydrogen is formed which after partial oxidation gives rise to deposits of sulphur (See Plate 26, Fig. 2).

During the rains the lower branches of *Pongamia glabra*, which forms a regular zone on the south-western side of Barkuda island, remain partly submerged during the rainy season and after the cessation of floods the debris consisting of white masses of dead algæ, twigs and branches of *Potamogeton pectinatus*, *Potamogeton*, sp., and *Halophila ovata* remain like festoons on the lower branches (See Plate 26, Fig. 1).

A few freshwater forms and most of the marine forms except *Lyngbya æstuarii*, which have been recorded in this paper as plankton algæ are not all typical plankton species. Some of them are fragments of larger algæ other than plankton species but mentioned as such as they have been found floating in the water. Some of the freshwater forms find their way from the northern mainland into the lake through discharge of fresh water from the Mahanadi river and others are carried along from the fore-shore and other parts of the mainland with overflow water during the flood season. Most of the marine forms enter the lake with the inflowing water from the Bay of Bengal during the dry season.

Out of the total number of plankton samples of fifty-two phials, and out of forty-four bottles of specimens collected from different parts of the Chilka Lake, only twenty-two species have been recorded excluding Diatoms.

These twenty-two species represent thirteen genera and eight families. Of these again *Lyngbya æstuarii* is the dominant species of the plankton; it has been found in almost all the samples representing about 33·8% of the plankton algæ of the lake. The percentages of other algæ found in plankton catches are as follows:—*Gracillaria confervoides* (fragments)—1·45%; *Oscillatoria lætvirens* var *minima*—4·4%; *Ceramium elegans*—18·8%; *Polysiphonia* sp. (2)—4·4%; Diatoms—8·8%; *Cladophora glomerata*, forma *Callicoma*—2·9%; *Pithophora oedogonia* 2·9%; *Spirogyra* sp., as much as—17·65%; *Microcoleus chthonoplastes*—2·9%; *Lyngbya confervoides*—1·45%; *Phormidium* sp.—2·9%; *Chaetomorpha Linum*—4·4%; *Conferva* sp.—1·45%; *Lyngbya ærugeneo-coerulea*—1·45%. A list of stations at which plankton samples were collected is given below in a tabular form:—

No. of samples examined.	Date.	Station.	Place and time of collection.	Specific names.	Salinity gms., per 1,000 cc.s., Density, Specific gravity and Temperature.	Depth, Rainfall and other remarks.
I.	12th., January, 1914.	1	East side of Rambha Bay. 9-45 A.M., to 10-5 A.M.	(i) <i>A n a b æ n a torulosa</i> . (ii) <i>Phormidium fragile</i> , (iii) <i>P. corium</i> .	Sal., 15·57. Sp. gra., 10·1249 at 26·0°C. Density <i>in situ</i> 1·00850.	Depth 5½ ft., to 4½ ft. Townet.
II.	12th., February, 1914.	2	Off Chirya Island, 1 mile N.E. of the mouth of the Rambha Bay.	No Algæ.	Sal., 15·09. Density <i>in situ</i> 1·00807. Sp. gra., 1·01212. Temperature 26·0°C.	....

No. of samples examined.	Date.	Station.	Place and time of collection.	Specific names.	Salinity gms., per 1,000 cc.s., Density, Specific gravity and Temperature.	Depth, Rainfall and other remarks.
III.	14th., February, 1914.	8	Off Rambha Bay, 2.7 miles N.E., $\frac{1}{2}$ E. of Breakfast Island. 10-35 A.M., to 11-25 A.M.	<i>Lyngbya aestuarii</i> .	Sal., 14.12, Sp. gra., 1.01133, Temperature 26.4°C, Density <i>in situ</i> 1.00729.	Depth 6 $\frac{1}{2}$ ft. Canvas net and Townet.
IV. ..	14th., February, 1914.	10	1 $\frac{1}{2}$ miles west of Sanad Promontory, Rambha Bay, Kalikota to Kalidai. 1-30 P.M., to 2-10 P.M.	(i) <i>Anabaena torulosa</i> , (ii) <i>Spirogyra</i> sp., (iii) <i>Oscillatoria</i> var. <i>minima</i>.	....	Depth 6 ft., to 6 $\frac{1}{2}$ ft.
V. ..	14th., February, 1914.	11	Off Gopkuda Bay between Sanad Promontory and Samal Island.	No alga. ..	Sal., 13.67, Sp. gra., 1.01097, Temperature 26.5, Density <i>in situ</i> 1.00677.	....
VI. ..	15th., February, 1914.	15	Rambha Bay, off Boat harbour.	(i) <i>Oscillatoria chilkensis</i> , (ii) <i>Lyngbya aestuarii</i>.	....	....
VII. ..	20th., February, 1914.	27	Between Kalidai and Sanad Promontory, 1.8 miles N.W. by N., of Sanad Promontory, 4-15 P.M., to 5-48 P.M.	(i) <i>Spirogyra</i> sp.	Surface salinity 8.10. Surface temperature 27.1°C, Sp. gra., 1.00648, Density <i>in situ</i> 1.00261.	Depth 7 ft., —7 $\frac{1}{2}$ ft. Canvas net.
VIII. ..	21st., February, 1914.	30	Kalidai southwards, 6 miles S.S.W., of Kalidai Island. 3-25 P.M., to 4 P.M.	Healthy specimens of <i>Spirogyra</i> sp., without zygote.	....	Depth 8 ft., —10 ft. Canvas net.

No. of samples examined.	Date.	Station.	Place and time of collection.	Specific names.	Salinity gms., per 1,000 cc.s., Density, Specific gravity and Temperature.	Depth, Rainfall and other remarks.
IX. ..	24th., February, 1914.	36 Maludai	Mid-channel towards Pathra, 1·8 miles N. W., Sanad Promontory. 1·6 P.M., to 1·50 P.M.	<i>Spirogyra</i> sp., fragments without zygote.	....	6½ ft.,—8 ft. Trawl Canvas bag. Trawling towards east of Kalidai Island.
X. ..	24th., February, 1914.	37	Chilka Survey, Maludaikuda, along shore.	(i) <i>Lyngbya æstuarii</i>.	....	....
XI. ..	25th., February, 1914.	39	1½ miles N.E., x N½N., of Sanad Promontory. 11-15 AM., to 11-50 A.M.	(i) <i>Lyngbya æstuarii</i> , (ii) <i>Diatoms</i>.	....	Townet. 5½ ft. to 6½ ft.
XII. ..	1st., March, 1914.	42	Off Barkul Bay towards Kalidai 1·5 mile E.S.E., of Barkul Bunglow. 9-55 A.M., to 10-30 A.M.	(i) <i>Ceramium elegans</i> , (ii) <i>Lyngbya æstuarii</i> , (iii) <i>Cladophora glomerata</i> forma <i>calicoma</i> (fragments).	Surface salinity 11·17, Sp. gra., 1·00895, Surface temperature 26·3°C., Density <i>in situ</i> 1·00512.	5½ ft., to 7½ ft.
XIII. ..	3rd., March, 1914.	48	Off Barkul Bunglow, 2·9 miles E., of Barkul Bunglow.	No algae. ..	Sal. 12·07, Density of water 1·00500, Surface temperature 29°C., Sp. gra., 1·00969.	....
XIV. ..	4th., March, 1914.	53	Off Barkul Bunglow.	(i) <i>Lyngbya æstuarii</i>.	....	....
XV. ..	5th., March, 1914.	55	2·8 miles N.E., ½ of Kalidai. 3-52 P.M., to 4-40 P.M.	(i) <i>Ceramium elegans</i> .	Surface salinity 11·53, Temperature 28·8°C., Sp. gra., 1·00925, Density <i>in situ</i> 1·00676.	5 ft., to 6 ft. Canvas net.

No. of samples examined.	Date.	Station.	Place and time of collection.	Specific names.	Salinity gms., per 1,000 cc.s., Density, Specific gravity and Temperature.	Depth, Rainfall and other remarks.
XVI. ..	7th., March, 1914.	61	1 mile E. x N., of Patsahanipur.	(i) <i>Lyngbya æstuarii</i> .	Surface salinity 9.87, Surface temperature 28.7°C., Density <i>in situ</i> 1.00345, Sp. gra., 1.00791.	4½ ft., to 5½ ft. Townet.
XVII. ..	7th., March, 1914.	62	2.6 miles E., x S.½ S., of Patsahanipur.	(i) <i>Ceramium elegans</i> , (ii) <i>Spirogyra</i> sp.	....	5½ ft., to 5½ ft.
XVIII. ..	8th., March, 1914.	65	1.5 miles N., x E., of Kalidai.	No algæ. ..	....	Depth 7½ ft., to 7 ft.
XIX. ..	....	77	S., side of Satpara Island, Opposite Bungalow.	No algæ. ..	....	....
XX. ..	14th., March, 1914.	78	Along north end of Barhampur Island, in main channel.	(i) <i>Lyngbya æstuarii</i> , (ii) <i>Diatoms</i> .	Surface salinity 35.34, Density <i>in situ</i> 1.02233, Surface Temperature 29°C., Sp. gra., 1.02840.	Depth 6 ft. Townet.
XXI. ..	16th., March, 1914.	84	In main channel west of Satpara Island. 10-15 A.M., to 12-30 P.M.	(i) <i>Anabaena torulosa</i>.	....	Depth 3 ft., to 8 ft.
XXII. ..	19th., March, 1914.	90	Near outer Bar, one mile S.W., of the mouth.	(i) <i>Lyngbya æstuarii</i> , (ii) <i>Spirogyra</i> sp., (iii) <i>Diatom</i> sp.	....	Depth 6 ft. Clean sand without weeds. Townet.
XXIII. ..	20th., March, 1914.	92	West of Satpara Island. 6-30 A.M., to 7-30 A.M.	(i) <i>Lyngbya æstuarii</i>.	....	....

No. of samples examined.	Date.	Station.	Place and time of collection.	Specific names.	Salinity gms., per 1000 c.c.s., Density. Specific gravity and Temperature.	Depth, Rainfall and other remarks.
XXIV. . .	16th., July, 1914.	97	Between Barkuda Island to mainland to south of Barkuda Island.	No alga. . .	Sal., 20'65, Density <i>in situ</i> 1'02233, Temperature 29°C., Sp.gr., 1'01659.	....
XXV. . .	....	98	Between Barkuda and mainland.	....	Sal., 20'65, Sp. gra., 1'01659, Temperature 27'7°C, Density <i>in situ</i> 1'01200.	....
XXVI. . .	18th., July, 1914.	99	Between Domkuda and Sanad Island. 11 A.M., to 12 noon.	(i) <i>Diatoms</i> , (ii) <i>Oscillatoria chilkensis</i> .	Surface salinity 20'90, Temperature, 27'6°C., Sp. gra., 1'01679, Density <i>in situ</i> 1'01200.	Depth 5 ft., to 7 ft. Muslim Townet.
XXVII. . .	20th., July, 1914.	101	Between Charria and mainland.	(i) <i>Lyngbya aestuarii</i> .	Surface salinity 11'04, Temperature 26'4°C., Sp. gra., 1.00885, Density <i>in situ</i> 1'00500.	Depth 5 ft., to 7 ft. Barkul water, taken on shore, 3rd., August, 1914.
XXVIII. . .	2nd., September, 1914.	102	Channel between Satpara to Barkuda Island. 9-30 A.M., to 10-45 A.M.	(i) <i>Lyngbya aestuarii</i> , (ii) <i>Ceramium elegans</i>.	....	Depth 7½ ft., to 20 ft.
XXIX. . .	2nd., September, 1914.	103	Channel off Satpara. In Channel S.W., of Satpara promontory. 11 A.M., to 12-10 P.M.	(i) <i>Gracilaria confervoides</i> , (ii) <i>Lyngbya aestuarii</i> , (iii) <i>Spirogyra</i> sp., (iv) <i>Poly-siphonia</i> sp.	....	Depth 16 ft., to 20 ft.

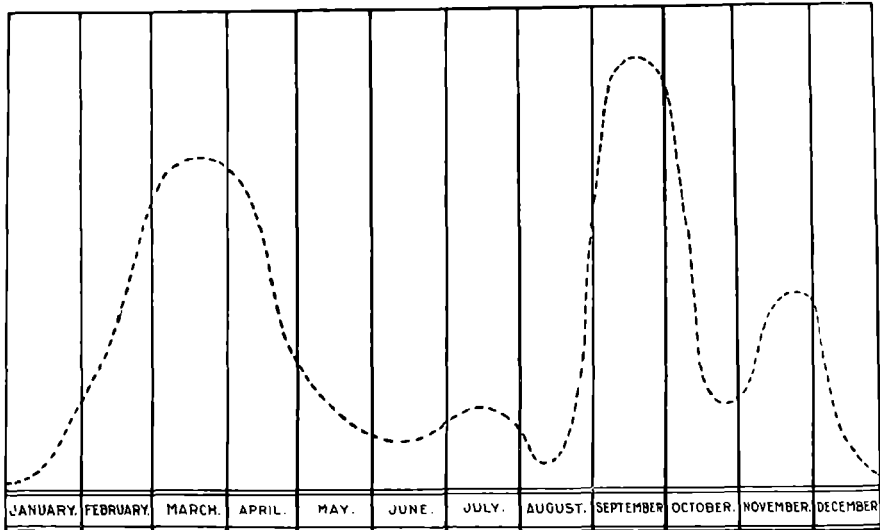
No. of samples examined.	Date.	Station.	Place and time of collection.	Specific names.	Salinity gms., per 1,000 cc.s., Density, Specific gravity and Temperature.	Depth, Rainfall and other remarks.
XXX. . .	3rd., September, 1914.	108	Outer Channel from Mirzapur towards Manicpatna. 1-40 P.M. to 1-58 P.M.	(i) <i>L y n g b y a æstuarii</i> , (ii) <i>Spirogyra</i> sp., (iii) <i>Microcoleus chthonoplastes</i> , (iv) <i>Polysiphonia</i> sp., (v) <i>L yn g b y a con-ferroides</i>.	....	Depth 12 ft., to 20 ft.
XXXI. . .	9th., September, 1914.	126	Channel Satpara Island to Barkuda Island. 8-55 A.M., to 11-25 A.M.	(i) <i>L y n g b y a æstuarii</i> , (ii) <i>Spirogyra</i> sp., (iii) <i>L yn g b y a Oærugineocærulea</i> .	Surface salinity 1.85, Sp. gra., 1.00141, Temperature 28.6°C, Density <i>in situ</i> 0.99750.	Depth 6 ft., to 9 ft.
XXXII. . .	10th., September, 1914.	128	Off southernmost Island of Manicpatna series. 11 A.M., to 11-45 A.M.	(i) <i>Microcoleus</i> sp., (ii) <i>Spirogyra</i> sp., (iii) <i>L y n g b y a æstuarii</i> .	Sal., 2.36, Density <i>in situ</i> 0.99700, Surface temperature 31.5°C., Sp. gra., 1.00183.	....
XXXIII. . .	12th., September, 1914.	133	Off Mahosa, main channel. 9-30 A.M., to 12-15 P.M.	(i) <i>L yn g b y a æstuarii</i> , (ii) <i>Spirogyra</i> sp.	....	Depth 4 ft., to 8 ft.
XXXIV. . .	15th., September, 1914.	134	1 to 1½ miles off Kalupara Ghat. 11 A.M., to 2 P.M.	(i) <i>L yn g b y a æstuarii</i> , (ii) <i>Os. latevirens</i> . var. <i>minima</i>.	....	Depth 6 ft. to 7 ft.
XXXV. . .	16th., September, 1914.	137	About 8 miles S.S.E., of Kalupara Ghat. 12-50 P.M., to 1-10 P.M.	(i) <i>L y n g b y a æstuarii</i> .	Sal, 0.63, Density <i>in situ</i> 0.99700, Temperature 28.5°C., Sp. gra., 1.00083.	Depth 8 ft.
XXXVI. . .	18th., September, 1914.	139	Barkul to Bungalow.	(i) <i>Ceramiu m elegans</i>.	....	....

No. of samples examined.	Date.	Station.	Place and time of collection.	Specific names.	Salinity gms., per 1,000 cc.s., Density, Specific gravity and Temperature.	Depth, Rainfall and other remarks.
XXXVII.	21st., September, 1914.	140	Off Kalidai. ..	No algae. ..	....	....
XXXVIII.	23rd., September, 1914.	142	Along Barkuda Island.	(i) <i>Pithophora ædogonia</i> , (ii) <i>Chaetomorpha Linum</i> .	Surface salinity 9.02, Density of water <i>in situ</i> 1.0030, Surface Temperature 28.1°C., Sp. gra., 1.00722.	....
XXXIX...	23rd., September, 1914.	143	Canal Bay, across the mouth of Rambha Bay. 10-45 A.M., to 1-15 P.M.	(i) <i>Chaetomorpha Linum</i> , (ii) <i>Diatoms</i>.	....	....
XI. ..	17th., November, 1914.	145	Across the mouth of Rambha Bay.	No algae. ..	....	Depth 6 ft., to 9 ft.
XLI. ..	19th., November, 1914.	148	Chirya Island to near Barkuda Island. 10-30 A.M., to 1-30 P.M.	(i) <i>Lynghya æstuarii</i> , (ii) <i>Anabæna torulosa</i>.	....	Townet.
XLII. ..	22nd., November, 1914.	152	Kalidai to Samalkuda.	No algae. ..	....	Townet.
XLIII. ..	29th., November, 1914.	165	....	No algae. ..	....	Depth 7 ft.
XLIV. ..	29th., November, 1914.	166	Anchorage at Barkul due east. 10-30 A.M., to 10-50 A.M. 3-20 P.M., to 3-40 P.M.	(i) <i>Ceramium elegans</i>.	....	....

SUPPLEMENTARY COLLECTIONS OF PLANKTON ALGÆ.

No. of samples.	Date.	Station.	Place and time of collection.	Specific names.	Salinity gms., per 1,000 cc.s., Density, Specific gravity and Temperature.	Depth, Rainfall and other remarks.
(a) ..	22nd., September, 1914.	....	From a pond in Barkuda Island.	(i) <i>Pithophora ædogonia</i>.	....	....
(b) ..	....	....	....	(i) <i>Spirogyra</i> sp.	....	....
(c) ..	....	....	....	(i) <i>Lyngbya æstuarii</i> , (ii) <i>Diatom</i> sp., (iii) <i>Cladophora glomerata</i> forma <i>Callicma</i> , (iv) <i>Polysiphonia</i> sp.	....	....
(d) ..	....	....	Kalidai southwards.	(i) <i>Lyngbya æstuarii</i> , (ii) <i>Diatoms</i>.	....	....
(e) ..	....	....	....	(i) <i>Oscillatoria læteviridis</i> var. <i>minima</i>.	....	....
(f) ..	....	....	....	(i) <i>Oscillatoria chilkensis</i> , (ii) <i>Ceramium elegans</i> , (iii) <i>Chaetomorpha Linum</i>.	....	....
(g) ..	....	....	....	(i) <i>Lyngbya æstuarii</i> , (ii) <i>Conserva</i> sp.	....	....
(h) ..	April, 1914.	....	Guntasila to Guntasila.	(i) <i>Lyngbya æstuarii</i> , (ii) <i>Oscillatoria chilkensis</i>.	....	....

The prevalence of the plankton algæ of the lake during the course of a year can be represented by the following diagram :—



Thus to classify the plankton algæ of the Chilka Lake roughly according to Transeau, the most dominant perennial form of the lake is *Lyngbya aestuarii*, which is a permanent lake-dweller. Fragments of a species of *Spirogyra* can also be found to be present in the lake throughout the year. The greatest number and variety of both freshwater and salt-water forms present in the lake is found during the month of September, as shown in the above diagram. This is due to the bulk of the fresh-water, which finds its way into the lake during the rainy season, and is not entirely displaced by the increasing sea-water during the dry weather.

COMPARISON OF THE CHILKA LAKE WITH THE CALCUTTA SALT-LAKES.

The Calcutta Salt-Lakes have not yet been worked out so thoroughly, as regards their hydrography and fauna, as the Chilka Lake. In my recent paper (8,1926) on the 'Flora of the Salt-Lakes, Calcutta', I was not able to deal with the hydrography, especially as regards the salinity, specific gravity and temperature of the water of the lakes to the extent that Annandale, Kemp and Sewell had done regarding the Chilka Lake. But I have attempted to investigate the flora of the two lakes as comprehensively as possible with special reference to algæ, excluding, however, Bacillariacæ, which will be dealt with in a subsequent paper. A comparison of the two lakes brings out many interesting features of the vegetation of the two areas; as the vegetation of these two lakes is adapted to different situations and governed by different environmental factors.

In considering the two lakes from their geographical and physiological

standpoint, it is found that each is quite different from the other. The Chilka Lake with its clear-cut boundary is a lagoon directly communicating with the open sea and lies between $19^{\circ}28'$ and $19^{\circ}54'$ northern latitude and occupies an area of 350 square miles; this is about thirteen times larger than the total area—26 square miles—of the Calcutta Salt-Lakes. But the Calcutta Salt-Lakes are situated further north, between Latitude $22^{\circ}27'$ and $22^{\circ}36'$ N. Their position is far inland and they are connected only remotely with the sea by some of the tidal creeks and rivers of the Gangetic Delta.

The Halogen content of the water of the salt-lakes and its tributaries, canals, etc., vary widely in different localities and in different seasons. Excluding such areas as pools, etc., which are completely isolated from the Lake system, the range of the Halogen content in different months is as follows:—

MONTH	MAXIMUM	MINIMUM
February	.. 13.18	.. 5.30
April	.. 8.56	.. 7.48
May	.. 10.22	.. 8.51
July	.. 3.29	.. 0.52

There is thus a steady rise in the minimum content from February to May, during the dry season, followed by a marked fall in July at the onset of the rains.

The nature of algal flora of both the Chilka Lake and the Calcutta Salt-Lakes is somewhat similar, in so far as the marine forms predominate during the dry season and freshwater forms prevail during the wet season, due mainly to difference of salinity in the water. The Chilka Lake, however, is almost free from Halogen contents and, consequently, there is rarely any 'polysaprob' alga growing there. The Chilka Lake is thus marked by the entire absence of the common feature, noticed in the salt-lakes, namely, the occurrence of the thin yellowish-green or green films consisting of an aggregate of various species of 'polysaprob' algæ—chiefly *Euglena* sp., *Pandorina Morum*, *Arthospira platensis*, *Spirulina major* and species of *Oscillatoria* and *Diatoms*. *Microcystis aeruginosa*, that predominates in the salt-lakes and especially in the canals, colouring the water blue-green, is entirely absent in the Chilka Lake. The swampy mangrove nature of the Calcutta Salt-Lakes helps the growth of brackish-water and salt-water forms of algæ in them whereas the Chilka Lake harbours typical marine forms of algæ, only a few freshwater forms finding their way in during the flood season.

The Chilka Lake was originally a part of the sea. The Calcutta Salt-Lakes on the other hand are probably the beds of some large distributaries of the river Hooghly. The depth of the Chilka Lake varies from 4 to 20 feet, but the average depth of the salt-lakes varies from 1 to 3 feet. Portions of the Calcutta Salt-Lakes are enclosed by embankments through openings in which water is brought in by the floods, and when the tide recedes, bunds are thrown across those openings. Thus the fish carried in by the flood tide are imprisoned, until it suits the convenience of the lessee of the fishery to catch them. The source of the freshwater supply of the Chilka Lake is in the main the Mahanadi river system. But the salt-lakes get

their supply of water from the tidal river Bidyadhari and various khals, some of which carry a large amount of sewage, refuse matter and mud from the town of Calcutta.

The Calcutta Salt-Lakes are much more influenced by winds, tides, temperature and rainfall than the Chilka Lake and this fact is also partly responsible for variation in the distribution of the plants of the two lakes.

The most important factors which cause differences in the vegetation of the two lakes are the edaphic and hydrographic factors, and also the origin of the lakes themselves. The Chilka Lake, which is one vast expanse of water interrupted only by a number of islands and peninsulas is, as has already been stated, connected with the sea on one side and is regularly fed by a considerable amount of freshwater from the Mahanadi river on the north every year during the wet seasons. The salt-lakes, on the other hand, consist of a considerable number of shallow depressions filled with saline water, the salinity of which varies considerably during the wet and dry seasons as shown in the table. These lakes are surrounded by, or alternating with, extensive stretches of marshy lands and occupy a portion of the Gangetic Delta intersected by a network of creeks and channels. The lakes are also connected with the storm-water and sewage canals of Calcutta. The water is muddy, foul and often emits offensive smells, owing to a large number of fish which have been carried in with the tide and are afterwards left behind in what becomes a putrescent swamp. When the tidal water recedes, their decomposition is accelerated by the hot rays of the sun. The water of the salt-lakes is therefore, as a matter of course, very poor in oxygen, but rich in halogen content which varies in proportion to the salt contents. The lakes therefore rarely harbour any submerged vegetation except either a species of grass which sometimes reaches above the surface of the water, or occasionally layers of 'mesosaprob' and 'polysaprob' Cyanophyceæ and Diatoms at the bottom in some flooded and marshy parts colouring the water blue-green. The prevalence of *Enteromorpha prolifera* and the blue-green 'polysaprob' algæ before and after the rains, when the flood-water sinks to its normal depth is due to the greater salt and halogen contents of the water.—(See Table below).

TABLE SHOWING HALOGEN CONTENT, TOTAL SALINITY AND SPECIFIC GRAVITY OF THE WATER OF DIFFERENT LOCALITIES OF THE CALCUTTA SALT-LAKES AT DIFFERENT SEASONS OF THE YEAR.

Nos. of samples.	Names of places and Station Nos.	Date, time and tide.	Halogen Content.	Total salinity.	Specific gravity.
I.	¹ Z.S.I. Station No. I. A large pond connected with the canal off Lausdowne Jute Mill.	17th., February, 1928.	7.04	12.74	1.01022.

¹ Z.S.I.—Zoological Survey of India. Z.S.I., wherever noted, signifies that the records have been taken by the Zoological Survey of India and quoted here with the kind permission of Lt.-Col. R. B. S. Sewell, I.M.S., Director, Zoological Survey of India.

Nos. of samples.	Names of places and Station Nos.	Date, time and tide.	Halogen Content.	Total salinity.	Specific gravity.
2.	Z.S.I. Station No. 2. Canal off Lansdowne Jute Mill and Dakhindari village.	23rd., February, 1928.	5.30	9.60	1.00769.
3.	Z.S.I. Station No. 3. North of the Salt-lakes near Dakhindari.	24th., February, 1928.	13.18	23.66	1.01900.
4.	Z.S.I. Station No. 4. Pond near the canal.	9th., March, 1928.	16.00	28.91	1.02322.
5.	Bidyadhari river, northend.	28th., April 1928. 1-10 P.M. Low tide.	7.59	13.73	1.01102.
6.	Bheri water—(salt-lake—typical).	28th., April, 1928. 12-30 P.M. Low tide.	7.89	14.27	1.01146.
7.	Pool used for bathing, drinking and cooking purposes.	28th., April, 1928. 12-45 P.M. Low tide.	3.30	5.99	1.00477.
8.	Paran Chaprasi's Khal. Salt-lakes proper.	28th., April, 1928. 11-30 A.M. Low tide.	8.56	15.48	1.01243.
9.	Bheri water (small shallow embanked water reservoir). Salt-lakes proper.	28th., April, 1928. 11-20 A.M.	7.67	13.87	1.01114.
10.	New cut canal at Chingri-gkata lock gate.	28th., April, 1928. 10-15 A.M. Low tide.	7.48	13.53	1.01086.
11.	Salt-lakes proper (shallow wide areas of water reservoir enclosed by bund.)	28th., April, 1928. 12-20 P.M.	8.29	14.99	1.01204.
12.	Z.S.I. Station No. 2. Canal off Lansdowne Jute Mill and Dakhindari village.	13th., May, 1926. 7 A.M. Low tide.	10.08	18.22	1.01464.

Nos. of samples.	Names of places and Station Nos.	Date, time and tide.	Halogen Content.	Total salinity.	Specific gravity.
13.	Z.S.I. Station No. 3. North of Salt-lake near Dakhindari.	13th., May, 1926. 7 A.M. Low tide.	8.51	15.37	1.01234.
14.	Z.S.I. Station No. 2. Dakhindari Canal off Lansdowne Jute Mill and Dakhindari village.	14th., May, 1926. 12.30 A.M. High tide.	10.22	18.48	1.01484.
15.	Z.S.I. Station No. 3. North end of Salt-lake near Dakhindari.	14th., May, 1926. 12.15 A.M. High tide.	9.51	17.18	1.01380.
16.	Paran Chaprasi's Khal. Salt-lakes proper.	8th., July, 1928. 1.40 P.M. Low tide.	3.29	5.97	1.00475.
17.	Bidyadhari river, near Chingrighata lock gate.	8th., July, 1928. 3.30 P.M. High tide.	2.85	5.17	1.00411.
18.	Salt-lakes proper (Sirkar's Bheri).	8th., July, 1928. 2.20 P.M.	2.68	4.87	1.00386.
19.	Chandi Bose's area of pisciculture. Salt-lakes proper.	9th., July, 1928. 6.10 A.M.	0.80	1.48	1.00116.
20.	Kojati. Hara-Kristo Mandal's Bheri. Salt-lakes proper.	9th., July, 1928. 6 A.M.	2.33	4.24	1.00335.
21.	Bantola Khal.	9th., July, 1928. 7.30 A.M. Low tide.	0.52	0.97	1.00060.
22.	New cut canal near Chingri-ghata lock gate.	9th., July, 1928. 9.45 A.M. Low tide.	2.57	4.67	1.00370.

The vegetation of the salt-lakes has been classified by me into three distinct zones: first, the vegetation of the embankments and bunds; secondly, the vegetation of the salt-lakes proper; and thirdly, the vegetation of swamps which during the hot season are partly dry and partly flooded. These three zones more or less represent a mangrove formation somewhat similar to that of the deltaic regions of other Indian rivers. The algal flora, as pointed out in my paper entitled 'Flora of the

Salt-Lakes, Calcutta,' is either 'mesosaprob', 'oligosaprob', or more frequently 'polysaprob'. The bottom of the lakes is often free from any plant growth, but occasionally, in very shallow portions, there is on the flooded ground thick layers of Cyanophyceæ and Diatoms, which often are dislodged from the bottom, and then float on the surface as small sheets of mucous scums. Among the plankton algæ *Microcystis æruginosa* and *Oscillatoria subsalsa* are most common in the canals, khals and deeper lakes. *Pandorina Morum*, *Spirulina major* and green films of *Euglena* sp., and *Chorella vulgaris* are not very uncommon on the surface of shallow pools and lakes. *Oscillatoria princeps*, *Oscillatoria latevivens*, *Oscillatoria Salina* and Diatoms are frequently met with, forming slimy masses adhering to the soil in marshy portions of the lakes. Other algæ which are typical of the lakes are *Enteromorpha intestinalis* and *Chatomorpha Linum*, which often float on the water in large compact masses especially near the edges. The former supplies food to fishes; *Polysiphonia angustissima* is often found attached to bricks, wooden pillars and submerged portions of country boats. The brown rusty coloured scum often found along the edges of some of the lakes and swampy areas is due to the presence of an Iron bacterium *Leptothrix ochracea* in large masses. This alga looks rusty brown due to thick deposit of iron hydroxide on its sheath.

It is interesting to note that *Enteromorpha prolifera* which is found in great abundance floating in the Calcutta Salt-Lakes, serving as food to fishes, has also been observed floating in the Salt-Lakes at Ennur, in the Madras Presidency. The Salt-Lakes at Ennur, near Madras, however, have direct communication with the Bay of Bengal and they are to a large extent similar to the Chilka Lake as regards the vegetation. The algal flora, which is mostly marine, is closely related to that occurring in the Chilka Lake, some of the species being common to both the lakes.

The Chilka Lake, in contrast to the Calcutta Salt-Lakes, is at once marked out by the entire absence of mangrove plants on its fore-shore and on the islands and rocky promontories, except Nalbano, the largest island, which contains a somewhat pure association of *Phragmites Karka*. On the other hand, most of the islands are to a large extent overgrown with bamboos. The submerged vegetation of the Chilka Lake mainly consists of *Potamogeton pectinatus*, *Potamogeton* sp., and *Halophila ovata* with their leaves coated with a large number of epiphytic Diatoms. This submerged vegetation supplies a considerable amount of Oxygen to the water of the lakes. The Oxygen thus supplied is helpful to the rich fauna of the lake. Moreover, the water is agitated far more by the free play of the waves due to a steady breeze starting from 10 or 11 A.M. in the morning and gradually subsiding at night. The water, which contains an appreciable percentage of salt during the dry months, is quite clear except during cyclonic disturbances and during the floods, when a considerable amount of freshwater is discharged into the lake displacing for sometime the salt-water of the sea. For most of the year the light can penetrate deep down into the water and stimulate the growth of the submerged vegetation.

Another feature of the Chilka Lake, which distinguishes it from the Calcutta Salt-Lakes, is that the discharge of river-water brings in several freshwater forms

into the lake. Therefore the climax of the plankton algæ of the lake is reached during the month of September, when the lake contains the largest amount of fresh-water, as has been shown in the chart. But the fresh-water after the month of September is gradually replaced by the ingress of salt-water from the sea. The most common alga of the Chilka Lake is the estuarine form of the typical *Lynghya æstuarii*. The other permanent forms of algæ of the lake are: *Gracilaria confervoides*, *Grateloupia filicina*, *Enteromorpha intestinalis*, forma *cornucopiæ*, *Enteromorpha compressa*, *Cladophora glomerata*, forma *callicoma*, all of which grow profusely on rocks on the fore-shore either of the mainland or of the islands of the lake.

SYSTEMATIC.

I. MYXOPHYCEÆ.

Family—(i) OSCILLATORIACEÆ.

1. *Oscillatoria chilkensis* sp. nova.

(Plate 28, Fig. I.)

Trichomatibus 4 μ diam., subrectis, ad-genicula breviter constrictis; apice breviter attenuatis, rarius breviter undulatis; cellula apicali obtuso-rotundatis, calyptra nulla; articulis subquadratis vel diametro 2-plo brevioribus, 2 μ longis; dessepiementis haud granulatis; contentu homogeneo, pallide caeruleo-ærugineo.

Trichomes 4 μ in diameter, somewhat curved, slightly constricted at the joints; apex of trichome very shortly tapering, very rarely undulated never hooked; apical cell obtusely rounded, never pointed nor capitate, calyptra none; cells shorter than the diameter, about 2 μ in length, transverse walls never granulated, cell contents homogeneous, pale blue-green.

This new species from the Chilka Lake is allied to the salt-water species *Oscillatoria salinarum* Collins, and *Oscillatoria latevirens* Crouan, but differs from them in the following characters: *Oscillatoria salinarum* is characterised by its trichomes being flexuous, coiled in a regular circle, much constricted at the joints and the cells nearly as long as broad. The trichomes of *Oscillatoria latevirens* are straight and fragile, 3-5 μ wide and the cells 2.5-5 μ long. Apex undulating or hooked; apical cell obtuse or pointed and the transverse walls granulated. In some characters this new species resembles the freshwater forms of *Oscillatoria Chlorinu* and *Oscillatoria formosa*. The former differs from the new species in its trichome not being constricted, the cells being 3.5-8 μ in length and the trichomes being straight or curved towards the apex. The latter differs from the new Chilka species in its trichome being 4-6 μ in diameter, and its hooked apex; the cells are 2.5-5 μ in length and the cell contents bright blue-green and finely granular.

Hab.: Chilka Lake.

2. *Oscillatoria laetevirens* (Crouan) Gomont.

var. *mimima* var. nova.

(Plate 28, Fig. 2.)

Trichomatibus 2.5–3 μ crassis, fragilibus ad-genicula breviter constrictis; apice breviter attenuatis, undulatis et uncinatis; cellula apicali plus minusve subacuta, haud capitata, calyptra nulla; articulis-diametro 2 plo-brevioribus, 1.5–2 μ longis, dessipientis uniformiter-granulatis, granulis trinis, refringentioribus notatis, contentu homogeneo granulato, ærugineo-viridi.

Trichomes 2.5–3 μ in diameter, somewhat fragile, slightly constricted at the joints; apex of trichome shortly tapering, more or less curved and sinuous, not distinctly hooked; apical cell acute and somewhat pointed, not capitate; calyptra none; cells 1.5–2 μ in length; partition walls marked by a row of three distinct granules on either side; cell contents uniformly granular blue-green.

This variety differs from the typical species in its smaller dimension and having uniformly 3 granules on both the sides of the partition walls.

Hab.: Floating as plankton, in the Chilka Lake with other algæ. Collected by Dr. Annandale, on the 14th February, and 15th September, 1915, from stations No. 10 and 134. This form is present in the Lake almost throughout the year, but not in such a great abundance as *Lyngbya æstuarii*.

3. *Phormidium fragile* (Meneghini) Gomont.

De-Toni, Syll. Alg. Myx., p. 220, 1907; Kalipada Biswas, 'The Sub-ærial Algæ of Barkuda Island, in the Chilka Lake', Jour. and Proceedings Asiatic Society of Bengal (New Series), Vol. XX, No. 6, p. 362, 1924.

Hab.: Occurring as solitary floating filaments in the Chilka Lake, Rambha Bay; collected by Dr. Annandale on the 12th February, 1914. This species has evidently found its way from the fore-shore into the lake.

4. *Phormidium corium* (Agardh) Gomont.

De-Toni, Syll. Alg. Myx., p. 235, 1907; Kalipada Biswas, 'The Sub-ærial Algæ of Barkuda Island, in the Chilka Lake', Jour. and Proceedings Asiatic Society of Bengal (New Series), Vol. XX, No. 6, p. 363, 1924.

Hab.: This species also has been found in the same condition as the above species.

5. *Phormidium submembranaceum* (Ardissone and Strafforells) Gomont.

(Plate 28, Fig. 3.)

De-Toni, Syll. Alga. Myx., p. 244, 1907.

Filaments long, flexuous, sheaths not present; trichomes 6 μ in diameter, constricted at the joints, apex of trichome straight, gradually tapering; apical cell showing a somewhat depressed, slightly rounded calyptra; cells somewhat quadrate, about

4–8 μ in length ; partition walls without a row of granules ; cell contents homogeneous blue-green.

Hab. : On the lower face of rocks and boulders, near the pier at Barkuda island. Collected by Dr. N. Annandale on the 18th March, 1924.

This species is interesting in so far as it is associated with the sponge *Laxosuberites lacustris* and another Polyzoon, *Bimaria fluminalis*. The plant is entangled with the branches of the animals, but evidently there is no special symbiotic relationship between the two but a simple association.

6. *Lyngbya ærugineo-cærulea* (Kuetzing) Gomont.

(Plate 28, Fig. 4.)

De-Toni, Syll. Alg. Myx., p. 281, 1907 ; Paul Brühl and Kalipada Biswas, 'Indian Bark Algæ', Jour. of the Department of Science, Vol. V, p. 10, 1923 ; K. Biswas, 'Road Slimes of Calcutta', Jour. of the Department of Science, Vol. VII, p. 6, 1925.

The Chilka Lake form of *Lyngbya ærugineo-cærulea* varies from the typical species in having filaments 6 μ in width ; its sheath 1 μ in thickness ; its trichomes 4 μ in diameter ; its cells more or less quadrate or slightly longer than the diameter, about 4–8 μ in length ; its partition walls distinct, pellucid, without any row of granules on either side and its contents granular and blue-green.

Hab. : Floating on the surface. Collected by Dr. Annandale, dated the 9th September, 1914.

7. *Lyngbya æstuarii* (Martens) Liebmann.

(Plate 28, Fig. 5.)

De-Toni, Syll. Alg. Myx., p. 262, 1907 ; Paul Brühl and Kalipada Biswas, 'Indian Bark Algæ', Jour. of the Department of Science, Calcutta University, Vol. V, p. 5, 1923.

Plant mass very much expanded, sometimes forming woolly layers on moist sand or earth but often floating in huge masses on the surface of the water or more commonly remaining suspended as large entangled masses in stagnant water, very faintly coloured or dark or bright blue-green ; filaments 14–22 μ in width, long tenacious, flexuous, twisted or tortuous, densely crowded and much interwoven ; sheath at first hyaline, firm, smooth, not lamellose, commonly 1.5–2 μ in thickness but later on becoming thick, rough on the surface and lamellose ; trichomes 8–14 μ in diameter, blue-green or olive-green, not constricted at the joints ; apex of trichome very slightly tapering and more or less capitate, commonly truncate, somewhat obtusely rounded, sometimes showing a slightly thickened outer membrane ; cells 2–4 μ in length ; cell contents granular, blue-green or olive-green.

Hab. : Mostly floating in large entangled masses throughout the year and when left on the fore-shore forming extended sheets of densely interwoven threads mixed with various dead algæ. The filaments almost always harbour epiphytic diatoms.

Collected by Dr. Annandale and the author mostly as plankton algæ from various parts of the lake.

8. *Lyngbya confervoides* C. Agardh.

(Plate 28, Fig. 6.)

De-Toni, Syll. Alg. Myx., p. 271, 1907; Tilden, Minnesota Algæ, p. 119, 1910.

Filaments long, blue-green or yellowish-green, 14–30 μ in width; sheath at first colourless, but later on becoming thick, brown, very much lamellose, roughened on the outer surface about 2–5 μ in thickness; trichome straight, 10–20 μ in diameter, not constricted at the articulations; apex of trichome not tapering; apical cell truncate and broadly rounded; calyptra none; cells 2 μ in length; transverse walls usually marked by a row of granules on either side; contents granular, blue-green.

Hab.: Floating in the water. Collected by Dr. Annandale, dated 3rd September, 1914.

9. *Microcoleus chthonoplastes* (Flora Darica) Thuret.

(Plate 28, Fig. 7.)

De-Toni, Syll. Alg. Myx., p. 371, 1907; L. Geitler and A. Pascher, Cyanophyceæ, Die Süßwasserflora Deutschlands, Osterreichs und der Schweiz, Heft—12, pp. 434, 437, 1925.

Filaments long, flexuous, more or less twisted, 44–50 μ in width; sheath cylindrical, more or less unequal and somewhat roughened in outline, hyaline; trichomes 4 μ in diameter, constricted at the joints, densely aggregated into bundles, rarely twisted into cords; apex of trichome tapering; apical cell not capitate, sub-acute or acute conical; cells 4–6–10 μ in length; transverse walls not granulated; cell contents granular, blue-green.

Hab.: Floating in water. Collected by Dr. Annandale, on 3rd September, 1914.

10. *Microcoleus paludosus* (Kuetzing) Gomont.

De-Toni, Syll. Alg. Myx., p. 376, 1907; 'Road Slimes of Calcutta', K. Biswas, Jour. of the Department of Science, Calcutta University, Vol. VII, p. 6, 1925; 'The sub-aerial algæ of Barkuda Island in the Chilka Lake', Jour. and Proceedings Asiatic Society of Bengal (New Series), Vol. XX, No. 6, 1924, L. Geitler and A. Pascher. Die Süßwasserflora Deutschlands, Osterreichs und der Schweiz, Heft 12, Cyanophyceæ, p. 364, 1925.

Hab.: Floating in water; evidently solitary filaments of the species found their way into the lake. Collected by Dr. Annandale on 10th September, 1914.

Family (*ii*) NOSTOCACEÆ.**11. *Anabæna torulosa* (Carmichael) Lagerheim.**

(Plate 28, Fig. 8.)

De-Toni, Syll. Alg. Myx., p. 455, 1907; L. Geitler and A. Pascher, Cyanophyceæ, Die Süßwasserflora Deutschlands, Osterreichs und der Schweiz, Heft 12, p. 328, 1925.

Trichomes 4–6 μ in diameter; sheath hyaline, mucous, diffuent; apex of tri-

chome gradually tapering ; apical cell sub-obtusely or sub-acutely conical, $4 \times 4 \mu$; cells barrel-shaped, equal or little shorter than the diameter, $4-6 \mu$ in width, $2-6 \mu$ in length ; cell wall distinct, pellucid ; cell contents granular, blue-green ; heterocysts $6 \times 6 \mu$, spherical in shape, intercalary ; gonidia $6-7 \mu$ in diameter, 12μ in length, somewhat cylindrical, contiguous to the heterocysts, slightly constricted in the centre, wall of gonidium smooth, contents granular, blue-green.

Hab. : Commonly found floating in water, after being detached from the water-plants, during winter, i.e. from November to March. Collected by Dr. Annandale from several places in the lake. This species can very well be designated the 'Winter annual' of the algal flora of the lake.

II. CHLOROPHYCEÆ.

Family (iii) ULVACEÆ.

12. *Enteromorpha intestinalis* (L) Greville.

Forma *cornucopiae* (Lyngb.) J. Ag.

(Plate 28, Fig. 9.)

De-Toni, Syll. Alg. Chlorophyceæ, Vol. I, pp. 123, 124, 1889 ; W. Heering, Chlorophyceæ 3, Die Süßwasserflora Deutschlands, Österreichs und der Schweiz, Heft 6, 1914 ; Kalipada Biswas, 'Flora of the Salt-Lakes', Jour. of the Department of Science, University of Calcutta, Vol. VIII, p. 31, 1926.

Plants attached to the substratum by a disc, never floating except when torn away from the substrata, $1-6$ cm., long ; deep green to yellowish-green ; fronds clavate, tubulose, often contorted more or less compressed, with the apices often perforated, branched, branches and branchlets shortly club-shaped, inflated towards the apex and tapering towards the base ; cells irregularly disposed, polyhedral by mutual pressure, oblong or sometimes spherical with broad intermediate cell-walls, about $10-14 \mu$ long, $6-10 \mu$ wide, the more or less rounded cells $8-10 \mu$ in diameter ; cells in the transverse section oblong, about 10μ in length and 8μ in width ; cell contents granular, with one nucleus and a parietal chloroplast.

Hab. : Growing profusely on rocks and boulders and sometimes on the filaments of *Lyngbya æstuarii* and fronds of *Gracilaria confervoides* often mixed up with *Enteromorpha compressa*. It is mainly these two *Enteromorphas* which on drying produce the concentric rings on boulders as shown in Plate 27, Fig. 2. Collected by Dr. Annandale and the writer at different seasons ; found in the lake throughout the year.

13. *Enteromorpha compressa* (L) Greville.

(Plate 28, Fig. 10.)

De-Toni, Syll. Alg. Chlo., Vol. I, p. 126, 1889 ; W. Heering, Chlorophyceæ 3, Die Süßwasserflora, Deutschlands, Österreichs und der Schweiz, Heft 6 ; p. 27, 1914.

Plant dull-green, membranaceous, about 5 to 20 cm., long, $2-5$ mm., broad, collapsing, simple or more or less branched towards the base ; fronds somewhat tubulose, linear, wedge-shaped gradually broader towards the apex ; apex obtusely rounded,

often perforated, margins of the collapsed frond nearly parallel to each other, not so lobed; cells minute, rounded but more commonly polygonal, oblong or subquadrate by mutual pressure, arranged irregularly, 10–20 μ long and 6–14 μ wide, narrow at the margin of the collapsed frond, intercellular spaces very much narrower than in the neighbouring species, cell contents granular, with one nucleus and a parietal chloroplast.

Hab.: Mixed up with *Enteromorpha intestinalis* and sometimes epiphytic on other algæ, grows profusely almost throughout the season on rocks and boulders. Collected by Dr. Annandale and the author.

Family (iv) CLADOPHORACEÆ.

14. *Chætomorpha Linum* (Muell) Kuetzing.

(Plate 29, Fig. 11; and Plate 30, Fig. 20.)

De-Toni, Syll. Alg. Chlo., Vol. I, p. 269, 1889; Kalipada Biswas, 'Flora of the Salt-Lakes, Calcutta', Jour. of the Department of Science, Calcutta University, Vol. VIII, pp. 29, 30, 1926; W. Heering, *Chætomorpha aërea* Kützing, *Forma Linum* (Küt.) Collins, Die Süßwasserflora, Deut., Öst. und der Schweiz, Chlo. 4, p. 16, 1921.

The Chilka form is not found floating in masses as it has been found in the salt-lakes; but the plant is larger and the cells vary from 125–210 μ in length and 125–140 μ in width, the cell walls especially of older filaments are densely lamellose and often fibrillose.

Hab.: Chilka Lake, floating with other algæ. Collected by Dr. Annandale in May, 1923, and on the 23rd September, 1924, as a constituent of the plankton.

15. *Cladophora glomerata* (L.) Kuetzing,

forma *callicoma* Rabenhorst.

(Plate 29, Figs. 12, 13; Plate 29, Figs. 14–17; and Plate 30, Fig. 18.)

De-Toni, Syll. Alg. Chlo., Vol. I, p. 295, 1889; W. Heering, Die Süßwasserflora, Deutschlands, Österreichs und der Schweiz, Chlo. 4, Heft 7, pp. 35–39, 1914.

Thallus attached to rocks, stone, boulders or other solid substrata by means of a branched rhizoid, usually 5–16 cm., long, much branched, attached to the substratum throughout its life, sometimes torn off by the waves and floating on the surface, rarely free-swimming; green to slightly yellowish-green in colour; more or less contorted, plumosely branched; branches connate at the base, feather-like, sometimes curved inwards towards the upper part, branches parietal forming an angle of 35–45°, branchlets many and are of several orders, the older branches sometimes falsely dichotomous or trichotomous; the primary branch varying from 60–125 μ in diameter, the intermediate branches from 25–75 μ and the apical branches from 20–35 μ to 40 μ ; cells 40–50 times longer than the diameter; cell membrane thick, fibrillose; apical cells obtusely rounded, sometimes obtusely conical, rarely truncate; cell contents sparsely granular, full of large starch granules of elliptical shape.

Hab.: Growing profusely on rocks and boulders throughout the season, when dried becoming white. Collected by Dr. Annandale and the writer from various parts of the lake.

Family (v) PITHOPHORACEÆ.

16. *Pithophora œdogonia* (Mont.) Wittrock.

(Plate 30, Fig. 19.)

De-Toni, Syll. Alg. Chlo., Vol. I, p. 386, 1889; W. Heering, Die Süßwasserflora Deutschlands, Österreichs und der Schweiz, Chlo. 4, Heft 7, p. 62, 1914.

Plants thin, elongate; filaments 50–70 μ in diameter; branches one to three, rarely of more orders; cells very long, about 5–20 times longer than the diameter; akinetes intercalary or apical, about 114–130 μ in width and about 200 μ to 230 μ in length, orculiform, the terminal ones subconical rounded at the apex.

Hab.: In a pond in Barkuda island. Collected by Dr. Annandale on the 22nd September, 1914.

Besides these green and blue-green algæ there are a few species of *Spirogyra*, some of which have been found in a very healthy condition, but all of them are without zygotes. Moreover, only a few fragments have been preserved; hence it is not possible to determine them from their vegetative characters alone. A species of *Ulothrix* has also been met with, but the specimen is too poorly preserved for identification. Fragments of species of *Oscillatoria* are not very uncommon but are also insufficient for identification.

III. RHODOPHYCEÆ.

Family (vi) SPHÆROCOCCACEÆ.

17. *Gracilaria lichenoides* (L.) Harvey.

(Plate 31, Figs. 24–27.)

De-Toni, Syll. Alg. Floridæ, Vol. II, pp. 430–431, 1900.

Fronds furnished with a foot-like radical hold-fast, rounded, cæspitose, sparsely branched, subcorymbose, with feather-like branches, gradually tapering towards the apex, more or less sloping down irregularly; branches elongated, gradually attenuate towards the ends, primary branches sparsely emitting branches in their lower part, branches and branchlets on the upper parts equally thick, apparently dichotomous, the smaller branches and branchlets always divergent, the younger ones thicker at the base, and tapering to acute apex; colour greenish-purple; the plant tough and somewhat cartilaginous; cystocarps projecting, hemispherical, borne on branchlets 2–3 cm. long.

Hab.: On rocks and boulders, not very common; also reported from Ceylon and Java. Collected by Dr. Annandale and the author from various parts of the lake.

18. *Gracilaria confervoides* (L.) Greville.

(Plate 30, Figs. 21–23; and Plate 31, Figs. 28–31.)

De-Toni, Syll. Alg. Floridæ, Vol. II, pp. 431–432, 1900.

Fronds with many shield-shaped holdfasts at the base, elongated, variable in length, about 15–35 cm. long, flagelliform; the primary branches pinnately featherlike branched, the lateral branches sometimes undivided, partly unbranched towards the upper parts, long, whiplike, thin, rounded at the apex; main branches furnished with smaller branches below, towards the top supplied with simpler branch-

lets; the branchlets often very long and narrow, flagelliform gradually attenuated at both ends, the branches and branchlets irregularly arranged, never dichotomous or divaricate or furcate, the angles varying from 30–45°; cystocarps on long branches or branchlets, numerous, hemispherical, about equal in diameter to the fronds; tetraspores embedded in shorter and thicker branches and branchlets; substance fleshy, somewhat cartilaginous; colour deep or pale purple.

Hab.: Quite abundant, growing on rocks and boulders. There is another very narrow form of the above species which is rather rare, and often mixed up with the stouter forms of *Gracilaria confervoides*. Collected by Dr. Annandale and the author from various parts of the lake.

Family (vii) RHODOMELACEÆ.

19. Polysiphonia sertularioides (Grat.) J. Ag.

(Plate 31, Figs. 38, 39; and Plate 32, Fig. 40.)

De-Toni, Syll. Alg. Florideæ, Vol. III, pp. 870-871, 1903.

Plant mass cæspitose, fastigate, more or less hemispherical, 2–8 cm. in height, lubricose; filaments long, erect, very thin and narrow, younger lateral branches and branchlets often produced pseudo-dichotomously; branches sparse, placed at an angle of 35 to 45°, somewhat pennicillate; the younger filaments and filaments bearing tetrasporangia furnished with numerous groups of penicillate branchlets with long flagella ending acuminate and arising from original branches and apical region of smaller branches; cells almost isodiametrical or sometimes 2–3 times longer than the diameter, about 50–135 μ long and 25–125 μ wide; cells of younger branches varying from 25–50 μ in diameter and gradually becoming shorter than the diameter towards the apices; branches with 4 siphons all along, tetragonous in transverse section with 4 pericentral siphons; colour variable from olive-red to deep purple; plants adhering to the paper when mounted.

Hab.: On rocks, sticks or other objects attached to them with thin foot. Collected by Dr. Annandale and the author.

20. Polysiphonia subtilissima Mont.

(Plate 31, Figs. 32–37.)

De-Toni, Syll. Alg. Florideæ, Vol. III, pp. 874-875, 1903.

Plants densely fascicled, cæspitose, 5–10 cm. long, filaments elongated, thin, narrow; primary branches decumbent, intricate, root-like at the base, with secondary branches somewhat erect towards the upper parts, articulated all along without any cortical cells; branches rather short, more or less dichotomous, towards the lower parts more or less simple or dichotomous fasciculate or fastigated, superior ones virgate; cells in the primary branches twice as long as broad, about 50–60 μ broad and 100–125 μ long, the younger cells at the apices 25–50 μ in width, average dimension of cells of intermediate branches and branchlets 75–135 μ long, 20–125 μ broad; cells gradually shorter towards the tips, the terminal siphon more or less wedge-shaped, about 12 μ long and 10 μ in diameter; tetragonous in transverse section with

4 pericentral siphons; tetraspores immersed in inflated cells often abundant a few cells below the apices in fertile shorts, tetrahedral in form about $25\ \mu$ in diameter, seriate in filaments appearing moniliform; colour blackish-purple, when dried not very much attached to paper.

Hab.: Throughout the year, growing profusely on rocks, boulders and sticks and sometimes epiphytic on larger algæ such as *Gracilaria confervoides*, *Lynghya æstuarii* and others. Collected by Dr. Annandale and the author.

Family (viii) CERAMIACEÆ.

21. *Ceramium elegans* Ducl.

(Plate 32, Figs. 41-45; and Plate 32, Fig. 46.)

De-Toni, Syll. Alga. Floridæ, Vol. III, pp. 1460-1461, 1903.

Fronds often up to 7 cm. long, more or less bristly or hair-like, with elongated rhizoid-like clasping organ developing on older filaments, regularly dichotomously branched; branches rather sparse, gradually attenuated; segments form an angle of $35-45$ or 60° with each other, the terminal pairs forceps-shaped; cells towards the lower parts in older and primary branches 2-5 times longer than the diameter, about $225-250\ \mu$ long and $50-85\ \mu$ wide, the upper cells are equal or shorter than the diameter; interstices of transverse zones at the joints somewhat pellucid, lateral walls sometimes fibrillose in older filaments with central elliptical granular portions; the transverse zones at the joints almost equal to or shorter than the diameter; tetrasporangia vertically arranged around the joints or girdle in subduplicate series, immersed fairly in the cortical layer.

Hab.: Near Barkuda island growing on rocks or sticks. Associated with the Polyzoon *Membranifera hippopus*. Collected together with plankton organisms on floating rocks and attached to sticks in March, 1924, by Dr. Annandale and the author.

Family (ix) GRATELOUPIACEÆ.

22. *Grateloupia filicina* (Wulf.) Ag.

(Plate 32, Figs. 47-54.)

De-Toni, Syll. Alga. Floridæ, Vol. IV, pp. 1563-1565, 1905.

Fronds compressed with a shield-like flat foot, the older specimens as long as 25 cm., linear, attenuated at the both ends; pinnately branched at the base, often naked at the apices, sometimes slightly bifurcate at the tips, with the margins beset with acute proliferations; branches long, linear, tapering towards the apex, ending acuminate into a sharp point or bifurcate, about 2 mm., in diameter; cystocarps discoid, numerous, embedded in the thallus, close to one another; tetrasporangia immersed in the branchlets, often crowded; colour purple near the base, gradually becoming violet and merging into green to yellowish-green at the tips.

Hab.: Growing on rocks and boulders on the vertical face submerged in the water throughout the season; very common, and luxurious in its growth especially during the monsoon rains. Collected by Dr. Annandale and the author from various parts of the lake.

Herbarium,

Royal Botanic Garden, Calcutta.

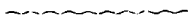
LITERATURE CONSULTED

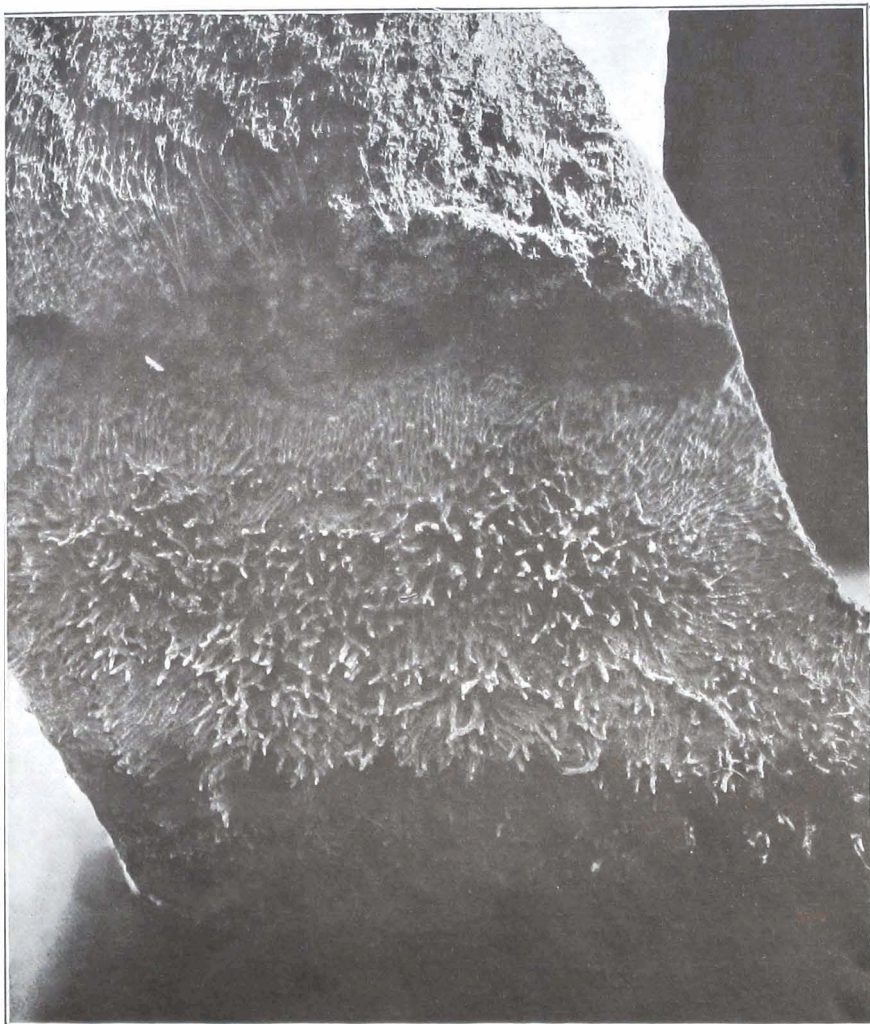
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Association of Algæ with Sponge-growing on a piece of rock.
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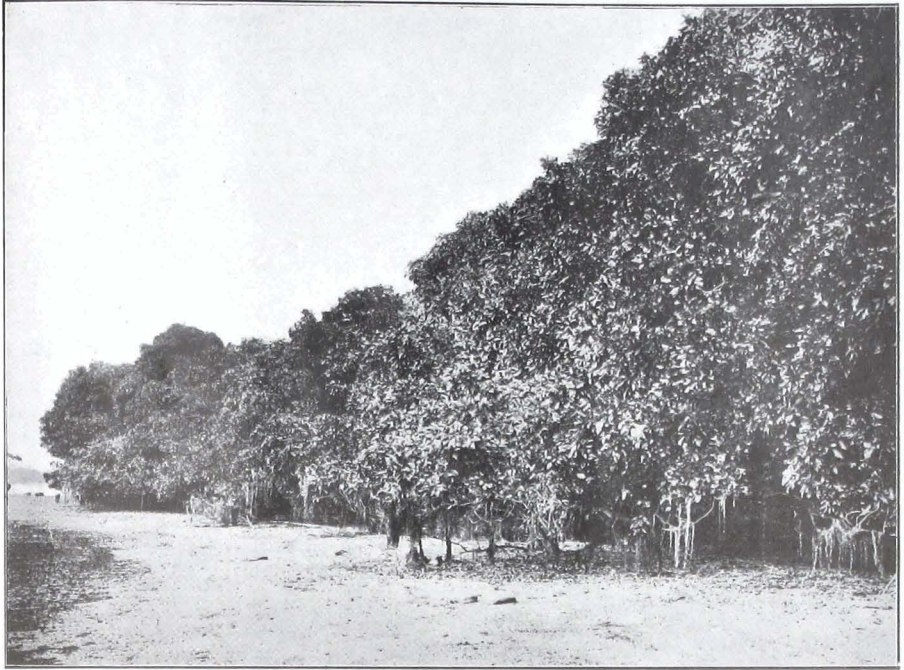


FIG. 1. The zone of *Pongamia glabra* on the northern side of the island with dead algae and *Potamogeton pectinatus* hanging from their lower branches where they have been left by the retreating floods.



FIG. 2. Fore-shore near Barkul with spreading sheets of dried algae.

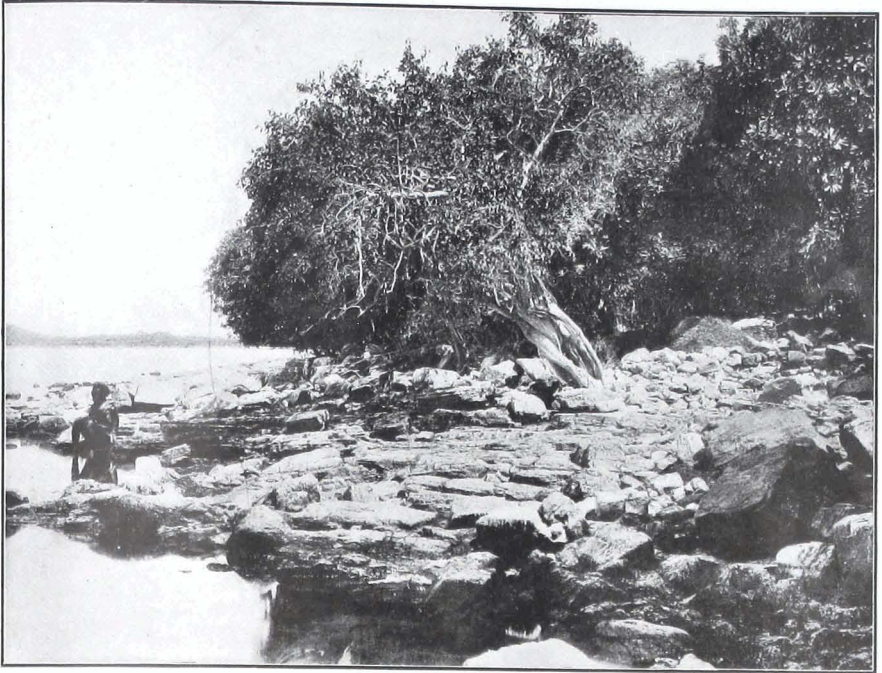


FIG. 1. A view of the north-west corner of the island with dead masses of algae (species of *Gracilaria* and *Enteromorpha*) attached to the rocks.

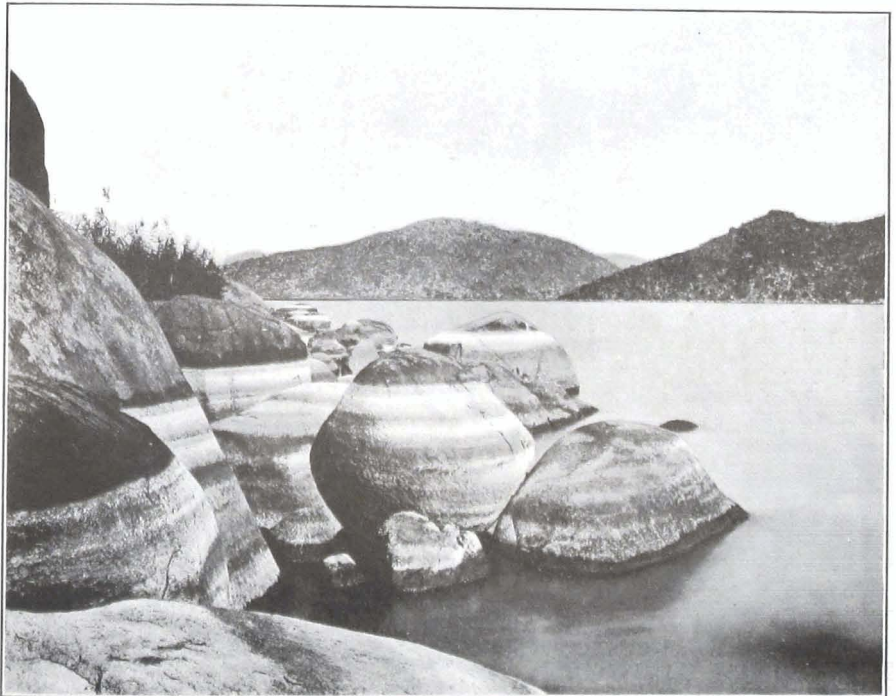


FIG. 2. Rocks and boulders near Patsahnipur with concentric rings of algae near the base and a bush of *Phragmites Karha* among the rocks.

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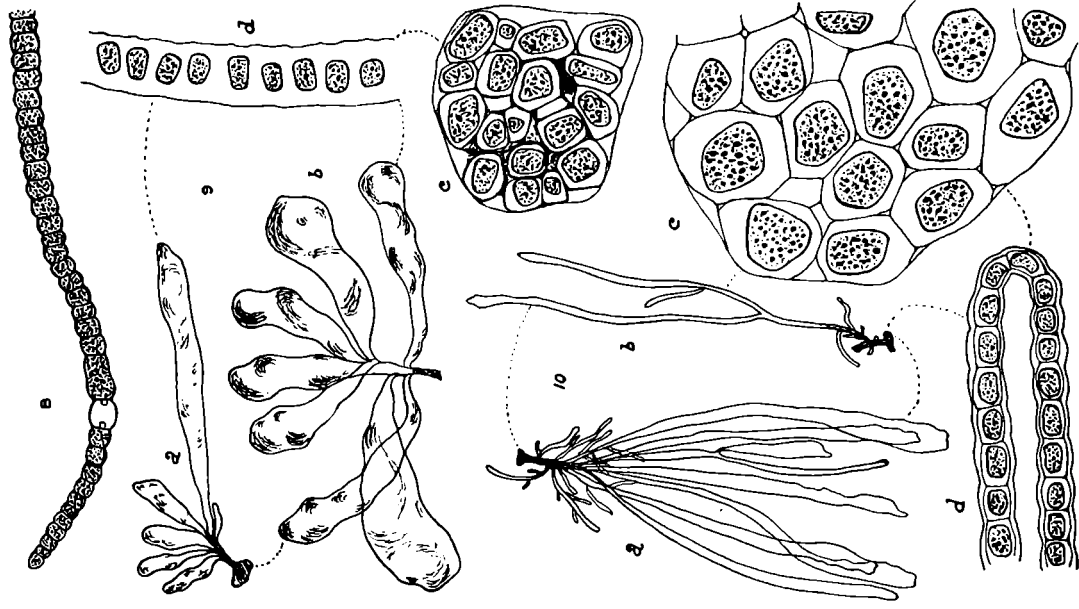
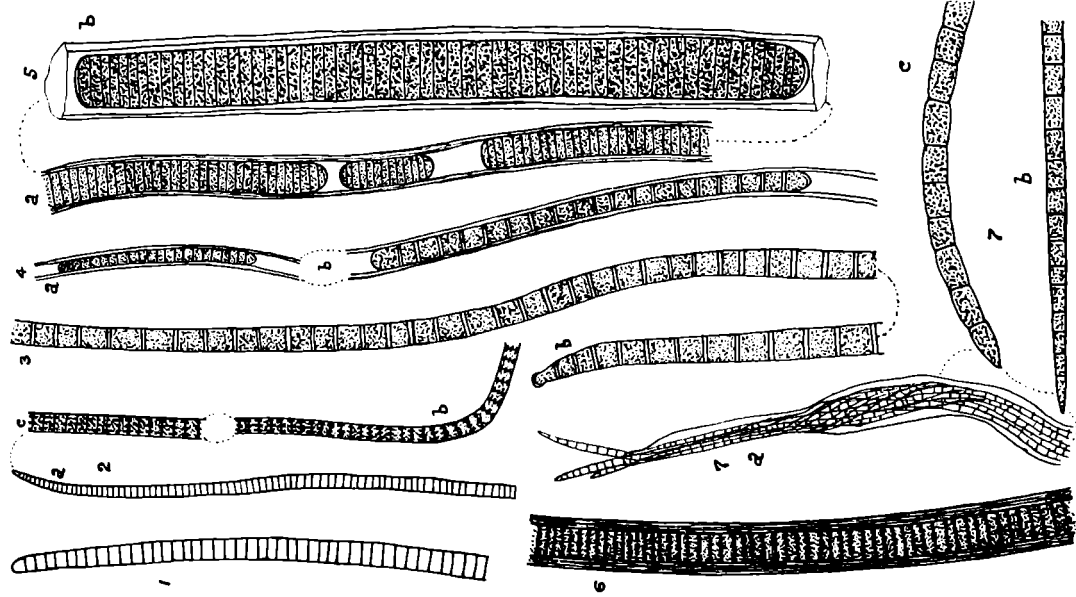
EXPLANATION OF FIGURES.

PLATE 28 (I).

- FIG. 1. *OSCILLATORIA CHILKENSIS*, $\times 1000$.
- FIG. 2. *OSCILLATORIA L.ETEVIRENS*, var. *minima* :
(a) part of the filament, $\times 800$;
(b) part of the filament, $\times 1000$;
(c) part of the filament, $\times 1500$.
- FIG. 3. *PHORMIDIUM SUBMEMBRANACEUM* :
(a) part of the filament, $\times 850$;
(b) apical portion of the filament, $\times 850$.
- FIG. 4. *LYNGBYA AERUGINEO-CÆRULEA* :
(a) part of the filament, $\times 600$;
(b) part of the filament, $\times 750$.
- FIG. 5. *LYNGBYA ÆSTUARII* :
(a) younger filament, $\times 500$;
(b) older filament, $\times 1000$.
- FIG. 6. *LYNGBYA CONFEROIDES*, $\times 300$.
- FIG. 7. *MICROCOLEUS CHTHONOPLASTES* :
(a) a single filament, $\times 160$;
(b) trichome, $\times 750$;
(c) trichome, $\times 1000$.

PLATE 28 (II).

- FIG. 8. *ANABÆNA TORULOSA*, $\times 750$.
- FIG. 9. *ENTEROMORPHA INTESTINALIS*, var. *CORNUCOPÆ* :
(a) a young plant, natural size ;
(b) an older plant, natural size ;
(c) cells of the part of the frond, $\times 500$;
(d) transverse section through the frond, $\times 300$.
- FIG. 10. *ENTEROMORPHA COMPRESSA* :
(a) a plant, natural size ;
(b) part of the plant showing the branching, natural size ;
(c) cells of the part of the frond, $\times 1000$;
(d) transverse section of the frond, $\times 350$.



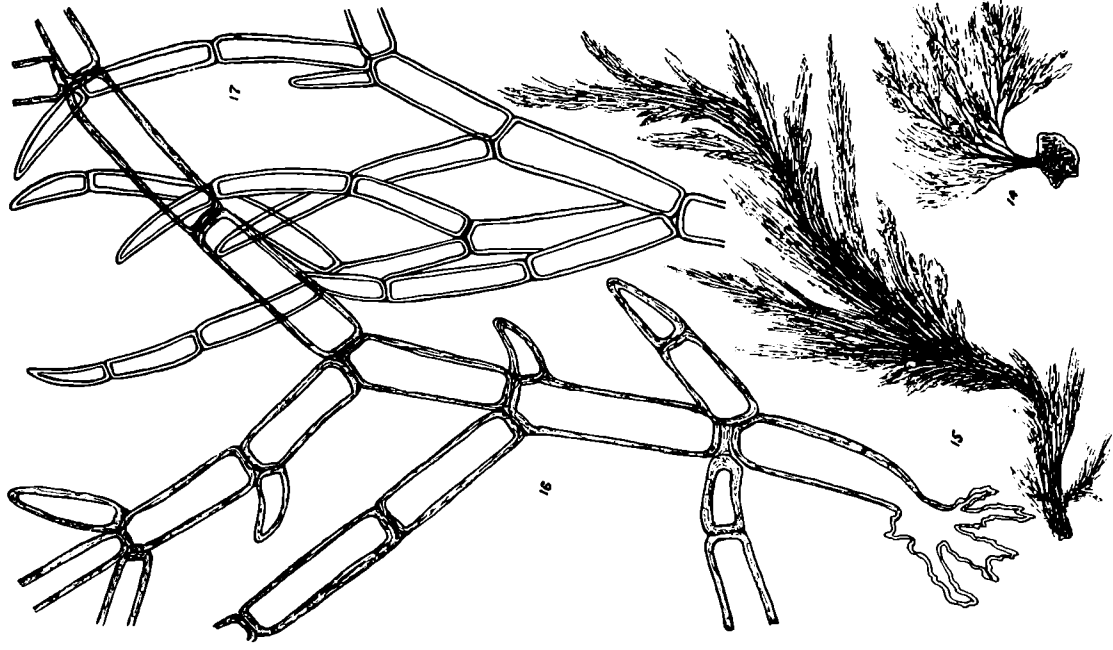
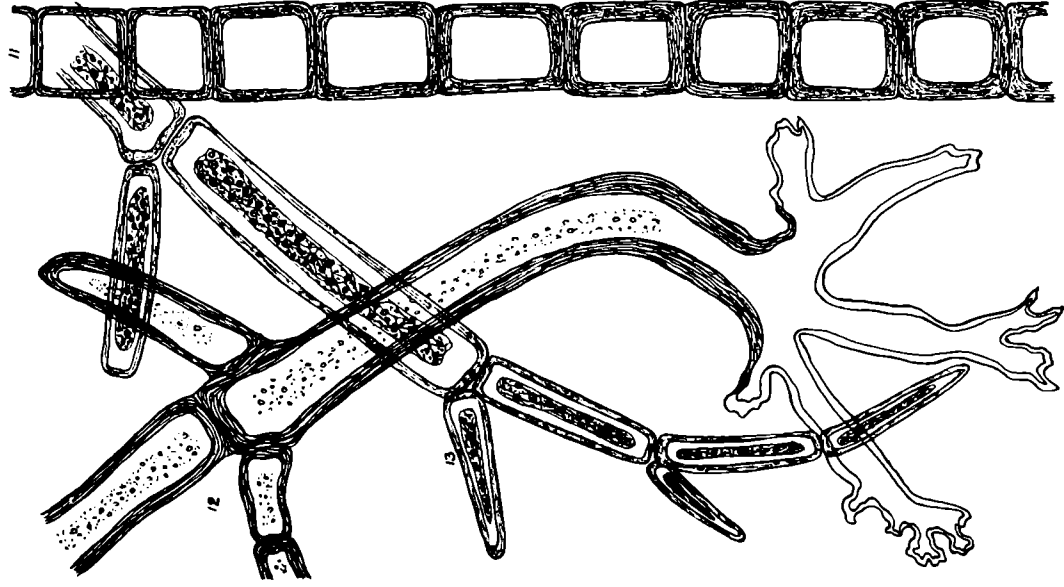
EXPLANATION OF FIGURES.

PLATE 29 (I).

- FIG. 11. CHÆTOMORPHA LINUM, $\times 150$.
FIG. 12. CLADOPHERA GLOMERATA, forma callicoma, basal portion with rhizoid-like clasping organ, $\times 200$.
FIG. 13. CLADOPHERA GLOMERATA, forma callicoma, part of the apical portion of the branches with partly contracted cell contents, $\times 300$.

PLATE 29 (II).

- FIG. 14. CLADOPHERA GLOMERATA, forma callicoma, a young plant, natural size.
FIG. 15. CLADOPHERA GLOMERATA, forma callicoma, an older plant, natural size.
FIG. 16. CLADOPHERA GLOMERATA, forma callicoma, basal portion of a younger plant with the rhizoidal portion and basal branching, $\times 150$.
FIG. 17. CLADOPHERA GLOMERATA, forma callicoma, upper part of the plant showing the branching, $\times 100$.



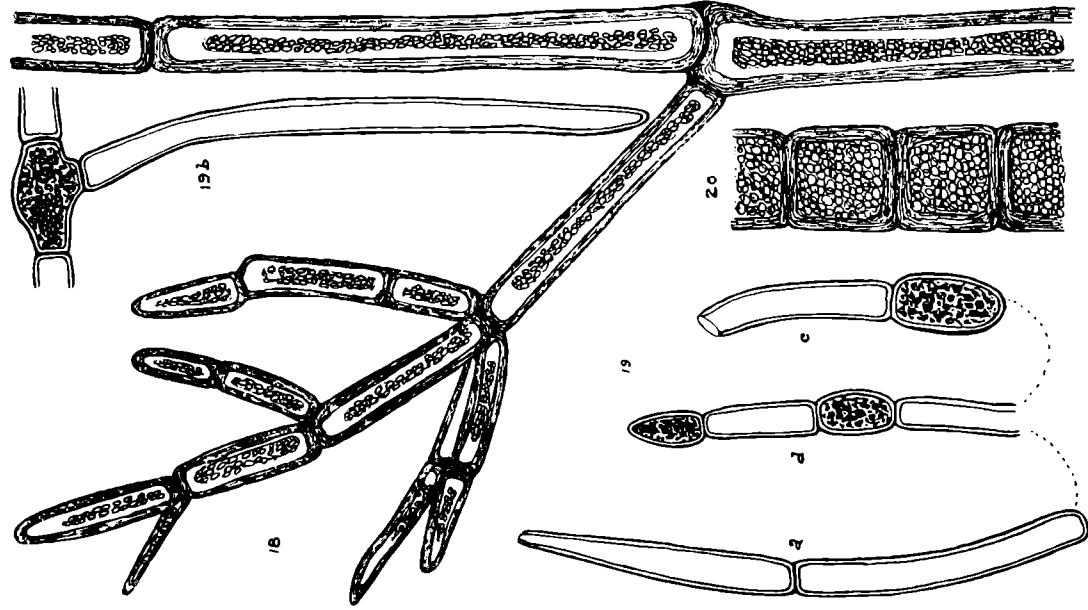
EXPLANATION OF FIGURES.

PLATE 30 (I).

- FIG. 18. *CLADOPHERA GLOMERATA*, forma *callicoma*, part of plant with another form of branching with cell contents consisting mostly of starch grains, $\times 100$.
- FIG. 19. *PITHOPHORA OEOGONIA* :
- (a) ordinary cells, $\times 100$;
 - (b) part of the filament with a branched cell and akinete, $\times 150$;
 - (c) part of the filament with an intermediate akinete, $\times 100$;
 - (d) part of the filament with apical and intermediate akinetes, $\times 100$.
- FIG. 20. *CHÆTOMORPHA LINUM*, cell with contents, $\times 150$.

PLATE 30 (II).

- FIG. 21. *GRACILARIA CONFERVOIDES*, natural size.
- FIG. 22. *GRACILARIA CONFERVOIDES*, a fruiting specimen, natural size.
- FIG. 23. *GRACILARIA CONFERVOIDES*, part of the filament with a cystocarp, $\times 5$.



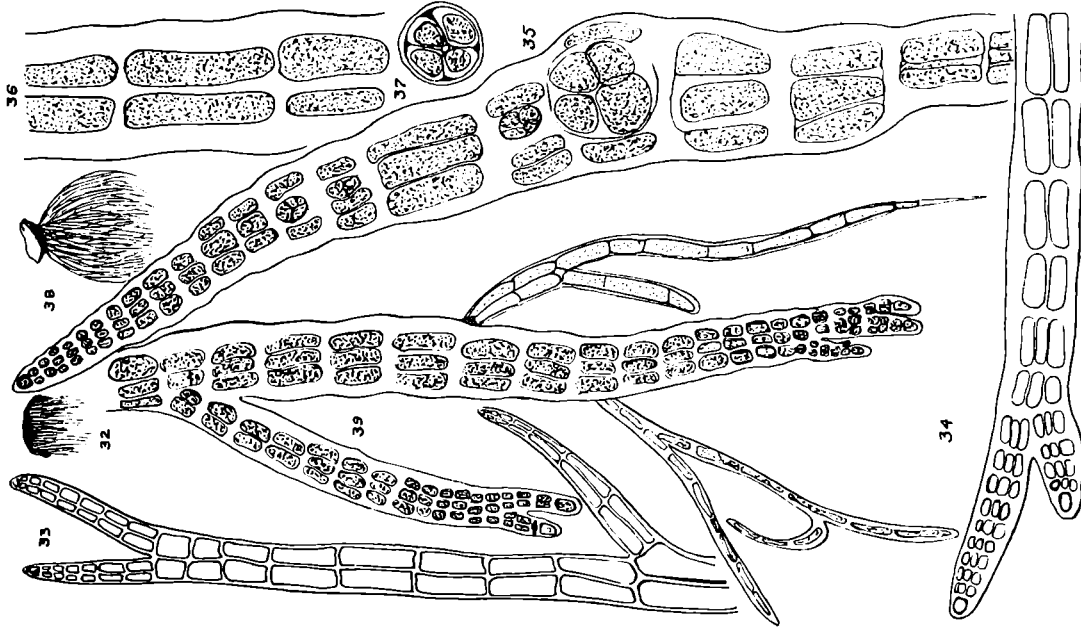
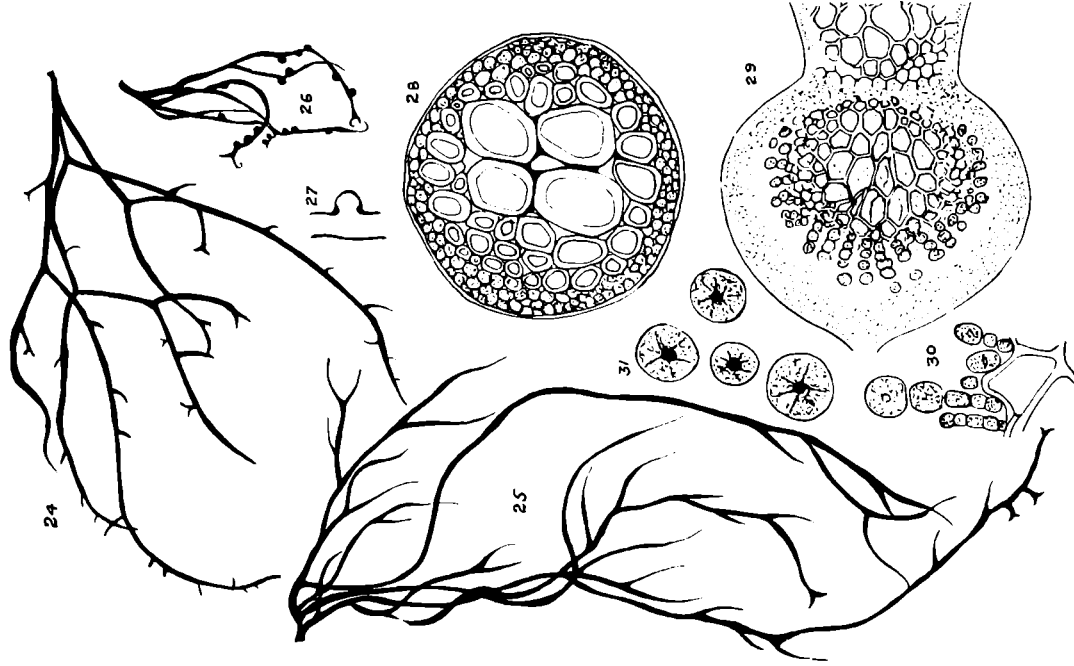
EXPLANATION OF FIGURES.

PLATE 31 (I).

- FIG. 24-25. *GRACILARIA LICHENOIDES*, natural size.
FIG. 26. *GRACILARIA LICHENOIDES*, a small fruiting specimen, natural size.
FIG. 27. *GRACILARIA LICHENOIDES*, part of the filament with a cystocarp, $\times 3$.
FIG. 28. Transverse section through the frond of *GRACILARIA CONFEROIDES*, $\times 100$.
FIG. 29. Transverse section through the cystocarp of *GRACILARIA CONFEROIDES*, $\times 100$.
FIG. 30. Fragments of completely developed cystocarp of *GRACILARIA CONFEROIDES*, $\times 250$.
FIG. 31. Mature spores of *GRACILARIA CONFEROIDES*, $\times 400$.

PLATE 31 (II).

- FIG. 32. *POLYSIPHONIA SUBTILISSIMA*, $\frac{1}{2}$ natural size.
FIG. 33. *POLYSIPHONIA SUBTILISSIMA*, part of the frond, $\times 150$.
FIG. 34. *POLYSIPHONIA SUBTILISSIMA*, part of the frond, $\times 250$.
FIG. 35. *POLYSIPHONIA SUBTILISSIMA*, part of the frond with cystocarp, $\times 250$.
FIG. 36. *POLYSIPHONIA SUBTILISSIMA*, part of the frond, $\times 450$.
FIG. 37. Transverse section through the frond, $\times 350$.
FIG. 38. *POLYSIPHONIA SERTULARIOIDES*, $\frac{1}{2}$ natural size.
FIG. 39. *POLYSIPHONIA SERTULARIOIDES*, part of the frond, $\times 200$.



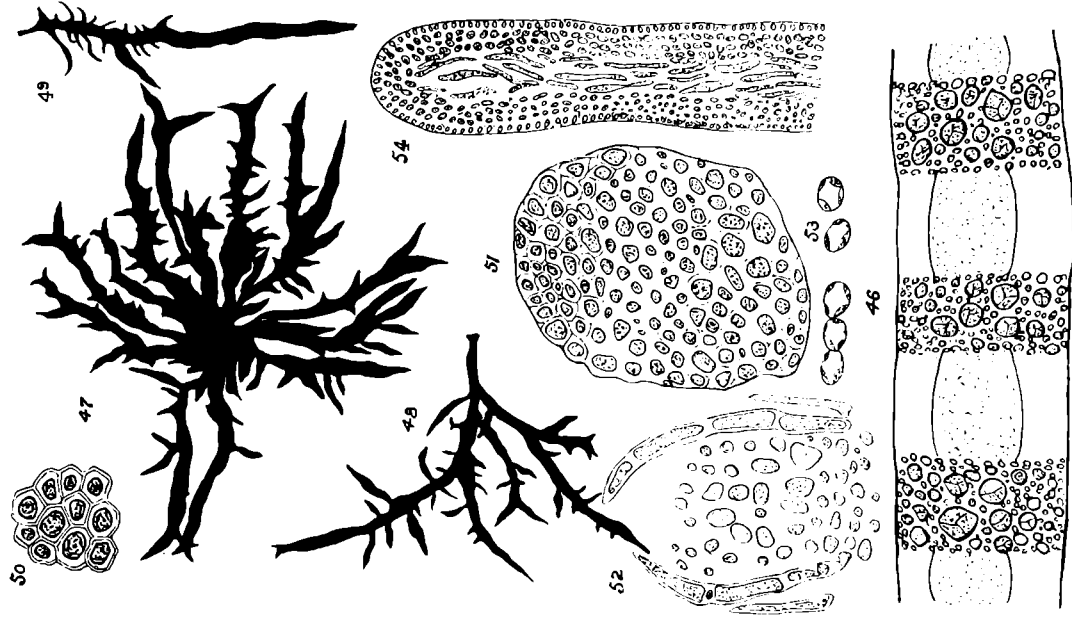
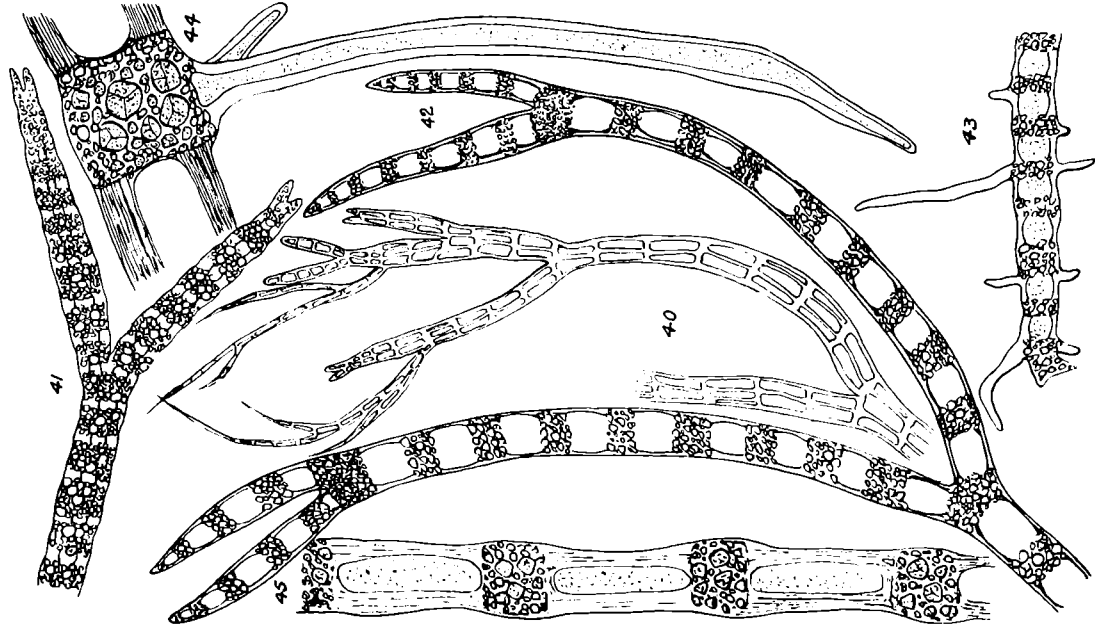
EXPLANATION OF FIGURES.

PLATE 32 (I).

- FIG. 40. *POLYSIPHONIA SERTULARIOIDES*. part of the frond, $\times 100$;
FIG. 41. *CERAMIMUM ELEGANS*, upper part of the young frond, $\times 150$;
FIG. 42. Part of the frond of an older plant, $\times 125$;
FIG. 43. Part of the frond from the base, $\times 125$;
FIG. 44. Part of the frond with hold-fasts, $\times 700$;
FIG. 45. Part of an older filament, $\times 140$.

PLATE 32 (II).

- FIG. 46. *CERAMIMUM ELEGANS*, part of the older frond with tetraspores, $\times 350$.
FIG. 47-48. *GRATELOUPIA FILICINA*, a young plant, natural size.
FIG. 49. Part of the frond of a young plant of *GRATELOUPIA FILICINA*, natural size.
FIG. 50. Part of the surface layer of cells of the frond of *GRATELOUPIA FILICINA* showing the surrounding layer of cells, $\times 500$.
FIG. 51. Part of the superficial layer of a portion of the frond of *GRATELOUPIA FILICINA* showing the general arrangement of the cells, $\times 400$.
FIG. 52. Part of the marginal cells surrounded by filamentous structure of which the central portion of the frond of *GRATELOUPIA FILICINA* is composed of.
FIG. 53. Five larger cells of *GRATELOUPIA FILICINA* with characteristic chromatophores, $\times 600$.
FIG. 54. Transverse section through the frond, $\times 250$.



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