

SANDSTONE.

The structure of this rock is very various, although its sole mineral constituent is quartz. It forms the whole of the red hill near Cairo, where it may be studied with great advantage. In some parts it is a light yellow sand, in others a hard black rock, in others a conglomerate, in another a compact white quartz rock; and frequently it has a red tinge. The brown Egyptian pebbles belong to one of its conglomerate forms.

The well known fossil trees lie in this sandstone, which is found overlying the yellow limestone throughout the desert.

The stratification of the red hill at Cairo is horizontal, but in the centre of it there is a white quartz rock, which is extensively quarried. At first sight this quartz rock appears an immense eruptive mass; but, on nearer approach, it is found to contain rolled pebbles; the lines of which are continued into softer sandstones, which lie against the quartz rock as a mound of earth thrown up against a wall. There can then be no doubt but that the whole extent of each of these lines of pebbles has been deposited at the same time; consequently the softer portions are the deposition in its original state, and the original sand has then undergone some action, in a vertical direction, which has metamorphosed vertical portions into a compact quartz rock.

No shells or fossils of any kind, but silicified wood, could be discovered in any locality of this sandstone, which I examined carefully for some distance south-wards of Cairo, as well as along and about the road from Cairo to Suez.

The superposition of this sandstone upon the yellow limestone is very easily seen, on the angle of the hill towards Cairo, by clearing away the rubbish a little. A little spur from the main hill is capped by the black sandstone; under this is the salt and gypsum deposit; and then come the upper beds of the limestone in their descending order. The same may be traced, although not with equal facility, all around the western base of the hill.

The superposition may be also easily seen, under the hills which appear to the northeast of the middle station, at the locality where I found so rich a bed of *pectens* and *scutellæ*.

Along the usual road to the fossil forest, this sandstone lies in such a manner, at the base of the hills, as to have the appearance of a dyke burst

through the limestones. Its structure however, the geological character of the red hill, and every positive evidence which can be alledged as to its nature, prove that it cannot be of volcanic origin as has been supposed by travellers.

The red hill contains no fossils of any kind, but the sandstone of the same character, near the middle station, contains fragments of trees; and all the trees of the fossil forest lie in a sand of the same description.

It is necessary to recollect that the stratification of the limestone is undulatory, and the surface of the whole country is therefore naturally diversified with alternate elevations and depressions, which may be easily traced by the eye, in this barren land, however much the sides of the elevations may be worn into cliffs by the torrents. At the extreme height of these elevations, fragments of the hard black sandstone and of fossil wood are almost always to be found. The lowest depressions are filled to some depth with sand, in which lie the trees which are so generally visited. This sand differs in nothing from the sand of the red hill. It frequently abounds with brown pebbles, which are often carried away and are well known as Egyptian pebbles. Around the trees, the sand is frequently of a red colour; and, a few inches below the surface, was quite moist in March, after rains had fallen about a month previously.

The trees are silicified, and have entirely lost all structure except the external shape of the tree, and some appearance of concentric rings. The trunks are of great length; and the measurements of those taken were 52, 57, 65, and 68 feet. Their girth is hardly proportionate; as trees of 52 and those of 68 feet were each only eighteen inches diameter. Knots are rare upon the trunks, and still less frequently are branches to be found. Those however, which do occur, are quite sufficient to prove that these trees belong neither to the *Palmæ* nor to the *Conifera*.

The trunks are divided transversely into segments; so, that it would be impossible to stir one from its position except in fragments.

The trees are all prostrate, and lie in every direction of the compass. I am informed that some are to be found upright, but I doubt this. I was taken to one said to be upright, and having with me labourers to remove the sand, in order to ascertain in what soil the trees grew and the character of their roots, I had all the sand removed and the specimen sufficiently exposed. I thus discovered that it was the lower part of a trunk with the roots; but broken off about an equal distance from the

centre of the trunk, and forming in fact a circular base of about four feet radius to the trunk, just such a mass as an elm torn up in a high wind. This however proved that the tree is not a palm; for the roots of palms are mere clusters of long thin fibres, little better than the base of a mushroom; and the Egyptian fossil had the fine spreading thick roots of a modern forest tree. Further it was evident that the tree had not grown in the sand in which it was standing, for if it had, the roots would not, as they were, have been broken. The conclusion unavoidably made was that it had been torn up by wind in some distant locality; and being carried thence by a stream was left astrand in the place where it is now to be seen.

I could discover no trace in the trees, of boring animals, as *solens*, &c. nor could I find any mark of barnacles upon them.

The trees are to be found in every undenuded spot between Cairo and Suez, and also may be traced I understand as far as Thebes: so that there is every reason to believe this sandstone formation has covered the yellow limestone in the vast rectangular space comprised between the Delta, the Nile, the parallel of Thebes and the Red Sea.

GENERAL CONSIDERATIONS.

The three formations above described constitute but one system, for although they are very distinct from each other yet they also pass easily one into the other. The white limestone is parted by beds of bituminous marle, which also parts the lower beds of the yellow limestone; and losing its bitumen and blackness, the marle becomes yellow and more aluminous, till the marles giving place to limestone, in which quartzose particles become more abundant, the limestone altogether disappears and gives place to sand entirely. In like manner there is a connection in organic remains. Dicotyledonous wood is found in the white limestone as well as in the sandstone. The nummulites gradually decrease in size from the lower beds of the white to the upper of the yellow limestone. The remains indeed of the white limestone are in general of larger proportions than those of the upper formation. For instance the *neritina grandis* is of immense dimensions for a *neritina*; and so also the crab large in proportion to its congeners. The *cardita intermedia* also seems to be larger in the lower than in the upper formations; yet the remains are all marine (except the bones and the wood), and the great proportion of shells are common

to both ; so that the same animals appear to have existed throughout, but in a decreasing temperature as the deposits were successively made ; if it be admitted that the same form of animal life inhabits larger bodies under higher temperature.

The animals are none of them inhabitants of deep sea. The crab belongs to a genus (*carpilus*) which frequents the sea shore, and so also does the *neritina*. But if any of the deposits were made in a deep sea we should suppose the deep white limestone was *that* one ; and certainly not the beds of the yellow limestone, which gradually and almost imperceptibly seem to have changed into sandy *dunes* where the tide or flood deposited the great trunks of trees on dry land uninhabited by any shell fish.

But I am inclined to believe that the ancient owners of the white limestone fossil did not dwell in the localities where we now find them. The white limestone is, in many localities, full of long tubes branching in all directions, which one can refer to nothing but the branching coral which is only found where the tide never exposes it to the atmosphere. The white limestone was therefore probably formed in deepish water ; but neither the *neritina* nor the crab could have lived in deep water, nor in a tangle of coral. The *neritina* more probably lived on the surface of rocks, and the crab used to lie in wait for his prey in their fissures, where he spread out his *great greedy pincers*, resting himself comfortably against the uneven sides of the rock clefts by help of the protuberances at the back of his test. But no such rocks could have existed here at a time when there was nothing but a loose floor of lime particles continually depositing. This was not the place then for them to have originally inhabited ; and in fact it seems to have been only their grave yard : for if they were not produced here, they must evidently have been buried.

The crabs are always uninjured in the quarries, every member remaining perfect. Now if a live crab is suddenly immersed in any thing which he does not like, he throws away some of his limbs : these crabs therefore must have died in a natural and easy manner. This may also be inferred from the natural manner in which they have folded up their pincers, and spread out their legs, and shut down their eyes in the sockets. As soon as a crab is dead, he is generally pounced upon and made a meal of by some wading bird or some other genus of the crab class ; a hole being thus picked in him and the specimen mutilated. Now that waders did

exist long before such a crab as this in the world is admitted, and therefore it is extremely improbable that such numbers as those in the Cairo quarries could have escaped a wader, even supposing that there was no species of carnivorous *bracyoura* or *macroura* in the neighbourhood, or that our crab was not of a cannibal disposition, both which suppositions are rather impossible. He must therefore have been quickly carried away from the place of death to his present locality. The agent which carried the crabs to the Cairo quarry, did not treat them with great gentleness, for all the specimens are much broken in the weaker parts, as the lower portions of the *carapace*; and this is to be observed in the shells of the *neritina* also. Lastly they must soon have been buried, for if not they would most probably have soon fallen to pieces, and certainly would have been knocked against one another and coral, and been much more seriously injured than they have been. The evidence appears therefore to be conclusive that the *neritina* and the crab inhabited rocky spots at a distance from Cairo, where they were carried by a current, and lime rapidly deposited around. This rapid deposition of lime may have been connected with a flow of bitumen at the bottom of the sea.

Every sea-shore is naturally divided into zoological districts according to the distribution of mud, sand, and rock, and according to depth of water. Wanderers are occasionally found straying out of their proper limits, but in general each species is restricted within very narrow bounds. The arrangement on a shore is sand, and then mud or clay. The sand is frequently composed almost entirely of shells. Now such is the order of the yellow limestone; for clay abounds at the bottom, sand at the top, and throughout the debris of shells has formed a limestone. Not that the shells are the exclusive source of all the limestone; for by some process or other, lime seems to have been disengaged from the waters of the sea, which added their quota to the deposits of limestone beds, and this deposition seems to have been the principal source of the whole beds. The series therefore indicates a gradual shallowing of the water, and consequently the vertical section, which the geologist now examines, tells him how the superficial surface of the ancient shore must have been mapped out, when the formative causes of the Egyptian limestone were narrowing the limits of the ancient sea. Beyond the limits where the large branching corals were rising in deep water above the lime, which precipitated around them, and was entombing the remains of crabs, *neritina*, and various mollusca, which a stray current drifted

among them, grew one of a genus of coral (*eschara*), whose modern types grow on rocks even under water, but generally exposed to strong currents. Beyond this was a bed of oysters. Next a bed of large turritted shells, much of the same character as the large *Proto* of our own coasts. Then crowds of *pleurotomæ*, associated with *cerithia*, apparently occupying much the position of the *cerithia* which abound both on our rocks, and in our mud, at such a low depth that they may often be exposed to the fresh air by the retiring tide. Lastly *pectens*, *scutellæ*, and *anomias* were washed on a shell beach from deeper positions. These are all shells of deepish water, and any one who has studied a modern beach, knows how constantly these large flat shells are washed on shore. We have already noticed that the *anomia* appears to have two localities; one is its beach or burying place, the other is its living locality; and we do not doubt but that more careful search will find deep sea localities for the *pectens* and *scutellæ*. Consequently we now see the following order of superposition: the upper strata of the yellow limestone is a shell beach, formed by the spring tides only, washing thereon more particularly the large flat *bivalves*; next, the strata of the beach left dry at ordinary tides, inhabited by *pleurotomæ* and *cerithia*. The next strata are parts of the coast left dry but for a short time, and inhabited by large *turritellæ*. Next an oyster bed, and next a bed of *anomias*, in deep water. Then a growth of coral, left uncovered only at spring tides, and then we come to deep water, where the tides washed many of the inhabitants of the coast regions.

I consider therefore the yellow limestone to have been the *habitat* of the primæval inhabitants of Egypt; and that the locality where the *neritina* and crab lived, will be probably found on the primitive rocks near Thebes, upon which the nummulitic limestone probably abuts.

The sea was continually retreating northwards from the neighbourhood of Thebes; and, as it shallowed, formed great salt pans, in which it deposited its salt, viz. common salt and sulphate of lime. Hence the upper beds of the formation abound in these minerals.

The origin of the sand and brown Egyptian pebbles, is probably to be sought in the mountains of upper Egypt or of Abyssinia: for following up the ideas ventured above, I should conclude that the *dunes* of sands have advanced from the south, following upon and filling up the salt marshes which the shallowing sea left.

The hard quartz rock, in the heart of the mound of sand now called the

Red Hill, may be the agglutination of the quartzose particles, by a silicious spring of warm water; and a similar spring may have formed the appearance of a dyke along the fossil forest road. Such springs moreover may have poured out hot water over the whole surface of the country and silicified the trunks of trees.

The existence of a potent subterraneous heat at that time is rendered probable by the large size of many of the fossils before noticed: for it does not seem possible to account for a heat in the sea, sufficient to silicify them except it were fed by hot springs. The dissemination of bitumen in the lower beds of the white limestone may be connected with this unusual heat.

Although we have then a sufficient agent to silicify the trees, we have a difficulty in bringing them to their locality. That they were silicified in their present positions appears from the fact, that of the silicifying *agent* having divided them transversely, and as they certainly did not grow there, they must then have been transferred by water. They could never have been submerged in a sea, where *solens* abounded, without having been penetrated by them, and they could not have remained on a sea beach for any length of time, where *balani*, and *flustra* attached themselves to *pectens* and other marine bodies, without being also incrustated more or less by the same animal. Yet it must have been a powerful current which transported such large trunks, and that current was not the current of a river: for we cannot imagine ever to have been on earth a river stream whose breadth is a measure from the Red Sea to the Nile at least. Moreover, there is no trace of a river action on the nummulitic limestone. The trunks must then have been swept from their place of growth by the ocean, and by a rapid flood which swiftly drove the *dunes* of sand, and debris of the ancient forests, over the salt pans and dry beaches of the retreating sea.

The sea must have been gradually retreating owing to the greater depths quickly filling up by a deposit of lime. Perhaps in twenty years it might have filled up from the parallel of Thebes to that of Cairo, while a mighty flood overthrew the forests of the ancient African continent, broke in pieces its eternal rocks, and drove the debris of all down into the vast extent of low salt marshes which the sea had left.

The circumstances of the crab prove an unusually rapid deposition of lime, and consequently an unusually rapid filling up of sea, and advance of the usual coast, in the usual manner, on the sea, until all was filled up,

and nothing left but salt marshes. The circumstances of the fossil wood prove a subsequent unusual sea flood, in short, a deluge.

Egypt was inhabited and a kingdom three hundred years after the deluge of Noah. A shorter time than this would have been sufficient to drain off the waters of the deluge, and by that drainage to have hollowed the valley of the Nile and formed its fertile plain. Our geological facts then perfectly agree with the Bible history ; for it is certain that a great flood was the last geological event in Egypt, and this affords additional evidence to the truth of the Bible record.

The nummulitic limestone, therefore, was in progress of formation a little before the flood, and might have commenced but a few years before. As it is clear that there was nothing miraculous or unusual in its formation, the length of time will entirely depend upon the amount of lime precipitated and the time requisite for this, and the time necessary for the multiplication of nummulites, of which creature the great mass of the stone is composed.

RELATION OF THE EGYPTIAN TO OTHER FORMATIONS.

If then Egypt has really afforded us the means of connecting history with geology, we have a fixed point to which we may endeavour to connect other formations, and thus perhaps, step by step, to trace back the history of our earth.

First. With regard to the nummulitic limestone. It is found in Cutch and Sindh, in Lombardy, and in the Grecian islands, and I believe also in Spain. In all these localities it has been referred either to the upper members of the chalk, to the tertiary, or to some intermediate formation between the secondary and tertiary series. Now, with regard to the chalk, it does seem, in its general character, to be a deposition of much the same character as we have found the lower nummulitic limestone, namely, a rapid deposition in a deep sea. And with regard to the marine tertiary strata, they seem to indicate the same changes as the upper nummulitic limestone of Egypt ; viz. the gradual recession of the sea from its shores. There are no doubt strong objections against the identification of the chalk with the lower nummulitic limestone and of the whole range of *eocene*, *meiocene*, and *pleiocene* formations with the upper beds ; and I merely wish to suggest the possibility of this view being correct.

With regard to the identification of the nummulitic limestone of India

with that of Egypt I have no doubt. In the description of fossils, several instances of the same being found both in Cutch and Sindh are specified. But I think that it would be premature to do more than to urge exertion in procuring more specimens from both Egypt and India for our Museum, and in collecting further facts; as we are in an admirable position between the two countries to establish the negative or affirmative of the assertion.

Having examined the nummulitic limestone about Verona, I feel no hesitation on the identification of the Lombardy with the Egyptian formation; but I am not able to refer to the work of the Italian Geologist who has described these formations. The nummulitic limestone of the Grecian Islands has been recently investigated by an English Geologist.

From the specimens brought from the great Sahara, by Captain Lyon, Dr. Buckland concluded that the greater part of the desert was an equivalent of the new red sandstone supporting patches of tertiary beds; and on the same grounds it has been generally imagined that the whole of that great salt bed, stretching from the Atlantic to the Himalaya, including the deserts of Africa, of Arabia, and of Persia, is new red sandstone. The accounts of travellers seem to establish the idea that they are all of the same character; and their geographical relations warrant the supposition, that this chain of salt desert has originated in the same geological events. The account above given of the salt and gypsum deposits shews, why Dr. Buckland erred in assigning so early an age as the new red sandstone to the desert formations; and Captain Lyon's specimens of tertiary shells were doubtless from the same nummulitic formation as the salt and gypsum. This extends the nummulitic limestone and the shallowing ante-diluvial sea to the Atlantic; and, again to the eastward of our researches, into Arabia and Persia, and thus connects the Egyptian directly with the Cutch *beds*, and with those of the Indus.

This great sea had then a southern boundary probably in the central mountains of Africa, or about the line of the Niger. Its northern boundary was the line of the Pyrenees, the Alps, the Balkan, the mountains of Armenia, and the central chain of India. The notices which have appeared of Mr. Murchison's investigations in Russia would, combined with our previous knowledge, seem to say that a great sea prevailed over northern Europe, so that the habitable continent, in ante-diluvial times, consisted of a long ridge from Cape Finisterre through Auvergne, Swit-

zerland, Hungary, on to central Asia. From the reported state of India itself, it would appear that it was then also a peninsula. The lakes and coal beds of the Nerbudda probably belonged to that period, and the fossils of Perim and of the Sevalik hills, prove the existence of large continental animals living in watery places: whilst on the other hand, the marine fossils at Mandoo on the one side, and on our East coast on the other side of the peninsula, prove that its dimensions were then much smaller than they now are.

It seems to me that we have then within the limits of our research, the possibility of mapping out and ascertaining the geography of the old world previous to the flood, and the nature of that great catastrophe. We may do much in India, to carry this into effect; and with the hopes of moving the spirit of research, which has been for years employed in unveiling the physical state of the peninsula, I offer these remarks. My theory may be quite wrong but it is drawn from many facts and is plausible. Let the whole country from the lakes, south of the Nerbudda to the Indus, and the deposits from the Ganges to Cape Comorin, be well examined; and India is likely to afford as valuable a contribution to the history of the whole peopling of the Earth in *præadimate* and *prædiluvial* times, as Egypt or Russia.

The fossils which I collected, together with contributions from Major Twemlow, Dr. Heddle, Mrs. Barr, Dr. Pigou, and Dr. Stevenson, are deposited in our Museum: and, as I can find leisure, I shall publish, lithographs * of these together with those from Sindh and Cutch which have not been already published.

CEPHALOPODA. *Clymene*. Pl. iv. fig. 1.

The genus *Clymene* is separated by Count Munster from the *Nautilus*, on account of the position of the syphon, which in this genus is ventral, in the *Nautilus* central, and in the *Ammonites* and *Goniates* dorsal.

Count Munster says, that he has not found this genus in any formation of later date than transition limestone. *Annales des Sciences*, August, 1834.

* The Society having kindly permitted me, I shall deposit these lithographs with the librarian at such a price as will cover the expense of publication. The limited means of the Society will not allow it to hazard the expense of the illustrative lithographs.

He enumerates 14 species, from all of which this differs in the *long* lateral lobes of the saddle-shaped chambers.

TRACHELOPODA. *Plates i. ii. iii.*

1. *Conus*. This very minute cast occurs in the yellow limestone.

2. *Tornatella*. From the same place. Its spire is more depressed than most genera of this species. But I can refer it to no other genus.

4. *Buccinum*. Spire turrited. Longitudinally striated. Yellow limestone.

5. *Buccinum*. Whorls rounded, cancellated by transverse and longitudinal striæ. Yellow limestone.

Cypræa depressa. I should not have identified the Egyptian specimen with the Cutch, had I not been favored by Mr. Leith with a specimen from Sindh, by which all doubts as to identification were removed.

7. *Buccinum*. A cast from the white limestone. It occurs also in Sindh; Mr. L.'s specimens. It is not unlike *Eburna spirata*.

6. *Eburna*. An internal cast from the white limestone. The aperture of this species is much narrower than that of the modern.

8. *Strombus*. White limestone.

12. *a, b. Murex Smithii*. The two specimens from Egypt, figured by me, agree with *Murex Smithii* in every respect, but the variety *a*, has a more elevated spire; the variety *b*, has a more depressed spire than *M. Smithii* as figured by Sowerby: *Plate d, lxxviii min. chon*. But according to that author, the species is very inconstant in this character; and this removes every objection to referring the Egyptian to this species which occurs in the London clay. The species of the London clay *molusca* appear to be very inconstant in their character. Indeed they have all much the appearance of hybrids. This *murex* has much the character of *pyrula spirillus*, (Lamarck) differing from it only in having three instead of two knotted bands on its whorls, so that it seems to be a connecting link between the two genera. Lamarck's definition would have classed it as a *pyrula*.

b. is a broken specimen shewing the interior, and also the tail which has marks of plicæ.

14. *Pyrula*. Upper strata of the yellow limestone. If this is not a cast of *pyrula verspertilio*, it is very closely allied to it.

13. *Turbinella*. If not *T. cornegera* it is closely allied to it. It is a

mere cast from the white limestone ; but it shows 4 strong internal plicæ and its oval turbinated shape is very marked as well as the narrowness of the aperture.

11. *Pleurotoma Egyptiaca*. The character of this shell approaches so much to more than one species of the London clay, that I unhesitatingly refer it to their alliance. But it has only a family likeness to those specimens which I possess. It is very abundant in one of the upper strata of the yellow limestone, the rock being almost composed of it and *cerithia*.

9. 10. *a, b. Cerithium tricarinatum*. I can discover no difference between the specimens of the *Cerithium tricarinatum* and the species which groups upon the Bombay high water rocks. This last is a most variable shell. It is sometimes very tapering, as the *C. tricarinatum* of the London clay. Sometimes very stumpy, as the *Buccinum granulatum* and propinquum of the crag. Sometimes it is without, and sometimes it has *highly developed* the peculiar expansion near the outer lip ; the extension of which up the spire gives the *cerithium* somewhat of the peculiarity of the *murex*. Hence I identify the two Egyptian specimens with our Bombay species and that with the *terithium tricarinatum* of the London clay and *Buccinum propinquum* of the crag.

Spec. Char. Turritted, transversely streaked, three rows of granules on each whorl.

17. *Turritella conoidea*. I refer the Egyptian to the London clay specimen, although it may not be the same. The Egyptian specimen is abundant in the yellow limestone, and its shape agrees better with *conoidea* than with *elongata*. Although Mr. Sowerby expresses much doubt as to the accuracy of the distinctions received between the species, yet there can be no doubt that the Egyptian specimen must be classed with the *conoidea* and *elongata*, to whichever of the two it may be referred. My specimens agree better with the *conoidea*. It is difficult to get a view of the outer shell, but from the one figured at *b*, it appears that the whorl has 7 principal *striæ* and there may have been other smaller *striæ*.

16. *Turritella Egyptiaca*. Abundant in one of the middle strata in the yellow limestone. It is much like *T. assimilis* of Cutch, but differs in the number of threads, which in my specimens are uniformly four in the upper, increasing to five lower whorls. The angle at which the whorls taper is by no means uniform. It is frequently a very blunt shell.

18. *Cirrus*. A common internal cast in the yellow limestone. But it

is quite vain to decide even upon its genus until a cast or specimen of the exterior is found; for the genera of *cirrus*, *euomphalus*, and many of the *turbos*, appear to have internal casts exactly alike. The globulus (Grant's Cutch, pl. XXVI. fig. 4.) I conceive to be the same: for I found a great variety of casts in character passing into one another, from figs. 21 to 18. I am much inclined to refer fig. 20 to the same species, although this may be a young *ampullaria*.

19. *Ampullaria*. A cast from the yellow limestone.

15. *Neritina grandis*. The figure of this by Sowerby, in Col. Grant's paper on the Geology of Cutch, might have been supposed to have been taken from one of my Egyptian specimens. If I had any doubts of their identity, they must have been altogether removed by a series of specimens brought by Dr. Leith from Sindh.

As an unpracticed conchologist would hardly imagine the internal cast to be that of a *neritina*, I have given it in a different view from that in the geological transactions fig. *a*.

My specimens supply the characters hitherto deficient. The shell is very thin and patelloid in shape, the right border is crenulated, and the spire is almost obliterated. The actual spire is just broken off in my specimens; but one of Dr. Leith's specimens has in it a simple dot. As it must have been the same from the curvatures of the horizontal *striae* which are uninjured in the Egyptian specimen, I have considered myself warranted in restoring it; and I have not thought it necessary to break away the rock, and run the risk of spoiling the specimen figured *b*. in order to prove the character of the spire. This figure is of the shell shewing the internal spire, and the smallness of this perfectly agrees with the vanishing spire on the Sindh specimens.

It is a very common fossil in the white limestone quarries near Cairo.

a. Internal cast of shell below.

b. Internal shell above.

b. Shell above.

GASTEROPODA.

1. *Laplysia*. I found some small fossils which I believe were the peculiar bodies which are found in the intestines of this genus.

2. *Bulla*.

3. *Calyptra Ægyptiaca*, Pl. iv. fig. 3.

CONCHIFERÆ, *Plates v, vi, vii.*1. *Anomia Placunoides Pl. vii.*

Flat valve. Opercula foramen, elliptic, extending to the margin.

Convex valve. Round, central, undivided, muscular impression. Two deep fossæ at the hinge, one large and the other small.

Shell very thick and large, composed of many pearly layers.

The shape of the shell is very irregular, but its normal figure appears circular. The convex valve has an external termination at the beak, very much like the hinge surface of an oyster shell.

It is to be found in great abundance, in the upper part of the yellow limestone, at the base of the Red Hill; and will be met with in a corresponding layer over various parts of the desert. Its locality near the Red Hill was pointed out to me by Mr. Malcolmson, before I went through Egypt. His specimens were without the hinge, and he consequently mistook the shell for a *Placuna*.

It is briefly noticed by Milne Edwards, in a note on the *Placuna*, and is regarded by him as a genus which connects that genus with *Anomia*, in a manner different from the connection which the new genus of *Placunanomia* has established.—Both *Placuna* and *Anomia* are too little known, for any very certain distinctions to be at present laid down.

2. *Ostræa gregarea Ægyptiaca.* The constant characters of this species are—1st, the absence of an ear; 2d the curvature of the shell is always towards the cicatrix; 3rd the upper valve generally flatter than the lower valve and never plaited. Its upper valve is generally very flat. The lower valve is plaited longitudinally, but the number of plaits is very uncertain. The plaits are sometimes furcated.

It differs from the *O. gregarea* (Pl. CXI min. Conch.) only in the latter having its upper valves plaited.

The *O. gregarea* is a crag shell.

Our species is abundant in one layer of the yellow limestone.

3. *Ostræa lingua Ægyptiaca.* This is a more rare species occurring with the *pectens* and *scutellæ* in the upper layers of the yellow limestone. It is much like *O. lingua* of the Cutch fossils.

4. *Pecten sulcatus.* Plate v. fig. 1. This occurs in all the nummulitic limestone of Egypt, but it is to be found in greatest abundance in the upper strata of the yellow limestone. It varies much in some characters.

One given to me by Mrs. Barr, is much broader than any which I preserved; but my specimens seem to differ in no respects from the *P. sulcatus* of the mineral conchology, which is a common crag fossil.

P. Somrowensis of Cutch appears to be the same as the above: for some of my worn specimens agree with it in surface, and the ratio of the transverse and longitudinal diameters varies so much that the difference, between my figure and that in the Geological Transactions, cannot be considered of consequence. My figure was drawn by Mr. W. Fallon.

Pecten Complanatus Pl. vi. If this is not *p. complanatus* of the mineral conchology, it is very closely allied to it. The only specimen which I have is very much worn and is fissured; it has a small coral attached to it. The ridges therefore which are described upon *complanatus*, may very possibly be worn away to the striæ, which may be seen on our specimen.

Complanatus is another crag fossil. The locality in Egypt is with *P. sulcatus* near the middle station.

6. *Mytilus Ægyptiacus* Pl. v. figs 7.

7. *Arca Ægyptiaca* Pl. v. fig 2.

8. *Nucula Baboensis* Plate v. 9. This is found also in the nummulitic limestone of Cutch.

Cardita Intermedia. Pl. v. fig. 4. I refer my specimen to this species on the authority of Mr. Sowerby, who, in describing *Cardium intermedium* (Geolog. Trans. 2 Series Vol. V. Tab. XXIV, fig. I,) says: "this shell, of which we have only casts, is very near in form to *Cardita intermedia* of Lamarck; the hinge as we learn from the impression, however, wants the long marginal tooth which marks the genus *cardita*." The cast (fig. c.) and the shape of the shell as given in fig. a, is exactly the same as the figure above referred to: so that there can be no doubt as to the identity of the Cutch and the Egyptian fossil. But one of my specimens has the impression of the long marginal tooth; so that there can be no doubt of its generic character.

The absence of all evidence to the existence of the long marginal tooth does not seem to be of so much consequence: for M. Agassiz observes, that the impression of the teeth of the hinge is among those characters which will not probably be found in impressions: (*Memoires sur les moules des mousques* p. 8.):" and in his plate of the cast of *cardita sulcata* accordingly the hinge is not traceable.

It is found very thick in some beds of the yellow limestone, the shell being always destroyed or replaced by the limestone. It occurs also in the white limestone.

10. *Cardium Ægyptiacum* Pl. v. fig 8.

11. *Tellina?* *Ægyptiaca*.

12. *Psammobia Ægyptiaca*. Associated with the *solen* in the Mukattim hills. The same cast is also among Mr. Leith's specimens from Hyderabad in Sindh.

13. *Corbula cuspidata*. Pl. v. 3. Min. conch. Tab. 362.

Although I have only a cast, and that without a hinge, the shape of the shell seems to identify the Egyptian specimen with the English fossil; which is found with fresh water shells in some of the newest formations. There is but little difference between it and the *C. revoluta* of the London clay; and since it is an inhabitant of rocks, and subject to considerable deformations, all probably belong to one species. It is not uncommon in the yellow limestone, and a series may without any great difficulty be formed.

I can see no essential distinction between this and *C. trigonalis* of the Cutch fossils; and as this is said to differ from Lamarck's *C. rugosa* only in being wider and with more regular and prominent laminæ upon the surface, I should think that future collectors will be able to bring both from Egypt and Cutch a series, which will identify all the above species as varieties of one only. *C. rugosa* is a Paris basin shell.

14. *Corbula Lyrata* Pl. v. fig. 5. I think this must be the same as *C. lyrata* which is described as a *secondary* fossil from Cutch. Geol. Trans. Vol. V.

15. *Solen Ægyptiacus*. A cast of the character of *solen radiatus*. It is very abundant in one spot in the Mukattim hills, where the specimens lie in masses on one another. Some of them are a foot long. The layer belongs to the yellow limestone.

CIRRIPEDÆ.

Balanus Amphimorphus. Lamarck. Pl. vi. fig 2. This species seems to have been considered by Lamarck an intermediate link between *B. tintinabulum* and *B. perforatus*. *B. crassus* of the M. C. (1 ab LXXXIV) seems to be also identical with it. Neither does the specific

difference of *B. tessellatus* appear of much value in a genus, the species of which have peculiarly variable characters.

B. crassus and *tessellatus* are both crag fossils, and *B. amphimorphus* is said by Lamarck to be an Italian fossil.

The Egyptian specimen is on a *pecten* from the *great pecten locality* near the middle station.

ECHINODERMATA.

1 *Scutella subrotunda* Pl. viii. The beautiful monographs of the Echinodermata, which are now in course of publication, under the direction of M. Agassiz, enables even a tyro to speak with some confidence of a species. My specimens agree perfectly, except in two points, with the minute description of *S. subrotunda* in the monograph of Scutella. These two characters are that the *S. subrotunda* is described as having the the posterior ambulacra rather shorter, than the other three; whereas those in the Egyptian specimens seem quite equal; and the petals of the Egyptian specimen are very blunt, whereas those in M. Agassiz's figure are tapering. The correspondence of all essential characters will be seen on comparing the two figures. I have not attempted to draw the structure of the test which agrees however exactly with the European specimen, and the tubercles on the upper surface are smaller than those on the lower.

It is to be found in great numbers in the uppermost strata of the yellow limestone, with *pectens* near the middle station, and also just behind the third station bungalow near the telegraph.

The *S. subrotunda* is found in the *meiocene strata* near Bourdeaux.

a. *Upper surface.*

b. *Half the lower surface.*

c. *Vertical section, shewing the thickness of the shell.*

2. *Clypeaster varians* Pl. x fig. 1, 2. The characters of the Egyptian fossil seem quite sufficiently identical with the Cutch *clypeaster* (Pl. xxv. fig 21 Geolog. Trans. Vol. V.) to identify them specifically. In the Egyptian specimen the anus is closer to the boarder, and the vertex is a little more eccentric.

The Cutch specimen is from the nummulitic limestone; the Egyptian is from the white limestone in the Cairo quarries.

3. *Clypeaster Ægyptiacus*. Pl. ix. fig. 1. a. Anus very near the

border and transverse. Mouth central. Poreless lizes from the ambulacra continued to the mouth. Height of the shell apparently not so great as in *c. varians*.

I obtained only two imperfect specimens of this from the third station. They belong to the uppermost strata of the yellow limestone.

4. *Spatangus acuminatus*. Pl. x. fig. 3, 4. This is also figured by Col. Grant as from the nummulitic limestone of Cutch. It is frequently crushed and injured. It is abundant in one strata of the yellow limestone at Cairo, with fragments of *eschara* and spines of *echinodermata*.

5. *Cidaris clurifera* ? Pl. ix. fig. 2. 5. These fragments are so much like *C. clurifera* which belongs to the upper part of the *calcaire neocomien* of Neufchatel, that I hesitatingly refer both the spine (fig. 5.) and the tubercle (fig. 2.) to it. It is found in the same bed at Cairo as *Spatangus acuminatus*.

4. *Cidaris Ægyptiacus*. Plate ix. fig. 4. These spines must belong to tubercles much the same as fig. 2. They are very remarkable spines, being found six inches long; but the rock in which they are, is so loose that I could carry away nothing but fragments.

5. *Gymnocidaris Ægyptiacus*. Plate 4. fig. 3. I conclude this fragment belongs to this new genus separated from *cidaris*. It might belong to *pedina*, but there are only two pores in pairs in the ambulacra. All but these two subdivisions have, I believe, large turbercles on the test, which my specimen is without. Locality, with the *spatangus acuminatus* and *cidaris*.

CRUSTACEA.

Carpilius, Plate, xi. *Sectional and generic character.* Carapace arcuated. Plastron very narrow, epistoma rectangular and much broader than long. Third article of the jaw feet quadrilateral, without a notch externally, and not extending beyond the insertion of the fourth. External antenna situated in a fissure at the internal and lower corner of the ocular cavity. Internal antenna inserted at the internal angle of the eye to which it is contiguous. Anterior feet nearly or quite equal. Fingers not spoon shape. Posterior feet without a crest above, but rather angular.

Specific characters. Regions of the *carapace* well defined; surface mammillated and covered with minute granules, which are all over the test excepting the legs. One mamilla on each of the gastric regions; three on each

of the biliary regions; two on the genital; three triangularly disposed on the cordal; eighteen on each of the bronchial regions. Interocular space about $\frac{1}{4}$ of the longitudinal diameter of the test, divided by a canal which is separated from each ocular cavity by two tubercles. Two tubercles at the external angle of each eye. Anterior lateral border sharp and five lobed; two lobes being opposite the biliary region, and three to the bronchial, the three hepatic lobes terminating each in three recurved spines; the posterior biliary lobe in two spines and an abortion, the anterior in two spines. The anterior border is continued posteriorly in a line of six tubercles of which the middle is small, but the most posterior is very large, and divided into one large and two small processes. Hand broad but thin, with three obscure rows of tubercles on the posterior side, moveable finger with (four or more) spines above. Arm crested posteriorly. Transverse longitudinal diameter: 16 : 9, not reckoning the breadth of the lobed border. Transverse diameter of the largest (a male individual) $3\frac{1}{2}$ inches. Posterior border one inch. Interval between the external angles of the ocular orbit $1\frac{1}{2}$ inch.

The figures 1, 2, 3 have been drawn and above described from comparison of 13 specimens.

Fig. 3 *a.* the eye lying in the ocular orbit.

b. the place of the external antenna.

c. the place of the internal antenna.

d. the mouth.

e. the canal in the middle between the two orbits.

It is found in great abundance in the white limestone quarries near Cairo.

PLATE XII. *Corals.* I do not venture to discuss the specific characters of these corals.

Fig 1. A species of *eschara*, very abundant in the yellow limestone and characterizing a bed. It shows the dichotomy of the branches; *b* is a magnified representation of the cells; *c* is a section of the stem.

Fig. 2. An *astræa* (very common also in the yellow limestone.)

Fig. 3. a body very common in the white limestone. They are sometimes supported on long stems, and the cup-like body is composed of many growths which have a tendency to fill it up. From the sides of a cup other cups seem to grow out. From this it seems to be a *coral*, but I could discover no trace of cells.

Fig. 4. A microscopic object in the white limestone; an elliptic body with oblong cells at the surface, penetrating a short distance into the solid mass.

ART. II.—*Cuneiform Inscriptions. Translated from the eighth volume of Ritter's Geography.*

IT was Anquetil Perron, who in 1771, conveyed to Europe the remains of the Zoroastrian liturgical Zend and Pehlvi books, which the Parsees of Surat had for six hundred years preserved out of their ruin. (As. Res. Vol. IV, 1 P. p. 615—619.) These he published in three volumes 4to. under the title : *Zend-Avesta, Ouvrage de Zoroastre* ; and they were immediately republished, in a German version, with additions by I. F. Kleuker. Since that time their contents were treated in various ways ; but the text remained unedited. The language continued unknown, except from the very imperfect Zend and Pehlvi vocabularies appended, often with errors, to the third volume ; and there was neither grammar nor lexicon. Yet from the first there were those who conjectured that the Zend might belong to the family of the Sanskrit ; but Anquetil's versions were too faulty to be of use, as he had to follow, in the interpretation of the text, his Parsee instructors, the Mobeds of Surat. They were themselves but slenderly instructed, full of the opinions of their cast, and of intentional, systematically deceptive errors.

The Zend was indeed the original idiom of the Zoroastrian books, but it was on insufficient grounds that Anquetil gave this name to the above-mentioned work. This Zend text was translated, at a period unknown to us, into another language, the Pehlvi, entirely diverse from the Zend, enriched in a considerable degree from the Semitic idioms, which are far remote from the Zend. At the time when the legal and liturgical books were communicated to *that* Iran, which was devoted to the laws of Zoroaster, the Zend was by no means the only language generally known : and the modern Parsees attribute as great authority to the Pehlvi version as to the original. It is in fact easy to prove, says Burnouf, that the Pehlvi has continued for several hundred years, and even till our own day, as a learned language ; it has thus far been impossible to show a longer prevalence of the Zend. Whence the above-mentioned opinion of many, that the Zend existed, not as a popular dialect, but only as a religious language in the Zendavesta, or as a learned language ; which is however contradicted by the existence of indigenous Zend appellatives, even to the present time, in the spoken tongue of certain districts.

That Pehlvi version, as Burnouf says, may have had its origin in a time when the priests still understood the Zend, but when they had to substitute the former for the people, by whom the too brief Zend was no longer intelligible. This version was therefore accompanied with a gloss, which was far more diffuse than the text : so that the Pehlvi is not sufficient of itself to give the obscure, concise, original Zend. In the Pehlvi version, which was at the same time a commentary, the knowledge of the Zend, as no longer necessary, died away, even among the priesthood. And further, the interpretation of the Zend books became exclusively the province of the Pehlvi.

This Pehlvi flourished till the time of the Sassanide dynasty ; it even survived the destruction of the Zoroastric rites by the Mussulmans ; but not in the case of those followers of Zoroaster, who fled to Guzerat. The poverty, the reverses, the flight of these, their three hundred years of Yezdejd, the death of their last believing King, their beginning dispersion, their intestine, manifold divisions, all prevented this. After a hundred years of residence in Kohistan, and a flight to Ormuz, where they remained fifteen years, and to Diu, where they remained nineteen years, and after their final emigration to Guzerat, they had, in the fourteenth century, lost the copy of the Vendidad which they once possessed. One Destur Ardeshir, a learned Parsee from Sistan, came to Guzerat, and gave the priests a copy of the Vendidad in Zend, with the Pehlvi translation. From this two copies were made, and hence all the Vendidads in Zend and Pehlvi, which are extant in India.

But even the Pehlvi version underwent manifold alterations, by a Destur, or learned Parsee, of Kerman, and by his disciples. The language itself was gradually going into disuse among the Parsee priests, and had, just before Anquetil's time, been restored in a new form by this Destur, at Guzerat.

Such being the oblivion of the language, there could scarcely have been a hope of redeeming the original text from the corruptions of later hands, if there had not been discovered two other helps, as Burnouf tells us, by means of which a new critical investigation became possible. First, the analysis of the original text by the aid of the cognate Sanskrit, a language now fully developed in its grammatical character, both in regard to criticism and literature. Secondly, the tradition of the Parsees, derived from an older source than the accounts of Anquetil's instructors. These last

relate not to all the portions of the Zend, so-called, which are extant in the collection of the Vendidad, (the primitive legends and prayers,) but only to that portion of them called in Zend Yaçna, in Pehlvi *Izeshnè*, that is, Liturgy or Prayers. But these throw light on the other parts. The older source, to which allusion is made, is a manuscript in two copies of this liturgy, in Zend and in a Sanskrit version by Nériosengh, more fully brought to light from Anquetil's remains, in a very ancient original, and a modern copy. These made the critical labours of this sagacious investigator possible, and he published them under the title: *Commentaire sur le Yaçna*, thus far to half their extent; and we owe to this many of our contributions above to the geography of old Iran.

From the products of these sources however, we must carefully distinguish the results of the cuneiform inscriptions; which, in like manner, are now only beginning to be unfolded, inasmuch as the method of deciphering is not yet fully established in all its parts; as the language in which they were written, to say the least, is not yet intimately known, and as most of the copied texts are not yet accessible to general investigation, and many, unknown original inscriptions, may be lying, in the darkness of oblivion, in the furthest and most unfrequented districts of Iran, especially in eastern Persia.

Among the sure results of earlier deciphering, Burnouf reckoned, in his learned memoirs on the cuneiform inscriptions of Hamadan, the names Darius and Xerxes, found in inscriptions by Grotefend, as is sufficiently known from Heeren's celebrated ideas on the Politics and Commerce of the Nations. The name *Achæmenes* was read by St. Martin, and more exactly by Rask. The word *Kscak*, king, was deciphered, and correctly furnished with the proper vowels, by Grotefend and St. Martin; yet much was still wanting. Of five quite large cuneiform inscriptions in Niebuhr's copies only two of the shortest had as yet been attempted, and without success. Yet the name *Goschtaspa* was read by Grotefend, and more correctly *Vychtaspa* by St. Martin. The word King appeared in three different grammatical forms; but neither the grammatical construction, nor the language itself was thereby made apparent. Grotefend considered the language as Zend; St. Martin for one very nearly allied to Zend. Rask took the Zend to be the primitive language of Media. He amended two letters of the cuneiform inscription, and instead of *Achæmenes* read more correctly *Aquâmnôsôh* (*akhéôtschôsôh* of Grotefend, *ôukhaâmzychyé*

of St. Martin ; he read as a termination of the genitive plural from *rex, anam*, (viz. in *ksdbyohánám*, i. e. *regum*, instead of Grotefend's *ôtscháo*, and St. Martin's *abad* or *amad*); and Bopp concurred, declaring the language of the Persepolitan inscriptions to be the Zend. (*Jahrb. f. Wiss., Er. Dec.* 1831. p. 819). Burnouf has shown how far the special interpretation of the cuneiform inscriptions then known was advanced, when as many as forty-two copies of cuneiform inscriptions appeared in the papers which the lamented Dr. Schulz collected with untiring zeal, in his journey in Kurdistan, on the lake of Van. These he collected in different places, especially in ancient Media. These, with such as were before known, have afforded the objects of the latest grammatical investigation, from which some morsels have fallen to the share of geography, as will appear in the sequel.

Cuneiform inscriptions were left by Xerxes, on the rocks of Elwend, (Alvanda,) at Hamadan, on the ancient Orontes, and on the lake Van ; likewise amidst the ruins of Persepolis. All these have certain parts common, and others in which they differ ; as further appears from fragments in Ouseley's collections, so that the same inscriptions are engraved at Ecabatana, (Hamadan), and at Persepolis. Little attention has thus far been paid to the imperfect ones, and only the two completest inscriptions, or rather the double inscription at the foot of Mount Elwend, (Alvanda), with the names of Darius and Xerxes, have been, especially with Burnouf, the chief objects of investigation ; together with two shorter ones, one from a pillar at Murghab, near Persepolis, furnished by Morier, Ouseley, and Ker Porter, bearing the name of Cyrus ; the other, the so-called inscription of Tarku at the eastern foot of Caucasus, on the western bank of the Caspian sea, which was made known by Witsen a hundred years ago, and bears the name of Arsaces. The double inscription, at the foot of Mount Elwend, (Alvanda,) is on a large block of red granite, in three rows of cuneiform characters, cut in two sunken portions ; and the other, that of Xerxes, at the top. Of the three parallel rows of the Darius-inscription, the first consists of twenty lines ; the second and third uniform rows, which are in different character, probably what is called the Median and Assyrian, but which are not yet known, have perhaps the same contents with the first, but in other languages, more nearly allied to the Semitic. Here it will be interesting to subjoin the deciphering which has been accomplished of the twenty lines of cuneiform writing, as a sample of the language, adding

a strictly literal translation, in order to present a picture of those monuments and times.

DARIUS INSCRIPTION.

1. Bû izrk âurmzdâ.
2. ah ômân buiôm
3. âdâ ah âim âçmâmu
4. âdâ ah mrtôhm
5. âdâ ahchôhâtâm
6. âdâ mrtôhâhâ
7. ah dârhium khchahyôhm
8. aquunch aôm
9. dlunam khchahy hm
10. aôm plâm
11. frmâtârm âôm
12. dâchiuch khchahyôhm
13. izrk khchahyôhm
14. khchahyôhm ânâm
15. khchahyôhmôâhunâm
16. pl ôznâ nâm khchâhy
17. khchahyôh âahâhâ buiôhâ
18. izrkâha rurôh
19. âpôh gochtâcpahâ
20. pup akhâmnôchôh.

LITERAL TRANSLATION, BY
BURNOUNF.

L'être divin Ormuzd
il le Homa excellent
a donné ; il le ciel
a donné : il l'homme
a donné ; il la nourriture
a donné à l'homme ;
il Darius roi
a engendré ce
des braves Roi
ce des braves—
Chef ceci est
Darius roi
divin, Roi
des Rois,
Roi des provinces
qui produisent les braves, Roi
du monde excellent
divin, ; redoutable
protecteur de Gôchtaçpa
fils Achéménide.

The meaning is : "Ormuzd, the divine being, gave the excellent Homa, (a sacred plant), he gave the heaven, he created man, he gave him his nourishment ; the begat King Darius, the king of heroes, the head of heroes. Here is (probably in reference to the sculptures near the inscription) Darius, divine King, king of kings ; King of the provinces which produce heroes ; King of the Behescht (i. e. the glorious and divine world, paradise) ; fearful protector ; Son Gustasp of the Achæmenides."

The second inscription is almost identical with this first one, except that the name of Darius is exchanged for that of Xerxes. Both stand in such an elevation and such circumstances, that they evidently belong to sculptures to which their contents have reference.

The third or cuneiform inscription on the column at Murghab, north of Persepolis, was brought to light by Morier in his first journey, and then made public by Ouseley, and more perfectly by Ker Porter, with the beautiful bas-relief above which it stands. St Martin, by his method of deciphering, read on it the name Houschousch, which he took for Oxus (Ochus) ; Grotefend the name Kusruesch, which he took for Cyrus. Burnouf reads the text of the whole inscription, *Adm guluch khchâhyôh*

akhāmnocoh; "This (is) Cyrus, king (of the) Achæmenides." In this inscription, *quluch* or *quruch* is Kyrus, the Greek Κῦρος, (Κόρος, in Etym. Mag. ὁ βασιλεὺς τῶν Περσῶν, ὁ Παλαιός· Ἡλίου γὰρ ἔχει τὸ ὄνομα. Κοῦρον γὰρ καλεῖν εἰώθασιν οἱ Πέρσαι τὸν ἥλιον;) from khor. This khor is contracted from Kava Hucrava, in Zend, identical with Ke Khosto, or Kai, which Zend-forms have as their common root Kava, kavi, which, in the Sanskrit, according to Wilson, means the sun. Hence, in the Sanskrit version of the Neriosengh, Kavi, the designation of the royal family, is identical with the Sun-race of the Kaianian dynasty; the title Ke being prefixed, as in Ke Khosro, Ke Custap, etc. The title under which this sun of men is worshipped, is in Zend huarē, the same as khor; but the title of the royal race descended from this divinity, is in Zend ke or kavi. Thus the race of the sun shows itself not only among the Brahmans, but the Iranians, who like the former call themselves Arians.

The beautiful figure sculptured in marble is therefore Cyrus, in honour of whom was likewise erected the sumptuous building in the valley of Murghab, of which the ruins lie scattered about. The ancient sepulchral monument in the same vicinity, (Madré-i-Suleiman, Morier and Ker Porter. p. 498), was hence pointed out by the sagacious Grotefend, as the tomb of Cyrus. In the image of Cyrus, on this column, beneath the inscription, which is entirely different from those of Darius and Xerxes at Persepolis, Burnouf finds the confirmation of the inscription itself: for it represents the apotheosis of Cyrus.

The names of Darius Hystaspes and Xerxes also receive their etymological explanation in the cuneiform inscriptions and the Zend. Darhinch, i. e. coercitor, according to Burnouf, from the Sanskrit verb dhri, Zend dere, continere. Hence Hesychius renders the word Δαρειός by φρόνιμος. Lassen more exactly deciphers Darhawus, hence the Hebrew שֹׁרֵטְשֵׁת confirming the derivation from the Zend-root dere, as found by Burnouf; "the Regulator or orderer." Lassen reads in this inscription Hystaspes, vistâcpahâ, from açva, in Zend, horse, "he who gets horses," agreeing with Burnouf, *Comm. on the Yaçna* p. cv., who compares this Vistaspa, in signification with the French écuyer, and takes it for a more ancient title in Zend, which Ammianus Marcellinus seems to give in his "Vitaxæ, id est Magistri equitum." Von Hammer, however, deduces this word from the Persian Issfehbed, from Issfeh, *Pers.* a knight, which

becomes Sipahi, and among the Anglo-Indians, *Seapoy*. Xerxes is Ksh-ârsâ of the cuneiform writing, in the Assyrian pronunciation Kshras, and by transposition (a)h(a)sueros, the Ahasuerus of the Bible, from the Zend-root ksâh, to rule, (hence k'sathra, king, and the royal caste in Sanskrit;) and, in the second half of the name, the Zend word eres, by contraction ars, i. e. pure, good; hence, "the good ruler," or the "good king."

On the sculptures of Persepolis, Darius and Xerxes are surrounded with the splendour of supreme power and glory, their great men and their whole court, and even their people; so that in the imagery, as in the inscriptions, they appear as "kings of kings, as kings of the provinces, and leaders of heroes." In the ruins of Murghab, the image of the mortal king upon the column of marble, in addition to the royal mien, accompanied by that of a celestial being with outspread wings, holding place among the Izeds, the guardian spirits of the Ormuzd-heaven, (*Ized*, Pers. *Yazata*, Zend;) among whom the superstition of Iran could place the founder of the Persian monarchy, as that of the Quirites did their Quirinus. On the Persepolitan monuments appear also the kings Darius and Xerxes, the only ones as yet certainly discovered, in forms of human majesty, with their historic accompaniments; elsewhere, however, as in the case of Cyrus at Murghab, only with symbols, which have a religious significancy, and appear to be of different origin from the genuine Persian.

The Tarku inscription is here worthy of notice on account of its geographical site at the northern foot of the Caucasus, and because it is in a cuneiform character which does not contain the simple system of the double inscription at Elwend, but consists of a mixture of characters, which seem to be compounded of three different sorts or systems of cuneiform writing, as these occur in the double inscription and on other monuments; an observation which did not escape the sagacity of Grotefend, who hence derived a doubt at an early period, as to the correctness of the copy. This has now however been removed by a second copy of the same, among the papers of Dr. Schulz; the language, therefore, no more than the character, is the old Persian. From the locality on the north-western side of the Caspian sea, St. Martin had concluded that they must concern an Armenian king of the Arsacides, who pushed his conquests of the Kheizars into their own territory, and to immortalize his victories, caused this inscription to be graven in the rock. This

seems to be confirmed by the investigation of Burnouf, who finds in it the name Akchk, which he thinks not very remote from Achek, Archak, (Arsak, or from Ἀρççϝ, i. e. Arsacide). It is here that we find the most northern limit of cuneiform writing.

Thus far has the deciphering of the cuneiform inscriptions been carried by Burnouf; but he has also been employed about the first of Niebhur's copies, a very important geographical document, inasmuch as it enumerates the people tributary to Darius. Of this, however, he touches only in passing, on some of the names, so far as to criticise and make them public. He gives the names, Mad, Babolouch, Arbah, i. e. Medes, Babylonians, Arabs; the Ayura, Aroei; the Ktpdhuk, Cappadocians; Arion, Arran; Zrk, Arôî, Bakkhtroch, Cughd, i. e. Zarangians, Haroyn, Bactra, Soghd, &c. He has not overlooked the great importance of this inscription, which no one before him seemed to perceive. He regards it as collateral with the well-known catalogue of the twenty satrapies in Herodotus (III. 90-93). It belongs, he thinks, to the most flourishing period of the dominion of Xerxes, who here appears with the same title as his father Darius, son of Hystaspes, to whose honour he erected a monument like his own. Here we behold him surrounded by those heroes, the Pehlvan, who are of ancient fame in Asia, and whose images accompany his own on the monuments of Persepolis, just as a hundred years before, Cyrus was accompanied by his body guard.

In regard to the ancient language and writing of Iran, the following are the results of these researches :

The cuneiform writing, in relation to the language in which it is executed, shows that the sounds are not all expressed by the characters. Thus âurmzdâ, in the first line of the inscription above, is fully written in Zend Ahura mazda, i. e. divine being; whence by contraction Ormuzd. In this familiar name the deciphering is easy, but great doubt attends the interpretation in other places. So for example, in the Hamadan inscription, when we meet with cprd, as the name of a people, Burnouf arrived, at the conjecture of the Sporades, while Lassen shows that it denotes the Sapiri, from which name the *d* has fallen out in the Greek translation. The words which Burnouf reads Uiarzioh and Ytghuch, naturally suggest to him the Οἰχαρδοç and Ythaguri, on the confines of the Seres; but Lassen, by a very slight change of the lection, recognizes the names of the Quarazmiah (Charasmii), and Zatagadus (Sattagydes). Here,

therefore, a wide field lies open for criticism. This circumstance shows a great discrepancy between the language and the system of writing. There is no doubt that the language belongs to the Indo-Persian family, in which a full and consistent expression of the vowels is a demand of the language, and indispensable in writing. This discrepancy, according to Burnouf, results from the conflict of two different systems, the Japetic, to which belong the Indo-Persian and the Germanic languages, and the Semitic, which reveals itself in the cuneiform writing, inasmuch as the character does not fully express the pronunciation. The system of the first of the three rows of cuneiform characters, on the double inscription at Elwend, which at the same time is the most simple, and reappears in most of the inscriptions at Persepolis, is not, in Burnouf's estimation, of Iranian, but of Semitic origin, a Babylonian writing, first borrowed from foreigners by the Persians. Before Cyrus the Persians possessed no writing in which they could record this name, till then unknown in the history of the world. History has not related from what people the Persians derived their cuneiform system. Grotefend supposes from the Medes, their former masters. Herodotus says, IV. 87, that Darius used Assyrian * characters, when he finished the columns commemorative of his Scythian expedition, and placed on the bridge of the Thracian Bosphorus, with the names of all the nations who accompanied him, but Assyrian on the others. This then, as Burnouf supposes, was probably the cuneiform character, which perhaps by Median intervention had at this early date found entrance from Nineveh and Babylon, where that sort of writing, though in complicated forms, is found upon the ruined bricks and on other monuments. The correspondence discovered by Lassen, on the other hand, between the cuneiform system and that of the Sanskrit Devanagari, of which more will be said below, renders this hypothesis of Burnouf very doubtful.

The researches of Burnouf reveal to us the closest resemblance even in the slightest inflections, between the Zend and the unknown language of the cuneiform double inscription of Darius and Xerxes. Thus it is not the Zend of the Zoroastrian books, though belonging to the same family. It much more really resembles the idiom of the Brahmans, the

* So says Ritter's text, but Herodotus has *ἐνταμὼν δὲ γράμματα, ἐς μὲν τὴν Ἀσσύρια, ἐς δὲ τὴν Ἑλληνικά*, which shows an error in the above sentence, and clears the sense.—TR.

Sanskrit, though it has a character of its own, and must therefore be an independent tongue, which in some, though not very numerous instances, is like the modern Persian. It must then have been an actually spoken dialect, in which as that which was generally understood in the country, the Persepolitan inscriptions were cut into the walls of stone; and two nearly allied, yet dialectically different reigning languages then prevailed in the Persian monarchy.

Lassen, whose researches in this substantially agree with those of Burnouf, has on this account called it the Medo-Persian language, in contradistinction from the Soghdian-Bactrian, by which name he designates the Zend of the Zoroastrian books. That at the time preceding the Macedonian invasion, and of course during the dynasty of the Achæmenides, such dialectical difference together with such a resemblance actually subsisted in the languages of the Medes, Persians, Arians, Bactrians, and Sogdians, we may be assured by the historical testimony of Strabo, (xv. 2, § 8, p. 224, ed. Cas.) that these people had almost the same language; εἰαὶ γὰρ πως καὶ ὁμόλωτται παρὰ μικρὸν. And this is confirmed by a second testimony preserved by him from the work of Nearchus, in which the latter says of the manners and language of the Carmanians, that they are for the most part Persian and Median; (Strab. xv. 2, § 17, fol. 727, ed. Cas.) thus rendered: Nearchus asserit Carmanitarum mores ac sermonem maxima ex parte Persarum esse ac Medorum aemula.

The contemporaneous existence of three rows of different cuneiform writing in the double inscription at Elwend, might induce the conjecture that they belonged to three different languages, of which the first was merely a sacerdotal language, of religion and the laws, remaining unknown to the people, like the Egyptian hieroglyphics, or the Greek and Hebrew of the Christian Church; while the other two were translations into the common dialects. But it is conclusive against this that even the first language of the cuneiform inscription by no means contains the Zend of Zoroaster, but only a dialect widely diverging from the Zend text. It is as improbable that at the same time, in the fifth century before Christ, the pure Zend was the common language of districts lying so wide apart, and in so different degrees of culture, as from Bactria and Ariana and Persis, as it is probable that the speech of the inhabitants of the proper Persis, in the time of Darius, should have borne a certain relation to that of the Bactrian, Sogdian and Arian countries;

since even in our day there are resemblances between the ancient Persian and the Indo-Bactrian tongues.

The Persepolitan popular language, or Medo-Persian, barbarous as it seems from these cuneiform monuments, is nevertheless, on this very account, of far greater interest, than if the inscriptions, as was the earlier opinion, were merely in the Zend of the Zoroastrian books, which both in itself and in comparison with the finished Sanskrit (Sanskrita, i. e. polished, perfected, complete, or classical tongue: Bopp) must be denominated a very rude language. For, in that case, we should only become acquainted with a learned tongue, five hundred years older than our era, whereas we now possess in it, says Lassen, the monument of a national language, which was spoken during the time of the Persian monarchy. These inscriptions prove indeed the existence of the Zend, and are a memorial from which the religious ideas of the Zendavesta break forth afresh; but they are at the same time conclusive touch-stones of the influence exerted by the sacred language of the Arians on those of Persian Asia.

This influence is apparent in the extraordinary number of geographical names on the field of northern and eastern Ariana as far as the Jaxartes, all of which receive their elucidation from the Zend, and their confirmation from the ancient classics; which will, below, be made further apparent in like manner from many national names still used by the people of western Iran as far as the Tigris. Hence the Zend can no longer be regarded as a dead language of priests, but must be admitted to the rank of popular languages, and as one which was growing old even five hundred years before Christ.

As to the Zend, and its relation to the Indo-European trunk of languages, otherwise called by Bopp, the Indo-Germanic, some remarks may here be made which concern their geographico-historical-position. This great philologist regards the Zend, neither with Rask, as a language altogether independent of the Sanskrit, nor yet as a mere dialect of the latter, but as having a sort of independence, like that of the Latin when compared with the Greek, or the old Northern as compared with the Gothic; whence this remarkable fact, that in many points, as the master of Sanskrit grammar expresses himself, it spreads into the other, of which the theory is thus rendered more comprehensible; for which reason we have above called the two, sister-languages. But, according to the researches of Burnouf, who also recognises the remarkable analogy

between the Zend and the Sanskrit, especially in the Vedas, these two moreover stand at the head of two systems of language of the same great division, which under different influences have been unfolding themselves during long periods,—namely, the Classic and the Germanic; or more specially the Greek and Latin on one hand, and the Gothic and Germanic on the other. The Zend follows more closely the law of the Gothic and Germanic tongues, diverging more from the Greek and Latin, to which, on the contrary, the Sanskrit approaches. To illustrate the analogy of the Zend and the Sanskrit, we adduce some words: In Zend, the son is *puhtra*, sun *mithra*, land *choithra*, command *ferman*; In Sanskrit, *putra*, *mitra*, *kehetra*, *pramana*. To show how the Sanskrit and Zend stand at the head of two systems of the same great division, a few words will suffice. In Sanskrit, three is *tri*, in Latin *tres*, in Greek *τρεις*, in Zend *thri*, in Gothic *threis*. In Sanskrit, brother is *phratri*, in Latin *frater*, in Greek *φράτηρ*, in Zend *brátar*, in Gothic *brothar*.

Besides the numerous tribe of words, which belong equally to the Zend and the German, the analogy between the Zend and the Gothic is so marked, that by means of these the great German grammarian Grimm, in his table of Consonants, has elucidated a number of particulars in which the Gothic differs from the Greek and Latin.

Cuneiform characters have been found as far west as Beyrut, (Monument de Berytus in *Bulletino dell' Istituto di Corrispondenza Archaeologica*, No. 3, Roma, Marzo, 1833. P. 20—27, by Bunsen, Felix Lajard, and Cailler,) and even on the Nile, according to Young. The most important ethnographical document, in this character, is that of Persepolis, copied by Niebuhr, containing all the tributary tribes. According to Lassen's lection, it runs thus :

adam dârhawus' k'sâhziâh wazark	darhawus' k'sâziâh was'nâ auramâz
Posui Darius rex magnus	dangâ
k'sâhziâh k'sâhziânâm	Darius rex voluntate Auramazdis
rex regum	imâ danghâwa thâ.
k'sâhziâh danghunâm tês'âm ps'unam	Hi populi illi.
rex populorum horum bonorum	âdâm âdars'âh adâ ânâ pâraçâ kâra
vis'taçpangââ put	Posui debellator, Heic hi Persæ ministri
Vistaspis filius	thâ ayâm atarç manâ
ak'âmanis'âh zâtâh	Isti (populi) adorati sunt. Agui, mihâ
Achæmenius nobili genere	bâg iâm âbâr.
	tributa attulerunt,

The names of people which follow are in this order : "Choana, Media, Babylon, Arbela, Assyria, Gudrâha, Armenia, Cappadocia, Capardia,

[What follows is not translated, but abridged, or culled from the midst of geographical details. What is placed within inverted commas, is translated].

Hunae; tum hi, Uscangae, porro hi, Drangae; porro regiones hae, Parutes, Agartia, Parthae, Zarangae, Aveiae, Bactria, Cugdia, Chorazmia, Zatagadus, Arachasia, India, Gadar, Cacac, Maci."

The following particulars occur concerning some of these;

Mad, that is Media, Madai. (Gen. 10, 2.).

Arbāh, comp. Arphaxad, Gen. 10, 22.

Hund Sacae: the Huns and Scythians. The residence of these is placed by Ritter south of Caucasus and the Colchians, where Herodotus gives us his 19th satrapy, made up of *Μόσχοι δὲ, καὶ Τιβαρήνιοι, καὶ Μακρῶσι καὶ Μοσσυνοκοί, καὶ Μαρσι*. The Tibareni and Moschi are the Tubal and Meshech of Gen. 10. Now the Talmuds call both these, *Huns*.

ART. III.—*Seven Ancient Inscriptions in the Devanagari and Hala-Kanari characters, collected in the vicinity of Kolapur, and translated into English.* By BAL G. SHASTREE, Esq.

1. The accompanying seven inscriptions are from Kolapur. No. I, was procured by my friend Keshavarao Narsing, the tutor to the Raja, and carefully compared by myself with the original in the temple of Mahalakshmi, commonly called Ambábái, the mother. No. II, III, and IV, were copied by myself; and the remaining three (i. e. Canarese ones) were transcribed at my request by a person, pretty well conversant with the ancient dialect of that language.

2. I annex a complete translation of No. I. It mentions the names of four kings of the well known Chalukya family; Karnadeva, his son Vetugideva, Someshwara, and Somadeva. The capital of this branch of the Chalukyas is stated to be Someshwar in the Konkan, which, there is reason to suppose, was always the residence of the provincial chiefs. This document does not bear any date. The copy originally obtained was dated the 60th year of Shalivahana; but I found nothing to indicate this in the original, and the interpolation could be easily accounted for, as the transcript came from one of the priests, who are interested in assigning to the temple as high a degree of antiquity as possible.

The analogy of the character would not justify me in pronouncing this inscription older than the tenth or eleventh century of Shalivahana.

4. The inscription No. II, was found on a pillar of an old open temple called the Mandapa of the nine planets, from its having the figures of the sun, moon, and other heavenly bodies upon it. It is the grant of a spot of ground, on the eastern side of a village called Kettadasari, made by the great King, *Rāja Narayana Mahārāja Mahādeva*, the younger brother of Abja, and the protector of the original symbols of Mahalakshmi, monasteries, and charity houses at Kolapur, to Kana-kachandra, surnamed Saraswati Kanthābharana, (the necklace of Saraswati or the goddess of learning) the master of the charity house, living in the Mandapa. The same document records the grant of a house to Keshava and Narasinha, and is dated, Friday 15th Magha Shudha, in the Shalivahan year 1162 called* Krodhana.

5. No. III, is the grant of a village called Kuradi, made in Shāka year 1172, by order of an officer of the abovementioned Yadava Narayana, called also *Shri Kankaradeva Vijaya*. This officer, whose name is Kanaya, calls himself "the worshipper of the sovereign's feet, entrusted with the collection of taxes in the districts of Kolapur and the whole of the King's dominions." The individual by whom the order is carried into execution is "Baswaunaya, the Governor or Chief of the town," and its object is "to secure the prosperity of Gautamāri Keshavadeva, and his wife Edavā."

6. The character in which the three preceding inscriptions are written, differs so little from that of other records of the 11th and 12th centuries of Shalivahana, that with the very limited time at my disposal, I did not attempt making fac-similes of them. There are some doubtful letters in Nos. II and III, which a second reading might have cleared up.

7. The inscription No. IV, appears on a stone, in the town-wall near the *Varuna-tirtha* gate, which is well known to have been originally found under the ground by the late Raja who repaired the gate. It records another grant by Rāya Narayan called also Ravaladeva. It is a document of considerable length and some historical importance; and I regret that, owing to the inconvenient situation of the stone and the lamentable action of the elements upon the upper part of it, I did not

* The year is marked doubtful in my copy, the Krodhana year appears to be 1187 and not 1162.

succeed in obtaining a complete transcript. Imperfect as it is, it supplies after the usual invocations to Maháalakshmi, the names of Sinha, Aidavá, Krishna, and Rama, as the ancestors of Naráyana; and states what is perhaps more interesting, that the first of these had the seat of his power at Mirjaya (Meritch). The inscription is dated 15th Magha, 1194 Shaka year, called Angicas; and records the following grants made on the occasion of a solar eclipse, viz.

1. Divya Sevyá (village?) for the morning worship of the goddess and the distribution of victuals to ascetics.

2. The village of Guivilé, in the valley called Tulsi Khola, granted by *Saurada Yadava Nayaka*, to the good priest Ravaladeva of the Bhadraraja Gotra, as well as to Dobe, the son of Govind, and the same, with the exception of land yielding Nishkasor pagodas, is for ever consigned to the charge of Vishwarúpa Ráshi Guru, skilled in the worship of Pa-shupati or Shiva.

3. A grant by the abovementioned Vishwarúpa of two spots of ground, yielding four and three pagodas respectively, to Vasudeva Bháttá of Vatsa Gotra, the great grandson of Gadadhara Bhatta; and to Keshavadeva, the son of Damodura Trivedi, skilled in the three Vedas.

“The grant is composed by Váśudeva Bhatta, the grandson of the very learned Gadadhara Bhatta.”

8. This last inscription shows a somewhat curious circumstance, that eulogies of this kind sometimes commemorate different grants by different individuals.*

9. No. V, is an inscription, in corrupt Sanskrit, on a slab of stone in the Jaina Basti or temple, and its substance is as follows:—

Invocations to the laws of Jina and Arhata. In the race of Kshatriyas, descended from Shilhar, was born Naga (?), who had four sons, viz. Gonkala, Guisaha, Kirtiraja, and Chandráditya. From Gonkala was born Marasinha who was the father of five sons. Girvala, Gangadeva, Ballala Deva, Bhoja Deva, and Gandaraditya. A son of this last-mentioned prince named Vijayáditya is described in the pompous style usual in such documents; and among the other epithets applied to him are “the lord of Tagarapura,” and “one who had obtained his desires,

* I found another large stone with Sanskrit inscriptions upon it lying close on the ground by this gate. Half of it however had been broken and consequently I could make nothing of it.

through the favour of Shri Mahalakshmi," This Vikramaditya while residing in his tents at Valvād* and governing his kingdom in the enjoyment of agreeable society, grants one-fourth of the village of Havinaheralgee, and twelve cubits of land for building a house to Maghanandi and Mánikjanandi, Pandits. This grant is made solemnly by pouring a stream of water on the occasion of a lunar eclipse, which occurred on the 15th of Magha in the Shalivahan year 1065, called Dundubhi, and the object thereof is the performance of light kinds of worship to Parashwanath and the repairs of the temple consecrated, at Kshullakapur, by Vāsudeva, (master of the class of Múla Sangha and Fushkaraguchēna, and the disciple of Mágghanandi Sidhantadeva,) as well as the distribution of food to the devotees of the place and the service of ascetics bearing staves and pots. "The grant is made, under a written deed, after washing the feet of the two abovementioned priests. It should always be respected by the descendants of our royal race as well as other kings, &c. Vāsudeva bearing in mind the advice of his preceptor Maghananda regards this as the element of virtue."

10. While the preceding inscription was being copied, the transcriber was informed of the existence of a larger one buried under the same Basti. This (No. VI.) was accordingly opened, and found to be in the old Kanarese dialect, mixed up with a large number of Sanskrit epithets. Its contents may be given in a few words :

Invocation to the laws of Buddha. The race of Chilhar (Silhar) was sprung from Jimutavāhana, and the descendants thereof were lords of Tagarapúra (Kolapúr). One of these Gandaráditya resided in Valvad, Gandagopála was a worshipper of his feet. Gardaráditya and Vimbadēva follow, and both are celebrated as great rulers and pious devotees of Buddha ; but what relation they bore to the last mentioned king is not very clear. For the performance of eight kinds of worship to Parashwanath in the Basti of Madgadi, near Kavadi-golla, as well as for the repair of the said building, and the giving of food to saints, king Nimbadeva, in the presence of an august assembly of Shetties, including Bilwana Shetti of Kolapúr, and Biraja Shetti of Miraja (Meritch), Halia Shetti of Kavadi-golla, and a great number of others, held on Monday

* A village six miles from Kolapur, the Patelship of which is still held by a Jaina.

the 5th of Kartika Vadya, in the Shaka year 1058, called Rakshasa, makes the following grant, by solemnly pouring a stream of water, to the learned and pious Kupa Narayana, the priest of the Basti and the worshipper of Traividyadeva; viz. the right of receiving various taxes. Here follows a very long enumeration of taxes; viz. on betel nut, piece goods, vegetables, leaves, ghee, oil, shops, tents, &c. &c. the proportion being a small part of the goods brought to the market; for instance, 50 betel nuts in a load, $2\frac{1}{2}$ seers of oil in a pot containing that liquid; and a *Falam* or one-tenth of a pagoda on every cart of turmeric, garlic, chillies, pepper, &c. The grant concludes with denunciation of the five great sins on the head of any one who may even talk of the abrogation thereof.

No. VII, was found in another Basti near the Rankalé gate. Though the fragment herewith submitted contains but a portion of the original, the names of Gandaraditya, Nimbadeva, Vijayaditya and the priest Maghanandi occur in it. The nature of the grant does not appear; but it is said to have been bestowed with a view to procure happiness, prosperity, and the birth of a son.*

12. All these inscriptions taken together, establish two points of some importance. First, That the influence of the Buddhists over the provinces round Kolapur predominated in the eleventh century, and that it was altogether supplanted, or considerably diminished, in the succeeding centuries of the Shalivahan era. Second, That the followers of Buddhism, at the period under consideration offered reverence and worship to the local deities of the Hindus.

The present town of Kolapur is not older than the time of Tárábái and Shivaji. The records now discovered prove, however, that it was a place of some political consequence, and that its sanctity was in great repute, among the Hindus and Buddhists, upwards of seven centuries ago. I shall now mention some circumstances, which render it probable that it can lay a claim to a still higher degree of antiquity.

* The inscriptions No. IV and VII. being incomplete may not be deemed fit for being laid before the public in their present form. As I could not however expect paying another visit to Kolapur for the present, I have thought proper to take some notice of them with a hope that some of the people who are now residing on the spot, may be induced to favour us with more perfect copies.

14. Kalapúr,* called in Sanskrit Karavirapura, or Tagarapura, holds an exalted station among the holy places of the Hindus. It is reputed to be the representative of Benares in the Dekhan, and a description of its sacred spots, temples, and Tirthas or tanks, forms the subject of a large Mahatmya; which, like works of that kind, enumerates the different sages, who attained merit by practising austerities there in the former Yugas. The occupation of the same place alternately by Buddhists, Jains, and Hindus, as the head quarters of their religion, is a well known circumstance; and the existence of the remains of antiquity in the neighbourhood of the town in question, need not excite our surprise. These remains are to be found in abundance, and require only to be searched and studied.

15. The great temple of Mahalakshmi is a building evidently anterior to the modern style of Hindu architecture. The Shikhara or conical pinnacle, has been lately added to it by the Rajas, and it has not got the usual Hindu symbol of Ganapati in front to the present day. It belongs to the class of those dark, many pillared, oblong, stone-temples, so common in the south of India, and known in the Dekhan by the appellation of Hemádepanti; which, though probably not so old as the caves, must yet be regarded as the works of remote ages. A tradition is current that the image of Mahalakshmi was hidden in the house of a Brahman, during the religious persecution of the Hindus, and the appearance on the temple of one or two figures of Jain saints, in their usual attitude of prayer, finally determines the question of its Buddhistic origin.

Ever since the establishment of the Mahrathá Government at Kolapur, temples and other buildings have frequently been observed at different distances below the surface of the ground. Many of the present houses are believed to stand upon such remains; and the people have been so much accustomed to meet with them in digging down for the foundation of houses, that they now scarcely excite any surprise. The last discovery of this kind which was mentioned to me by a credible authority, occurred a few years ago during the construction of a ghat, or flight of steps, on the banks of the Panchaganga. The minds of the Hindus are ever prone to look for the marvellous, and therefore instead of as-

* The word Kolapur itself probably meant the same thing as Tagarapura. It owes its origin either to the Sanskrit word Kulbar or to the Canarese word Kolihu, both of which signify a lotus.

cribing these records of antiquity to their proper origin, they suppose them to be the abodes of the Rishis mentioned in the Mahatmya. This belief has led their imaginations to fancy the appearance of human figures and lamps in the dark caves accidentally laid open to their view; and, as it is natural to suppose that such beings, who have been engrossed in meditation for millions of years, would not like to be disturbed in their religious exercises, stories have been circulated of daring and officious intruders upon the sanctity of their dwellings having been turned blind, deaf, and dumb, the moment their curiosity was likely to be gratified. These tales are enough to deter the silly and the timid from attempting similar enterprizes; and the course usually adopted, on the discovery of subterranean buildings, is to cover them immediately, and to keep the circumstance as secret as possible. Such is the feeling of awe and dread with which the people are induced to behold these spots, that they have not the courage to visit and explore the contents of one or two caves about the town, which have been left open probably by the carelessness of those who first discovered them.

Notwithstanding this, a great number of fragments of pillars, slabs, and other specimens of masonry have been picked up at different times; and these, with inscriptions upon some of them, are to be found in different parts of the town. An interesting question then presents itself, at what time and by what causes was the ancient town of Kolapur, or some part of it, at all events, buried under the ground?

18. The supposition of volcanic agency, earthquake, or any similar subterranean cause, is inconsistent with the alluvial nature of the surrounding soil, and no prominent elevations, rents, or any unnatural arrangements occur. The bed of the river Panch Gunga is obviously too low in comparison to the situation of the present town, and too strongly checked by high and steep banks, to admit the conjecture that this stream could have destroyed any portion of it unless the same was considerably lower than what it appears to have been from some of the old buildings still standing. The cause to which we may ascribe the revolution in question, with some degree of confidence, is the reservoir Rankalé, which stands on a higher level than many parts of the town. This tank receives the whole of the water descending from a hill on its southwestern side, and being about a mile in breadth and nearly three miles in circuit, is known at times to have poured forth impetuous tor-

rents of water in the direction of the town, when its banks were not sufficiently protected. A flood of this kind is said to have extended to the western frontier of the suburbs, about seventeen years ago. The majestic bason gave vent to its overflowing contents through a small channel, which, as was believed at the time, was dug by some mischievous children playing on its banks; and the mighty stream destroyed the innocent miscreants, and swept away a number of houses, in the Shukarwar Penth, before its ravages were stopped by the Raja with his elephants, and by more durable embankments. I may mention also that the subterranean temples, inscriptions, and all the other records, are found in that part of the town, which lies on the same side as the lake; and nothing of the kind has been found in the eastern quarter, as far as I am aware.

19. When the important phenomenon adverted to in the above paragraph took place, it is impossible to determine. Tradition is altogether silent on the subject, and there is no other circumstance from which we might hazard even a conjecture. But as all the inscriptions, now brought to light, are dated in the 11th and 12th centuries of the Shalivahan era; and as most of these have been found under the ground, there is strong reason to conclude that the old town was in existence to the middle of the 13th century of the Christian era, and that its destruction must have occurred at some subsequent epoch.

No. I.

Translation of an inscription on a stone in the temple of the goddess Mahálakshmi.

1. Salutation to Mahálakshmi the goddess of wealth. May you receive protection from the remover of difficulties, (Ganapati); whose heart (lit. belly) is a reservoir for the nectar-like disposition to shed blessings upon the world; and the bright lustre of whose teeth, white as the *Jasminum Multiflorum*, dispels the gloom of ignorance and illumines all quarters. 2. May the king, Somadeva, with his queen Manikyadevi, be preserved by that goddess, who is an enemy to the Daitya race, and who, under different names and forms, such as Gangá, Brahmi, &c. averts the calamities of the three worlds, and has manifested herself on the earth in the shape of Mahalakshmi for the benefit of her votaries. 3. May prosperity attend the dynasty of the Chalukyas, of an untainted glory; which is the repository of every variety of excellence as the

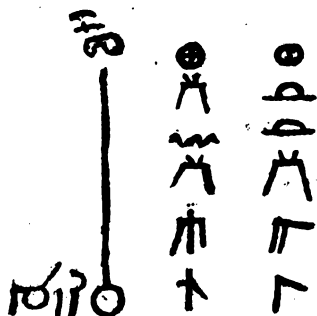
ocean is of gems ; and like the luminary of the day, is the only source of splendour, and whose fame is spread far and wide. 4. How is it possible to describe the character of the sovereigns descended from this house ; who were possessed of immense treasures ; and who being mentioned, other eminent princes are thrown into neglect. 5. We shall, nevertheless, extol some kings of this dynasty, who flourished at Sangameshwar in the Konkan, and were all celebrated for their good qualities. 6. In this family was born king Karna of an unspotted character ; who reclaimed the earth by his virtues ; chastised those Kshatriyas that did not do him homage ; obscured the moon by the fair fame of his liberality ; and propitiated the gods by performing various Yagnyas accompanied with liberal distributions of alms. 7. He was the sovereign of a great kingdom, and having gained five great titles, lived at Vijaypat, the best of eastern cities. 8. He made the lotus of the Chálukya house bloom on the earth ; his banners had the peculiar signet of a golden boar. 9. He was distinguished throughout (the regions bounded by) the seven oceans by the title of Nrisinh (lion amongst men), and was reputed to be a matchless hero, endowed with a noble and enterprising spirit. 10. He might be called an adamantine asylum for refugees, and was much devoted to the service of the gods, the Brahmins, and his superiors. 11. The earth was eminently fortunate in being blessed with this king, whose hand was always wet by a perpetual current of water in giving alms ; who was honoured in the assemblies of the learned, and who harassed his enemies by his daring exploits. 12. Whose armies were formidable in their march ; who was virtuous in his deeds and a store house of all blessings in the Kaliyuga. 13. And he was distinguished for his wealth, virtues, and fame. 14. His son Vetugideva was a repository of glory and was possessed of immense wealth. As the sun, by his strong light, is the pinnacle of brightness, so was he the very pinnacle of the requisite qualities of a king. 15. As long as he ruled over the world with the tenderness of a father, diffusing an unrivalled fame, his subjects were as happy as they were in the presence of the moon. 16. To him was born the best of kings, Somadeva, who rendered his dynasty illustrious as the moon does the end of the rainy season. 17. Having held the sceptre of his vast kingdom and rendered the earth prosperous, he repaired to heaven to adorn it by his virtues : but finding a vacuity on the earth, returned to it like the emblem of Shiva, which purifies great sins by the

sprinkling of water poured over it. 18. His younger brother Somadeva, was known in the three worlds by his glory, and the dread which he inspired into the mind of his enemies, through the favour of his spiritual preceptor Shrishána Shambhu. 19. He was like a lion to his elephant-like enemies, and Shamed Káma (god of love) by his handsome features; his deeds were virtuous; his bounty pure; his generosity unbounded. He possessed every admirable quality and was renowned for virtuous actions. 20. To him bowed the Suras and Asuras, whose heads were crowned with rubies. This king granted a village called Kubhar for the offering of fine Modakas, (a particular kind of cake,) every day to Mahá-lakshmi at her mid-day worship. 21. The village has been given over to the goddess by king Someshwara, following a fixed virtuous principle and aspiring to be ranked among the great and the pious. 23. Whoever will resume our former grant of land, house, &c. situated behind the Matha (monastery) of Kaladeva, shall be doomed to the infernal region called Raurava, and shall be guilty of destroying one hundred Lingas. 32. Many kings as Sagar, &c. have enjoyed the sovereignty of this earth; to whomsoever the earth belongs, to him belongs the fruit thereof. 24. He who resumes a spot of land given either by himself or by another, becomes a worm in filth, for sixty thousand years. 25. This short, but elegant and figurative eulogy, has been compiled by consent of king Somadeva, acting under the directions of his preceptor Shrishana Shambhu. May it prove auspicious. Written by Vedyadhar Pandit. May there be prosperity for ever.

Note by the Secretary. The *Yadava* family, mentioned in inscription No 2, is also noticed in a Hali-Kanari inscription, at Bijapur, of which an account will be found in Vol: 1 of our Journal, p: 572.—The *Silhara* family also of No 5, and the city of *Tagara*, have been made known to us by various copper plate-grants of land: one of which, that was found at *Tannah*, was translated into English, and published in Vol: 1 of the *Asiatic Researches*; and another, making mention of *Gokal Raja*, *Guwel Raja*, *Kirti Raja*, and *Chandra Aditya*, with other branches of the same family, was made public in Vol: III of the *Transactions of the Literary Society of Bombay*; p: 395.—The author, in the previous account of ancient inscriptions at Kolapur, wishes to identify this city with the ancient *Tagara*; which, at the time when Arrian's *Periplus* was written, or in the beginning of the second century of our era, was the great emporium of the Dekhan, to which all kinds of commercial goods were brought, and conveyed through the *Bala-Ghat* mountains to *Barigaza*, or *Broach*.—The true position of *Tagara*, or its identification with the modern *Daulatabad*

Plate XXII

Inscriptions copied from the Tubal Mukatib
near Wedj in 1831.



A
I I
These two characters are seen
in several places.

IYD+'+EE

Θ)ϕεεΔεεεεεεεε

ΛΛΛΛΛΛΛΛ

IY°
IYB'Y'

EF IYD, Q'Y
IYIYQodo

IY°

IYIYK

φ*θεεεεεεεε

ART. IV.—*An account of Sherm Wadj, in the Red Sea, with a notice of ancient inscriptions from Jabal Mukattib in the immediate neighbourhood. By Captain T. Carless of the Indian Navy and Assistant surveyor to the survey of the Red Sea from 1829 to 1834.*

Sherm Wadj is a small inlet, forming an excellent anchorage, on the eastern side of the Red Sea, in Latitude $26^{\circ} 15'$ north, where wood, water, and sheep, may be procured from the Bedwins at a cheap rate. The water is brought on camels from the ravines and vallies amongst the hills, a few miles inland, and is excellent. On the beach, close to the anchorage, there are six or seven rudely built storehouses or shops, from which the boats' crews frequenting the place, and pilgrims on their way to "Mecca," can obtain supplies of food and clothing; and on the cliff forming the north point of the inlet, the ruins of a fort are visible, but it does not appear to have been of any great size or strength, and is evidently of Arab construction.

From the plentiful supply of water, the country about Wadj is more fertile than any other part of the coast of the Red Sea above Jeddah, the vallies being full of small trees and bushes, and thinly covered with grass, one species of which, from its seeds being enclosed in long silky tufts, produces an appearance as if the ground were covered with fine down. Herbs and wild flowers are also observed springing up in profusion every where, and many of the latter, when in full blossom, are exceedingly beautiful, filling the air with their fragrance and affording to the cattle a most luxuriant pasturage.

has not been satisfactorily established, though *Phultamba*, on the southern bank of the Godaveri, and *Mungy Paitan* on the same river, clearly represent the *Pluthana* and *Paitana* of Arrian.—*Tagara* was ten days journey eastward of *Pluthana*, or about one hundred and ten miles, while *Kolapur* is more than 180 miles from *Phultamba*, being situated south-wards and considerably to the west of this ascertained position: the true situation of the ancient *Tagara* is therefore yet to be ascertained.—The *Callian* of Arrian is however without doubt, the locality known by this name on the mainland opposite *Salsette* and *Bombay*; where the Greeks, in the time of the *Periplus*, were prohibited from landing goods, and were confined in their commercial transactions to the harbour of *Broach*.

About six miles inland from Wadj, there is a small fort, situated upon a plain at the foot of the hills, belonging to the Pasha of Egypt, and garrisoned by a few of his troops. It is of a square form, strongly built with towers at the angles and gateway, mounts several guns, and serves not only to overawe the tribes in the neighbourhood, but also, as it lies in the direct route from "Syria" to "Mecca," as a place of refuge and succour for the pilgrims performing the Hadj. In its immediate vicinity, one of the principal routes from Wadj, into the interior, enters the mountains, and passes through several wild romantic ravines bounded by irregular crags of granite formation. At the entrance of the pass, the cliffs rise perpendicularly to a considerable height, and on those which have smooth surfaces, the face of the rock is covered with inscriptions in an unknown character. They are rudely cut, placed very irregularly and all very short, there being none, as far as I could discover, of greater length than those I copied. Niebuhr, if I remember right, mentions having seen them when travelling in this part of Arabia, and supposes them to be merely a kind of rude hieroglyphics cut in the rock to commemorate the arrival and departure of pilgrims, but in this opinion I do not agree with him, as they appear to me of great antiquity and a distinct character can evidently be traced throughout the whole, which bears some resemblance to the Ethiopic. From this I am inclined to think they are of Hamaiyaritic origin, for we know that even so late as the time of Mahomed's appearance, two distinct dialects prevailed in this part of Arabia, the Hamaiyaritic and Koreish, and although no records have been transmitted to us, to enable us to arrive at a satisfactory conclusion on this point, the former is believed to have borne a strong affinity to that language.

Nine or ten miles beyond the entrance of the pass, the road, after winding through several rocky ravines and beds of torrents, descends slightly and emerges upon a spot where the country for some distance is more open and the hills are much lower. Here the ruins of a large town are met with, occupying in clusters an extent of about a mile and a half in length, by three quarters of a mile in breadth, which the Arabs call Feyrabat, and assert was built by the Nasseranees or Christians. It is now so entirely in ruins, that heaps of stone alone remain to point out its site, and nothing whatever is visible from which an opinion might be formed as to its age or the people who built it, but some of the houses

have evidently been constructed entirely of marble, which is procurable in large quantities from the surrounding hills. One of these, not more than 300 yards distant, from its numerous extensive caverns and figures, is itself a great curiosity, and is said by the Bedwins, who are afraid to pass near it, to be the abode of all kinds of evil demons. If the inscriptions on the Jabal Mukattib, at the entrance of the pass, could be deciphered, they would perhaps throw a ray of light on the history of this town and its inhabitants.

All the Bedwins, with whom I have spoken on the subject, state, that throughout that part of Arabia, extending along the borders of the Red Sea from Akabah to Jeddah, and from 30 to 40 miles inland, the ruins of old towns are very numerous, and some of them also mention the existence of inscriptions, similar to those noticed above, in various places, but their descriptions are so vague and confused, that with my imperfect knowledge of the language I have not been able to ascertain the precise localities where they are to be found.

T. G. CARLESS,
Com. I. N.

Aden ; August 13th, 1845.

The Journal, from which this extract is taken was written in 1831, during the survey of the Red Sea, some years before the inscriptions found at Hassan Ghorab and other places on the southern Coast of Arabia were discovered. Those I copied from the Jabal Mukattib, near Wadj, appear to be written in a different character, but some resemblance is still observable between them, a few of the letters and the signs or characters marked A, being common to both, others again are merely the same as some of the Amharic letters now in use, and it will be seen that the inscriptions are written both horizontally and perpendicularly ; a peculiarity not observable in those discovered on the southern Coast of Arabia.

Note by the Secretary.—The town mentioned in the fourth paragraph of Art : iv, near which, in one of the mountains, are said to be extensive caverns and figures, seems to be the same as *Wadi-al-Kora*, on the Caravan route from *Damascus* to *Medina*. One of the inscriptions is in the Hamaiyari character of Southern Arabia, the others, mixed with Hieroglyphics, in the Nabathean character of the Syriac, similar to the inscriptions which have been deciphered by Professor Beer.—A bad copy of the inscriptions now sent by Captain Carless will be found in the Journal of the Geographical Society of London, Vol : VI p : 64.

ART. V.—*Notes on the agriculture of the Cherotar district of Gujarat.* BY LIEUTENANT COLONEL MELVILL, formerly of the Gujarat Revenue Survey.

The Cherotar is that part of Gujarat situated between the *Mahye* and *Sabarmati* rivers, and may be said to be bounded by a line roughly drawn from Ahmadabad to the small town of Oomret. It is the richest and most highly cultivated part of the Province; a character which it owes partly to the natural fertility of its soil, but in a much greater degree to the skill and industry of the Kunbies, who are its principal cultivators, and who claim this particular spot as that in which their ancestors first settled. All the agricultural skill of the country is concentrated here, and I have therefore thought that the following brief and imperfect notes may be of some use, as calculated to illustrate the system of agriculture which prevails in a province so celebrated for its fertility.

Soil.

Gujarat is well known to be an entire alluvial plain, an almost perfect level, and destitute of rock or stone, except in the neighbourhood of the hills which form its boundary. The soil has two marked divisions, *black* and *white*, called by the natives *kali* and *guraru*. The former prevails over all the southern, the latter over all the northern parts of the province. The black soil is known very universally throughout India, as black cotton ground; and is a rich loam, which, in the rains, becomes a mass of stiff ground, and in the dry season hardens and shrinks up, leaving deep holes and wide cracks. Its depth seldom exceeds six feet; and it is consequently adapted to those plants only which strike their roots along the surface, rather than deep down into the ground. The white soil is a light sand, more or less mixed with clay to the depth of ten or twenty feet, where a gravelly or sometimes a marly stratum appears, abounding in springs of water. It is a general remark throughout Gujarat that every spot of ground which is relatively *high*, partakes of the white soil, and *low* of the black; and so much is this the case, that in some parts of the country, the white soil is termed by the natives *Thulia*, or rising ground.

The soil of the Cherotar is almost entirely *guraru*; it is never equal, but sometimes approximates to the *marwa* land of the Jambusir Parga-

nah, on the southern side of the *Mahye*, which Mr. Marshall has described as a sandy loam of light brown, or *darkish* tinge, and the superiority of which he demonstrates, in his Statistical Report. An intermediate description of soil termed *besur*, neither wholly *kali* nor wholly *goraru* is common here, and used particularly for some kinds of crop. But the richest soil of all is the *bhata*, or land gained by alluvion on the sides of the broad beds which form the channel of all tropical rivers : of course this kind of land is of very confined extent.

Enclosures.

In the rich tract of the Cherotar, the fields are generally fenced with thick and luxuriant hedges, but, in most other parts of Gujarat, very little attention is paid to what an English farmer considers so important a part of his business. In the black soil indeed neither trees nor hedges thrive : and the cultivator is content to fence his field round with the thorny branches of the *bawal*, (mimosa,) during the time his crop is on the ground. At other periods, a narrow strip of unploughed land, marks the division of fields ; and sometimes there are scattered pieces of the milk bush, or prickly pear, along it, which strengthen the dry thorns, and form a more compact hedge, when the season comes round for renewing it. The white soil, on the contrary, is well adapted to the growth of hedges, but they cannot flourish properly on any but irrigated land, where they receive a constant supply of water during the hot season.

The usual size of fields, in the Cherotar, varies from five to twenty acres. The hedges seldom exceed five feet in breadth ; and crops of different kinds are frequently grown within the same enclosure. Rice lands, which require to be flooded, are enclosed with banks of earth about two or three feet high, and a foot broad. The sugar cane fields are guarded by thin walls of mud and straw, six or seven feet high, which completely encircle the field, leaving no aperture but a small hole just large enough to admit the body of a man ; and even this is placed at some height above the ground, and carefully blocked up with thorns. This wall is absolutely necessary as a defence against wild hogs, which are so voraciously fond of the cane that they will break through all ordinary obstacles in their way to it.

Draining and Irrigation.

The husbandmen of Gujarat have no knowledge whatever of draining,

and from the costliness of the operation, and the skill required in its execution, it will probably be one of the last operations of scientific agriculture, with which they will make themselves acquainted. I am not sure indeed, that it could be often applied with much advantage. The Cherotar is a part of the country, which suffers particularly from floods of water during the periodical rains; but individuals can do little towards remedying this, as each man by draining his own, would flood his neighbour's property; and effectual outlets for the superfluous water require to be carried to so great a distance, that the work, if done at all, must be done with public, not with private capital.

To store up the rain water which falls during the monsoon, and to distribute it over the fields during the dry season, is a more important part of Indian agricultural economy. Without the aid of artificial irrigation, a single crop only can be produced in the year; but on a field which has the advantage of being watered, three crops may be raised in succession. Again the single crop is always one of a common kind, usually that which forms the staple produce of the country; and, from its abundance, must always be cheap, as all the fewer and valuable species of crops require to be regularly watered for several months. If we add to this the uncertainty of the rains, which may be too heavy or too scanty, or may fall in an improper degree at particular periods, it is certainly not too much to rate the difference of value between what are usually termed the dry and the wet lands, as four guineas per acre. The quantity of irrigated land in Gujarat bears but a very small proportion to that which is not irrigated. From accurate statements, to which I have had access, I think it may be fairly stated in the Cherotar at a tenth part of the whole quantity of land in cultivation.

It is singular that throughout all this Province, there is no work of art of any magnitude constructed for this important purpose. The Rulers of the country apparently have never cared for the construction of aqueducts or reservoirs. Of common tanks there are abundance; but the tank is not well suited, in level countries, for irrigation; it is itself so dependent on the monsoon rain, and is always liable to fail, just at the time when it is most wanted. The stream of rivers again generally shrinks up to such a narrow compass in the dry weather, as gives little opportunity of applying the water extensively, without the aid of such expensive machinery as must be far beyond the means of Indian agricul-

turists. There is one little river, indeed, near Ahmedabad, called the *Khari*, of which much use is made; it is very narrow, and confined between mud banks, which for a long distance are so low, that a dam brings the water even above the level of the neighbouring grounds. These dams are curious; they are formed of earth only, and never go straight across, but wind with an unskilful and often ineffectual contrivance to break the force of the water, and thus prevent its pressing too much on any part. The muddiness of the water of this little stream renders it peculiarly valuable for irrigation.

We may safely say that at least three fourths of the irrigated lands are supplied with water from common draw wells.—Spring water is abundant in the Cherotar, and with the exception of a tract of country near the bank of the *Mahye*, the level of which is higher than ordinary, it can be procured, in abundance, at the depth of twenty or thirty feet from the surface. In digging wells, the first operation is to make a round excavation, about twenty feet deep, or until some appearance of water is perceived. A circle of wood, called a *Chakar*, made with great care, is then slipped to the bottom of the hole to serve as a foundation, and upon this the first layer of bricks is laid. As the building goes on above, the ground is loosened, and if it can be managed, dug up beneath, until the weight of the brick work causes the whole mass to sink, which it will do to the depth perhaps of ten feet, the water being drawn off each day as it rises, until the sinking can be carried no further. The work is then carried up to the surface, covered with a coat of *chunam*, and the well is complete. But if the depth thus obtained, be not sufficient to ensure a copious supply of water, a second circle of wood, called a *tundi* is fitted within the circumference of the first, and built upon, and sunk in a similar manner. In this operation the difficulty of drawing off the water, with sufficient despatch, is very great; and when, as is sometimes the case, it becomes necessary to insert even a third circle, the expense and labour is immense. In those parts of the well which are under water, the only cement used is a little clay, but the bricks must be fitted together with great nicety. In constructing the *chakar*, the use of metal, nails, or iron fastenings is avoided, and their place supplied by wooden pegs, to avoid the corrosion that would otherwise take place. Wells in the Cherotar are always made either of brick or of clay hardened in the sun called *kund*. In the neighbourhood of the hills on the frontier of the Province

stone wells are met with, but they do not answer well, from the difficulty of sinking them to a sufficient depth; for they cannot build them in the gradual manner of brick wells. Stone is better adapted to the construction of that kind of well called *bauli*, which has steps on one side, and is not intended to be used for irrigation; it consequently does not require to be sunk to any great depth, as it is not liable to be much drawn upon. A good brick well, perfect in every respect, and twenty feet deep, will cost in construction about two hundred rupees; if forty feet deep, five hundred rupees, and proportionally at intermediate depths.

The water is drawn up from wells in a large leather bag, made of buffalo's hide attached to a rope, to which a pair of bullocks is yoked. The rope is passed over a wheel fixed on cross sticks; and to assist the purchase of the cattle, an inclined plane is formed down which they walk, and thereby draw at a much more acute angle than they otherwise could. In a single well, several *Kos* may work at once according to its diameter; four is a very common number. I have seen eight and heard of fourteen. In working deep wells, called *Ramia*, two pairs of bullocks are usually employed to each *Kos*; when the first pair arrives at the bottom of the inclined walk, the bag is loaded by a man stationed for the purpose, and its contents discharged. The rope is slipped, and when the bag has again reached the water is fastened to the pair of bullocks at the top standing ready to receive it. It is curious to observe the men keeping count of the number of *Kos* drawn by passing little balls of clay from side to side of a niche in the bank. In working shallow wells, called *Sundia* only one pair of oxen is used, and a peculiar contrivance enables a single man to do all that is necessary. The *Kos* has, at the bottom of it, a long open pipe or trunk to which a second rope is attached, passed over the lowermost edge of the well, and joined to the principal rope just below the bullock's yoke. The length of this rope is so contrived, that when the bag is below the surface the end of the trunk is drawn up and secured, but as soon as it comes on a level with the top, the end is drawn inwards, and the water immediately discharges itself into the receptacle prepared for it. The *Ramia kos* is calculated to contain about 40 gallons of water, and the *Sundia* about 30; and 800 of either may be drawn in the course of a single day; and a single *kos* is calculated to be equal to the irrigation of 6 to 10 acres in a season.

The water on being drawn up, is received first into a shallow basin

lined with *chunam*, whence it flows into a narrow sluice also *chunamed* for a few feet ; but after this, the only channels used are of earth raised a little off the ground. The field is divided into little square beds, about 4 feet each way. The course of the water to different parts, is managed by one of the cultivators who diverts or directs its passage to particular spots by opening or damming up the channels with a little wet mud, which he carries in his hand for the purpose.

Implements of Husbandry.

There is only one kind of plough, known in the Cherotar, and that is the simple kind found all over India. The bar is usually a crooked piece of wood, and the small piece of iron used as the share, is the only metal about it. It is drawn by a single pair of bullocks, and scratches rather than ploughs the ground ; but it appears to answer every required purpose, in this country, where all experience shews deep ploughing to be quite unnecessary, if not absolutely injurious. In the very stiff black soil, the plough is not used at all, but in its stead, they have an instrument, called a *Ramp*, something like, I believe, a drag hoe ; it is a heavy bar of wood, about a yard long, to which is attached a blade of iron slightly curving inwards, in the shape of a crescent. It is drawn by four stout oxen, and cuts up and exposes all the surface of the ground, without penetrating to any depth, a practice of which experience has taught the agriculturists the utility.

All seed, with some trifling exceptions, is sown with the drill, here called *Turphun* : it is ingeniously contrived to sow several kinds of grain at the same time. Weeding is performed partly by hand, and partly with a rude harrow, having six or eight iron coulter or teeth ; there is also a *Kumbri* or ramp, a smaller kind of *Ramp*, used for the same purpose.

The only other implement of husbandry worthy of notice, is a large rough board, which is drawn over the surface to break the clods and smooth it preparatory to sowing. This is called a *Sumar* ; and fulfils very imperfectly, and with far more labour, the office of *Rollers* in England.

The rude manufacture of these farming tools may be judged from their value. The *Plough* costs about $2\frac{1}{2}$ rupees ; the *Ramp* about 3 rupees ; the *Drill*, 1 rupee, and the *Rampri* $1\frac{1}{2}$ rupees. The yoke and harness for the bullocks will cost perhaps an additional rupee in each case.

Manures.

The common manure of the Cherotar is cattle dung: every cultivator of any condition, has a stock of at least four or five cattle of one kind or another, the dung of which he preserves in some convenient spot, generally near his house. The compost accumulates, and is never disturbed until the season for using it comes round, when it is carried out to the fields in carts. No kind of care is taken of it, and much of its most valuable properties is doubtless dissipated in the atmosphere. The practice of folding cattle upon fields is quite unknown; they are driven out daily to graze, but the manure they leave behind, is not even collected, excepting for fuel, but left to rot and waste on the grazing ground. Sheep are not kept in any numbers, and their dung on which English farmers set so high a value, is consequently wanting.

On the sandy soil, they frequently use as manure, rich black mould taken from tanks or the beds of nullas; this corrects the looseness of the sand, and forms a mixed soil which is highly fertile; but the trouble and expense of digging it out and carting it are very great, and it is little used but for the very best and most valuable species of produce.

In the southern parts of the Province, the practice prevails of ploughing in the hemp plant when half grown; and it is found to answer as very good manure. The refuse stalk and leaves of the Indigo plant, after the extraction of the dye, are also very valuable for this purpose; but of course merely known to the greater part of the people, by report, as the growth of Indigo is so very limited.

In the wild woody countries, on the frontier of the Province, the *Bheels* are in the habit of selecting small spots in the jungle, on which they collect all sticks and leaves and set fire to them. The ashes are equal to any manure and sufficient to ensure a good crop for two successive seasons. The Hindus, and particularly the Kunbies, have a curious prejudice against this; they extend their reverence for animal, to vegetable life, which they say it is not lawful to destroy, unless absolutely required for the food and support of man. They refuse therefore to adopt this practice, though they are themselves aware of its utility, and it certainly would be a valuable improvement in the agricultural economy of those parts where brush wood is plentiful. A Kunbi of Viramgaum endeavoured to overcome the difficulty by procuring a Kuli to fire the fuel, which he had collected and spread over his field. He reaped an excellent

crop, but the caste expelled him, and he was obliged to go to great expense before he could get his character restored. The same prejudice would prevent the introduction of what is called, in England, paring and burning; it would probably improve both the loam and the sandy soils to a very great degree.

Common manure is not often sold, as few cultivators have any to spare. Its nominal price is usually about a Rupee per cart load.

Seasons.

Ordinary land yields but one crop in the course of the year; an irrigated field will produce two and three crops in succession, but never more. The agricultural year commences with Jeth or June; the *Dewali* or feast of lights, which occurs generally in October, marks the termination of the *Chumasia* or four rainy months, and the commencement of the *Sialu* or cold. The *Unalu* or hot season, is not so exactly defined, but may be called March, April, and May. The crops which ripen in October are called the *Kharif*; those which ripen in February are the *Rabi*; and in April or May, the *Hari*.

Productions.

The principal products of the Cherotar, are comprised in the following list. I have ventured to annex the proportionate extent to which the culture of each kind prevails, in decimal parts, supposing the whole extent of land under cultivation to be expressed by unity. I have drawn these proportions from the statements of the Revenue Survey; and, as they result from an actual survey and measurement of several *Parganahs*, I think they may be deemed to approximate pretty nearly to the truth. The botanical names I have drawn from various publications; but as I have myself no botanical knowledge, I cannot answer for their correctness;

Bajri, (<i>Holcus spicatus</i> .)	Sugar cane, (<i>Saccharum</i> .)
Jowar, (<i>Holcus sorghum</i> .)	Indigo, (<i>Indigofera tinctoria</i> .)
Kodra, (<i>Paspalum frumentaceum</i> .)	Poppy, for opium, (<i>Papaver</i> .)
Baota, (<i>Panicum frumen</i> :)	Tobacco, (<i>Nicotiana</i> .)
Rice, (<i>Oryza sativa</i> .)	Kussoombhee, (<i>Bastard saffron</i> .)
Wheat, (<i>Triticum</i> .)	Cotton, (<i>Gossypium</i> .)
Barley, (<i>Hordeum distichon</i> .)	Deweli, (<i>Ricinus communis</i>).
	Tul, (<i>Sesámum orientale</i> .)

Garden and other produce.

	Proportion.	Decimals
Bajri & Jowar,		0.63
Kodra, Millet, and poor grains,		0.15
Rice,		0.06
Wheat, and Barley,		0.05
Sugar cane, Indigo, and Poppy,		0.001
Tobacco,		0.002
Miscellaneous produce,		0.107
Total cultivated land,		1.000

Culture of Grains.

Bajri and Jowar are the staple grains of the Province, and for the production of which it has always been distinguished. They constitute the food of the larger part of the agricultural population; and are in fact the corn of Gujarat. Jowar is the proper production of the black soil, but grows also on *goraru*; bajri grows upon *goraru* only. To ensure a good crop, the land must be manured; and if any after crop be grown, the manuring must be repeated annually; otherwise once in three or four years is enough. The manure is ploughed in immediately after the first fall of rain; the *Sumar*, a substitute for the roller, is then drawn over the surface, and lastly it is harrowed. The seed is sown in July, and after the lapse of a month, the ground is well weeded, and the crescent shaped knife, (*Rampri*,) is drawn between the furrows to clear away any old stubble or weeds. When the crop is about a foot high, its growth is checked by drawing the *Sumar* over it, and passing the plough between the ridges, by which means a much healthier and more fruitful plant is produced. The grain ripens and is cut early in October; it is trodden out by bullocks, and the chaff separated by a very simple process, viz: a man standing on a high stool lets the grain and chaff fall together in a breeze of wind, which carries off the chaff in its passage, while the heavier grain alone reaches the ground.

With the bajri or jowar there is always sown a proportion of *Kuthol* or pulse, consisting of Mug, Muth, Chola, Urud, Wal (a species of phaseolus and other leguminous plants,) which come forward about a month after the other has been cleared away. The practice of thus mixing crops

is very general, and apparently a good one. In fields, which have not the advantage of irrigation, one or other kind is almost sure to succeed under the most unfavorable seasons; the stalks and leaves of the pulse afford a succession of the finest green forage, which, where grass, as in the Cherotar, is so very scarce, is of great value to the Ryot. The *Karbi*, or stalk of both bajri and jowar, is well known as nourishing food for cattle. The natives, for feeding their bullocks, prefer that of the bajri; but for horses, that of the jowar only is used by Europeans. The quantity of seed required to sow an acre of ground is 14 to 20 lbs, the *Kuthol* forming three parts in eight. The produce of the best kind of land is 1,700 lbs per acre, *Kuthol* included; on medium land the produce may be averaged at 1000 to 1200 lbs. Jowar is sometimes grown solely for the sake of the *Karbi*, which is finest in the poor lands, where the produce in grain would not repay the tillage.

Kodra, the various kinds of millet and other poor grains, are grown in the inferior *goraru* lands, and form the food of the poorest classes. They are sown and ripen at the same time as bajri; kodra by itself, is somewhat too strong a crop for the poor lands, and its value is too low to admit of its cumbering the richer soils; to correct this, it is generally sown in conjunction with *Tuwar* (*cytisis cajan*) which is found to be an ameliorating crop.

Baota is a singular grain grown in the *besur* soils, or those which are intermediate between the *kali* and *goraru*. It is sown first in seed beds, and afterwards transplanted to the fields, where it is planted by hand in furrows previously prepared by the plough. It ripens towards the close of the monsoon, and will not thrive on the same ground for two years in succession. It requires some manure, but the crop after all is not of much value.

Rice, as a subject of cultivation, is of novel introduction in Gujarat; and it is still too expensive to be used as food by the generality of the people. It first came into use about 60 years ago, when the manufacture of Indigo ceased. It is grown in *Kali* land, or in prepared beds of a kind of artificial soil, nearest in appearance to the *besur*, called *Kiari* or *Kaurda*. The seed is first sown in small beds, called *Daru*, of the richest loam that can be had. In July or August the plants are transplanted to fields which have been prepared for their reception by manuring, flooding, and ploughing. They must be kept supplied with an abundance of water,

and for this purpose, tanks or wells which can be resorted to, in the event of the monsoon rain not proving sufficient, are invaluable. The crop is harvested in October; the average produce is about 1,500 lbs per acre; the best land will yield as much as 2,800 lbs, and the worst so little as 600 lbs. The natives distinguish six kinds of rice, classed as follows:—

1st Punkhali, worth one rupee and two annas per maund.

2nd Kumod, worth one anna less.

3rd Haichi, worth one maund and eight seers per rupee.

4th Sutarsal, worth one maund and ten seers per rupee.

5th Wankla, worth one maund and twenty seers per rupee.

6th Sathu, worth one maund and thirty five seers per rupee.

The last is a coarse kind of rice, sown broad cast, in any low spot, and frequently without the use even of a plough, the ground being roughly broken up with a pick-axe or hand hoe.

Wheat is of two kinds, the *Waria*, or that grown with irrigation, and the *Chasia* or that grown without. Both kinds are barbed, a protection which is perhaps necessary to preserve the grain from birds; and both are sown in October, and reaped in February. The *Waria* wheat is grown as an after crop to *bajri* or rice; and as soon as the *Kharif* is cleared, the field is watered with the old stubble standing, which rots and answers in some degree as manure. The natives conceive it desirable that the seed should be as near the surface as possible, and accordingly sow it by hand, smoothing over the surface afterwards with the *Sumar*. Barley is treated precisely in the same manner; it is not so liable to blight as wheat, and it is on this account often sown with it in equal parts. The singular circumstance sometimes occurs, of the wheat being destroyed, while the barley comes forward to full maturity. The blight of the wheat is caused by excessive cold (*heem*), or the attack of a small insect called *Girwo*. About 140lbs of seed of either barley or wheat is required to sow an acre; and the return is about 2000 lbs. These crops are likewise grown on land which has lain fallow during the monsoon, in which case the crop is more abundant, but barley compensates for the loss of the *Kharif*.

The *Chasia* wheat is grown on low lands of the blackest soil, which in some parts, bears the name of *Gheonwar*, or wheat lands. The ground intended for it, must lie fallow during the monsoon, and be ploughed two or three times. Where it can be done, it is advantageous to dam the field round, so as to retain the water upon it; in the richest wheat coun-

tries, these fields are perfect quagmires during the monsoon. The seed, about 65 lbs per acre, is sown in October; the ground requires no weeding; weeds indeed do not readily grow on it, and the crop is ripe in January or February. In reaping, the plants are drawn up by the root, and not cut off as most other plants are. The average produce of an acre is about 700lbs. The quality of the *Chasia* is superior to the *Waria* wheat, but both are very inferior to that brought down from Malwa.

Culture of Sugar cane.

Sugar cane is a very valuable description of produce, which can only be grown in the better kinds of *goraru* soil, and with the aid of the very best water. It can be grown, on the same ground only once in four or five years, and it is consequently generally found in detached fields. It should be preceded by a fallow, and the ground should be constantly ploughed and kept very clean during the preceding years. In February the land is plentifully manured with dung and black mould, which must be thoroughly ploughed into it. The cane is propagated from cuttings, each containing three joints or knots, which are planted in small square beds previously prepared and flooded. The seed canes are placed lengthwise, in rows, at the distance of 15 inches, and each cane is two or three inches distant from its neighbour on either side. They are trodden in with the foot. The ground is watered plentifully every ten days, until the rains commence, during which no irrigation is necessary; but when the rains cease, watering recommences, and is continued at intervals of 15 days, until the cane reaches maturity, which is usually in January or February. When ripe, it is cut off near the ground, and the juice is expressed by a screw mill. This is formed of three rollers, the centre one the highest, and turned by bullocks. The rollers are grooved diagonally down, and fitting into each other so as effectually to crush the cane which is twice passed through them. The screw is always erected in the field and sunk under ground, to admit of the bullocks being conveniently yoked. The juice, as expressed, passes at once into a large earthen vessel, also under ground, where it remains cooler than in any other situation, and is not so apt to ferment and spoil. With as little delay as possible, it is passed from this vessel, into a large boiler made of iron, where it is boiled, and the impurities as they rise skimmed off, until it obtains a considerable consistence; it is then poured into a trough made of tiles, and left to

cool and granulate ; lastly it is put into *mathas*, or earthen pots, which when full weigh about 80 lbs each, and sold as *Gul* or raw sugar. It is often called *Gur* and *Jagri* in other parts of India. The screw mill is made of the wood of the *babul* (*mimosa*), which is peculiarly hard and tough : it costs about 25 rupees ; no metal is used about it, and it will not stand the use of more than two seasons.

There are two kinds of cane,...the white (*dholie*) and the red (*rathi*)—distinguished by their external colour. The *Gul* of the white cane bears a somewhat better price than that of the red, but a smaller quantity is produced from it. An acre planted with sugar cane is calculated to yield about 4000 lbs of the raw sugar.

Indigo.

Many parts of Gujarat were formerly celebrated for their Indigo. Beckman, in his history of Inventions, says that in 1633, Indigo was distinguished in Europe as Sirches, Chirches, Bejana, Begarm, and Gujarat Indigo. I do not know exactly what place Bejana may be, unless Bijapur, but Sarkhej is also mentioned in the Ayeen Akbary, as famous for its Indigo ; it was indeed a *bander* or emporium for this article, even prior to the building of Ahmadabad, when it was a large town of 18,000 inhabitants ; and named *Dakha bander*. The country about Kurrie and Jambooseer on the south of the *Mahye* also produced this plant extensively. About 50 years ago it began to be discontinued, as its price, from the superior manufacture of the Bengal planters, had declined so much as to take away nearly all profit from its culture, and it is now scarcely grown at all. The *kunbies* * have some prejudice against it, on account of the animalcule, which they supposed to be destroyed in extracting the dye from the leaves. There is a prejudice also against Tobacco ; but their prejudices either bend or break when the kunbies see any palpable advantage before them. The kunbies of the Virangam Parganah entered into a general agreement, about 60 years ago, to discontinue the culture of Tobacco ; and according to the custom of that country, had the agreement transcribed upon a stone, and deposited in the ground ; but the culture of the plant has recommenced, and is rapidly spreading, as they find they can derive great profit from it.

Goraru is the soil suited to the Indigo plant ; it does not require very good land ; indeed it improves land, and no manure is necessary unless it

* The Gujarat name for a Cultivator of the soil.

be grown in company with some other plant. The seed is sown with the drill, (50 lbs per acre,) in July, and the plants are ready to be cut in September. Careful weeding is all that is necessary in the mean time. The plants are cut about a span from the ground, and as vats are seldom to be had within a convenient distance, they are usually carried home, and the leaves made up into balls to be sold in a dry state. But it is far better to extract the dye from the fresh leaves with all the farina upon them. When this can be done, the plants should be carried off the field early in the morning, and laid in a vat, which must then be filled with water, and heavy weights placed at top to keep the plants well under. When fermented, which is the work perhaps of a night, the water is drawn off into a second vat, where it is worked up with large sticks; this operation is intended to separate the salt of the plant from the colouring matter, and requires the greatest skill and attention to say exactly the proper time when they are separated, as if long continued they reunite and cannot be again divided. When declared to be sufficiently stirred, which is judged by the colour of the water, it is allowed to stand quite quiet until the next day, when the water is drawn off into a third vat, and the sediment at the bottom collected. This sediment is first tied up tightly in bags, and suspended from the branches of trees to allow still more of the water to drain from it; it is then spread in small lumps upon a cloth under a shed, where it dries, and the process is then completed.

The refuse, dregs, and the plants after steeping, make excellent manure. An old Indigo field is never ploughed up the succeeding season, until the rain has fallen, as the roots and cut stalks, if allowed to rot in the ground are very beneficial. An acre of the Indigo plant is expected to yield upon an average 40 lbs of the prepared dye.

A few acres of the poppy have been lately cultivated in the Cherotar and found to answer very well. The experiment has not been made on any scale sufficiently extensive to admit of an opinion being formed relative to its success. The treatment of it is derived from Malwa, and it is not therefore worth while to give any detail here of its management.

Tobacco.

The natives have very vague ideas, or rather no ideas at all, as to whence the culture of Tobacco has been introduced. That its introduction is of modern date, we have every reason to conclude, from the identi-

ty of the name, and the circumstance of such a production not being mentioned by any of the old authors who treat of India, nor is it even to be found in the Ayeen Akbary, when the other crops of Gujarat are minutely enumerated. And yet it is strange, that the use of this weed should have spread so universally amongst all classes, as to have become almost a necessary of life.

The tract of land where the Tobacco of the Cherotar is chiefly grown, lies between Pitlad, Neriad, and Kaira. It is grown either with or without irrigation; the former is called Peet, and yields the largest quantity, the latter is termed Korant, and produces the finest quality.

The Peet Tobacco is grown in *goraru* soil, which is prepared for it by manuring, ploughing, and good dressing. The seed is first sown in small beds, just after the first fall of rain, and the plants are transplanted into the regular fields, after the lapse of a month or a month and a half. In planting, a large rake (*Jesli*), with 3 or 4 wooden teeth, about two feet asunder, is dragged over the field first lengthwise and then across, so as to divide it into small squares; and a plant is set at each intersection of the lines. The young plants require to be well watered for some time until they take good root, and this must be continued, at intervals of 10 or 15 days, until they have reached maturity. The plant must not be allowed to flower, and all the buds, as they appear, must be carefully nipped off, in order that the leaves may not be deprived of any of the sap which gives them their flavour. The crop takes about six months to ripen thoroughly; in the mean time, it is particularly exposed to be injured by excessive cold in December or January, and by the rain which often falls just when the leaves are plucked and laid out to dry.

The Tobacco is cut from the middle of February to the middle of March. The produce is classed in two sorts, the *kaleka*, and the *jurdo*. That which is thought good enough for *kaleka* is first cut down, stalk and all, and placed in rows to dry; it is allowed to remain thus on the field for 10 or 15 days, when it is tied up, moist with the dews in early morning, and carried home as expeditiously as possible. To secure the produce of an acre is the labour of eight days, and to pack up the leaves in a fit state for sale occupies 12 days more. The leaves which remain after the *kaleka* is cut, are plucked from the stalk, and laid on the ground to dry for 12 or 15 days. The large and the small leaves are separated, and made up in bundles with layers of each alternately.

The cultivation of the Korant tobacco is conducted in the same manner as that of the Peet. The ground must be well ploughed and manured during the monsoon, but it is only low moist soils, of a peculiar nature, where this crop can be grown. An acre of the Peet is more valuable than one of the Korant, for the difference of quantity in the one more than makes up for that of quality in the other.

There are properly four kinds of Tobacco, the Tulubdee, Khandeshee, Haechee and Gandeeo, each of which is classed again into *haleka* and *jurdo*. The kind produced depends more on the skill and care of the cultivator, than on the nature of the soil; brackish water for its irrigation is preferable to sweet. This Tobacco is found to be of too mild a quality to have any value in an European market—but I think it is questionable whether it might not be submitted to some preparatory process, which might enable it to endure the passage and preserve its good qualities. The Tobacco of America, I believe, is made up in little bundles, which are steeped in sea water, twisted in the manner of ropes, and then formed into rolls by winding them with a kind of mill round a stick.

Miscellaneous Produce.

The Kussoombhee, or Bastard Saffron, is sometimes grown for the sake of its flowers, which are used in dying as those of the real crocus are in Europe. The plant thrives best in *besur* or mixed soil, and requires manure and previous dressing. It is sown in October or November, and flowers, without irrigation or much care, in January. The gathering is made in the cool of the morning, and the flowers are sold, just as they are, to people who make it their trade to bring them up. Sometimes the cultivator keeps them, and sells them in a dry state, but this is disadvantageous to him. The seed which they call *kabree*, is a valuable article as food for cattle, to which it is found to be very nourishing. An oil is also extracted from the seed, which is used for adulterating other oils, but is itself of very inferior quality.

Cotton, in the Cherotar, is not much attended to; the plant grown here is a triennial, yielding no gathering the first year, and its best crop the last. It is usually sown in conjunction with *bajri*, or *baota*, in the proportion of seven drills of grain to one of cotton. An acre will yield at the utmost 400 lbs, and 800 lbs may be an average crop. This is the uncleaned cotton; cleaning reduces it to one fourth of its former bulk. In the Broach district the loss is only two thirds.

Deweli, the castor oil plant, and Chuna (*cicer arietinum*), gram, are crops generally used as fallows: their value being too inconsiderable to admit of their culture in other situations. They are sown at the close of the rains and reaped in January or February. Tull is another ameliorating crop, and is used as a preparation for bajri or jowar.

The Gardens of the Cherotar are merely enclosures, to which the means of the owner enable him to bestow a more than ordinary portion of manure, and constant watering. He then grows a variety of country vegetables, chilies, ginger, garlic, &c, and plentifully bedecks the walks with plantain plants. Plantains are grown as a regular field crop on the low grounds along the bank of the Sabarmati river, but I have never seen them in any other part of the Cherotar, and they are, I believe, very uncommon. Gardens can only be profitable near Towns, where there is a constant market for such produce.

Expenses of cultivation.

I shall venture to subjoin here a rough calculation of the expense attending the culture of each kind of crop compared with the return in produce. The only method of fairly estimating the expenses of cultivation is to consider the Ryot as a hired labourer, and to include every charge that he would be entitled to prefer, were he hired to till the lands of another. In reality the seed is perhaps the only article actually paid for in cash, as weeding, reaping, and all the labors of the field are performed by the Ryot himself or his family; but the prime cost of bullocks and stock, and the wear and tear of agricultural implements must be considered as entering in due proportion into the calculation.

	Expenses of cul- tivation per acre		Return valued at per acre
Bajri or Jowar	10 Rs	...	25 Rs
Kodra	5 "	...	15 "
Baota	10 "	...	24 "
Barley or wheat	18 "	...	30 "
Chaseia wheat..... ..	7 "	...	20 "
Sugar cane	180 "	...	350 "
Tobacco	40 "	...	90 "
Kussoombhee	20 "	...	60 "
Deweli, Tull, &c	5 "	...	18 "
Rice	20 "	...	50 "

The following is another rough estimate of the increase of seed. This affords a fair ground of comparison between different parts of the same country, but in comparing the fertility of different countries it may be erroneous; because superior skill may effect a saving in the quantity of seed, and produce even larger crops on land of only equal fertility.

Bajri from	125 to	20 ;	average	36 fold.
Jowar	„ 50 „	5 ; „	25 „	
Kodra	„ 110 „	3 ; „	40 „	
Baota	„ 300 „	50 ; „	160 „	
Barley	„ 20 „	5 ; „	14 „	
Wheat	„ 15 „	5 ; „	10 „	
Pulses	„ 24 „	8 ; „	20 „	
Rice	„ 100 „	25 ; „	50 „	

Markets, Roads, &c.

There are several little Towns in the Cherotar, which afford the cultivators a constant market for their produce of every kind. For its conveyance there is a cart road between every village, and though often very sandy and heavy, it is always passable, and easiest perhaps in the monsoon. This is a peculiarity, and an advantage attaching to the white soil: the roads over the black soil are always impassable by wheeled carriages after heavy rain. The carts of the Cherotar are small and ill made. The wheels are very broad, in order to adapt them to the sandy roads, and therefore their appearance is perhaps more clumsy than it otherwise would be. These carts are long and narrow, such as are here called Rurocwa. Those which come down from Malwa and Mewn, and those used in Khatiawar are very superior to the Gujarat carts. They are called the Pat Garoo, and carry nearly a hundred maunds, or about four thousand pounds; the platform is made to extend beyond their wheels, and it is thereby rendered much more capacious. In the Khatiawar carts, the platform is quite flat, but in those of the northern and eastern provinces, it is curved or rather arched, a contrivance which must add much to its strength. The only cattle used for draught are oxen, which, in the Cherotar, are of the Pattan breed, the largest and finest perhaps in India.

ART. VI.—*Abyssinia, Eastern Africa, and the Ethiopic family of languages, reviewed.* By the Secretary.

The Church Missionary Society of England, influenced by nobler views and higher motives than that superstitious credulity and sectarian zeal, which, in the end of the fifteenth century, led the Portuguese to select Abyssinia and the Eastern Coast of Africa as a field for Missionary labours, wisely turned its attention to the Abyssinians in the year 1829; since which time the Rev. Samuel Gobat's *Abyssinia*, the Journals of Messrs. Isenberg and Krapf, and the excellent *Amharic Dictionary and Grammar* of the former, with the vocabularies of the *Dankali* and *Galla languages*, have added much to our knowledge of the Geography and Ethnology of this interesting quarter: where the Abyssinians, already Christians, and possessing the *elevated plateau* of S. E. Africa, with a fine climate and productive country, naturally claim our sympathy and interest. Neither must we omit to notice Dr. Edward Ruppell's travels in Abyssinia, Sir William Harris's *Highlands of Ethiopia*, Johnston's travels in Abyssinia, Ignatius Pallame's travels in Kordofan, and Dr. Beke's Geographical communications to the London Society; which, while they bring prominently before us the claims of these countries to public notice, leave much to be desired, as yet unexplored, relative to the physical aspect and geology of the several countries, and the Ethnological relations of their inhabitants and tribes. It is almost a subject for regret that England and Englishmen should have borne so small a part in elucidating their Physical Geography and Ethnology; and relative to the Botany, Zoology, and local Geography of Abyssinia, we may expect to receive much additional and accurate information from the labors of the French Naturalists, M. M. Petit, Quartin—Dillon, and M. Vignaud, who, during the scientific expedition, commanded by M. Lefebvre, and sent into that country about five years ago, made extensive Botanical and Zoological collections, of which the results have not yet become public. M. D' Abbadie has supplied us with the most interesting account we have yet received of the Abyssinian family of tribes and languages; while Mr. Salt's vocabularies of languages spoken in Eastern Africa, and the publication, by the Royal Geographical Society of London, of Dr Beke's dialects of Abyssinia, may in some measure serve to redeem the character of our

countrymen from absolute indifference to this extensive and highly curious field of Ethnological research.

Abyssinia is an Alpine region of mountains, consisting of an immense *plateau*, of which the mean elevation ranges from 5,000 to 8,000 feet, and presents on its eastern and southern quarters, towards the Red Sea, and a portion of S. E. Africa, two great steepes. The lower country bordering the former, and resembling in many respects the low country on the opposite coast of the Red Sea, or the *Arabian Tahama*, is a sandy inhospitable region called *Samar*; from which the traveller ascends the lofty hills of Assauli and Taranta into the Upland, or North Easterly Abyssinian province, called Tigré, of which Adowa is the present capital; though Axum be the more ancient and interesting one, which gave the name of *Azumita* to all the inhabitants of this quarter who spoke the *Giz* language, or original dialect of the Ethiopic, into which, soon after the Nicæan council, the sacred scriptures were translated. This Province and the neighbouring one of Amhara westward are divided into several districts, the general character of which is mountainous, varied by deep and abrupt vallies; where the fountains of the rivers Mareb, Taccazé, and Abai, or Bahr-al-Azrak, commonly called the Blue Nile, discharge their waters north-westward into the plain of Senaar, and join the Bahr-al-Abiad, or White River, at Khartum. This is the most southern limit probably of the Ancient or Lower Ethiopia; which, from the time of Juba to the Emperor Diocletian, was inhabited by tribes of wandering Arabs, called *Blemmyæ*, mixed with the African *Nobatæ* or Nubians. The general character of *northern* as well as *southern* Abyssinia is much alike, and consists of extensive undulating plains, traversed by higher mountain masses, deep vallies, and numerous rapid torrents, which uniting their waters, in their course over the elevated *plateau*, become at length rivers of magnitude, flowing to the north-west. In *southern* Abyssinia, however, the general decrease of steepness and inclination of the country is in an opposite direction, or to the south-east, so that the rivers Hanazo*

* The separate existence of the *Hanazo*, except as an affluent of the *Hawash*, (*Journal of the Royal Geographical Society*, Vol. : xiv p. : 72) has been lately called in question by the Rev. : Mr. Trew, who thinks that the *Hanazo*, as the recipient of the *Milli* and *Ala*, may be identified with the *Hawash*. Ludolph, however, on the authority of Gregory, positively asserts that the *Hanazo* rises in the Abyssinian province of Angot, and the *Hawash* near Fatagar, situated more southerly; and there is much reason for thinking that this infor-

Hawash, and Wabi terminate in three salt water lakes on the eastward; while the Juba, or Gojab, joined by its affluent the Kibbi, opens to itself a passage on the Coast of Zanzibar, and debouches in $0^{\circ} 30'$ south latitude.

The Wabi and Gojab rather form part of South-Eastern Africa than of Abyssinia: which latter country, from its graduated elevation, approaches in climate to the temperate countries of Europe; while in its valleys many tropical plants are produced, which assimilate its vegetable productions with the hottest parts of India. Some of its most elevated districts, as the *Talba Waha* mountains of Gojam, and the Provinces of Simen and Lasta, possess a very cold climate, and are visited by tempests of rain and thunder; during the prevalence of which *hail* sometimes falls in large lumps, and is known by the name of "*beredo*." The low lands along the coast of the Red Sea, known by the name of *Samar*, or pastoral districts, and those, on the south-east, occupied by wandering tribes of Gallas, are parched with extreme heat; except during the period of our winter from November to March.

The mountains on the eastern side of Abyssinia, and which are not far W. of Ategerat, in latitude $14^{\circ} 16' 26''$ north, are elevated more than 8,000 feet above the sea, and form the water-shed between the Takazé and those streams which flow east-ward to the Red Sea. From Ategerat Dr. Ruppell, on the 1st of June 1832, saw the snowy tops of the mountains of Simen, and confirms an event, mentioned by the Adulitic inscription of Cosmas Indicopleustes, that Ptolemy Euergetes had subdued Northern Abyssinia, and "Semene, among mountains difficult of access and covered with snow." The water-shed between the Abai, or Nile and the Hawash and other rivers flowing S. E., has been determined, by Dr. Beke, along a line of nearly fifty miles northward of Ankober; and appears to exist in the Chaka mountains, which give rise to an affluent of the Abai called Chaka.

In the Ethnography of Abyssinia we obtain a connecting link between the Semitic tribes of Asia and Chamite nations of Africa; and though the

mation is correct. The *Wabi* is the same river as that which has been called, by Lieutenant Christopher, Haines River; and the *Juba*, or *Gojab*, is that which is called by Ludolph the *Zeb*: which is said to rise in the Province of Enarea, and after embracing the adjoining country of Zendero, or as Dr. Beke calls it *Yangaro*, falls into the Indian Ocean near Mombas.

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MO	SIX	SEVEN	EIGHT	NINE	TEN
m te	soou saggour	shashph zeramah	shmen samhai	psit ogamhai	met togoserama
iei in an igt	seds gorjou gorjoka walta "	sâ kalat koladka lamta "	thâm idou idouka sota "	th'soo ishot oskoda sicha "	marau dimnou dimaka sakka "
h ti a	sittah sadsati " sadati "	sabauah sabati " sabati "	thamaniah samanati " samanati "	tisah tasah " zataga "	ashrah ashrah " asar "
i he h	lehe leh ja	melhein tdubba turbo	bahhara sedeid seddet	sagalla saggal saggal	tabbana tubban koodan
ai	erde "	barde "	kuonkeda "	kuuntel "	kunllakudde "
mal	setta	sabba	naany	paindar	roomee

re ne

vy, collected in 1811.—James Bird.

publications of Messrs Isenberg and Krapf, the vocabularies of Dr. Beke, and the communications of M. D' Abbadie, afford ample means of comparison, the subject is yet far from being exhausted, and definite classification is perhaps premature, if not impossible. Two physical types, however, according to Dr. Ruppell, seem prevalent among the Abyssinians, from which he excludes the Gallas and Shangallas, as they are distinct from the original Abyssinian race. The first of these types, allied to the *European*, and characterizing those woolly haired races of Africa, with round faces and rather thick lips, exhibits the transition from the Negro to the Syro-Arabian type of countenance; and the latter being altogether of the Negro type, distinguishes all the black races, which, under every variety of aspect and of colour, are classed by the Arab Geographers from the *Zangi* to the *Nuba*, and is denominated *Ethiopian*. A round or oval face, a pointed nose, a well proportioned mouth, moderate thick lips, and lively eyes, resembling the Bedwins of Arabia, mark the former type of countenance, which pertains to the inhabitants of the high mountains of *Simen*, the *Agas*, the *Falashas* or Abyssinian Jews, and the *Gimant* inhabiting Woggera, and the neighbourhood of Gondar. The *Ethiopian* type, represented by a somewhat flattened nose, thick lips, dull heavy eyes, strongly crisped and almost woolly hair, marks the wandering tribes of *Bisharin*, the *Ababdeh*, and *Berbers* of the Nile: between whom and the modern *Copts* a remarkable similarity of physical aspect may be traced, while the grammatical peculiarities of their various dialects show them to be of one original stock; though the latter, by their more frequent admixture with races of Semitic origin, approach nearer to the modified *European* type.

The following Table of dialects, spoken by the several tribes who were or now are in possession of the countries of Abyssinia and the Nile, will enable us to establish, however imperfectly, such a classification as may be useful in tracing the historical changes that have taken place in these regions, and in investigating the difficult subject of Abyssinian Ethnology. In our yet imperfect knowledge of many dialects, spoken by the tribes of Central Africa, the assumed classification of their cognate affinities may be premature, and perhaps erroneous, but we adopt it in the absence of a more perfect one, which time and further investigation can alone supply.

The *Bisharin* and *Ababdeh*, placed on the northern confines of

Abyssinia, and occupying part of the eastern Nubian desert, between the Nile and the Red Sea, extend along the latter; from Lat: 16° to 24° north, and neighbourhood of Koseir. They are the descendants of the *Beja*, or the *Bajaditæ*, a nomadic people, who inhabited the Egyptian desert eastwards, and are called, in the Greek inscription of *Aeizana*, king of the *Axomites* and *Homerites*, *Bougæi** ΒΟΥΓΑΕΙ; who possessed the gold, silver, and emerald mines of that quarter. Their language, which is of importance, and has been made the subject of learned comment, by *Lepsius*, in the proceedings of the Berlin Academy of Science,† has much in common with the grammatical system of the Coptic, and has adopted some of its words, while it borrows frequently from cotemporary dialects of the *Falasha* and *Agawi*. It has, above all other living languages a title to be styled Ethiopian; and was probably the cultivated dialect of Lower Ethiopia, when *Ergamenes* was king of that country, and the soldiers of *Candacé*, queen of *Meroe*, were driven back from *Assuan* by the Roman and Greek troops of *Ælius Gallus*. *M. Lepsius* is of opinion that this is the language of the inscriptions, recording public acts of the government of *Meroe*; and which are abundantly met with in various localities of the Nile valley as far northward as *Philœ*.

The marked affinity of this language with the Coptic is characterized by its making use of the same signs, for the masculine and feminine, as the Egyptian; namely *b* in place of *p* for the former gender, and *t* for the latter. Like the Arabic and *Giz*, the *Bisharin* or *Beja* language, not having *p* in its original alphabetical system, substitutes *b* in its stead for the masculine article, which, after the manner of the Copto-Egyptian language, is frequently transformed into the indefinite article *ou*; though most of the words are made feminine and the definite article *t*, prefixed. The *Amazigh*, or ancient Lybian speech of the wandering tribes of the *Sahrâ*, (or great desert,) manifests the same fondness for the use of the feminine article *t*, or *th*, as is observable in the *Beja* language; and this is one among other proofs shewing the cognate origin and original connexion of the *Berberas* of Egypt and the Nile with the *Berbers* of Mount Atlas, and Western Africa. *Ibn Khaldûn*, in his history of the

* See account of the Hamaiyaric Inscriptions in the Journal of this Society Vol.—II page 34.

† See meetings of the Academy, for Nov.—1844, reported in L' Institut des Société's savantes en France et à l' Etranger, No 115-116 Juil—Aout 1845.

Berbers, has examined this question with much care and learning, and maintains decidedly the opinion of this affinity, and that the *Berbers* are brothers to the Abyssinians, Copts, and Nubians;* while others have denied this affinity, but on insufficient grounds.

In Beja or Bisharin the word for *sun* is *toin*, consisting of the feminine Coptic article with $\Theta\Upsilon\omega\iota\iota\iota$ *light*, being when thus compounded *t—ouoini*, signifying *the light* or *the sun*. Both in Coptic and Bisharin the original word, without the article, is the Hebrew and Arabic عين *Aayn*, signifying *the eye* and *the sun*, or the source of vision; similar to the Coptic word $\rho\epsilon$ *re*, *the sun*, of which the original appears to be the Hebrew ראה *rah*, *to see*, or the *source of light*. The Beja word however for *the eye* is *tolele*, which is a compound again of the Egyptian feminine article *t*, with the original *yel*, *aval*, or *il*, of the *Agawi*, *A-mazigh*, and *Somali* languages. The Bejawi *toy*, or *the day*, is also an evident corruption of the Coptic *ta-hoou*, which has the same signification: and other cognate affinities of these two languages might be given, though those quoted will be sufficient for the present to establish the validity of the opinion here adopted, that *Coptic* and *Bisharin* are languages of the same original stock, and that the latter is the latest derivative.

In the tenth and eleventh century of our era, the capital of the Beja territory was *Aizab*, or *Aidab*, عيزاب , situated more than a degree and a half south-wards of the ancient Berenicé; or in latitude $22^{\circ} 8' N$; on the western shore of the Red Sea. In the time of the geographer El Edrisi, A. D. 1154, it was a city and emporium of considerable importance, where a deputy of the Egyptian Sovereign and of the Beja Chief resided to collect the revenue, and divide it equally between these two ruling powers.† The Bejas, and their descendants the Bisharin and Ababdeh, are of the same original stock as the *Blemmyæ* of the Romans, who, according to Strabo, were below the parallel of Meroe, possessing, along with the *Megabari*, the whole of the eastern bank of the Nile, towards the Red Sea; while the western bank of the river was possessed by the Nubæ, a great nation of Lybia, not subject like the former to the kingdom of Ethiopia, but obeying several distinct governments of their own. The same authority informs us that the Egyptian exiles, who

* See Travel's of Ibn Batuta, translated from Arabic into English by the Revd. Samuel Lee B. D. p: 17.

† Edrisi Africa: Curavit Joannes Melchior Hartman, p: 78.

revolted from the authority of Psammiticus, as recorded in a Greek inscription, yet existing on the leg of one of the colossal statues, in front of the great cave of Abu-Simbal, were named *Sembritæ*,* or the strangers, and inhabited an island, or peninsula, distinct from Meroe, situated, as appears, between the Atbara, or Oriental branch of the Nile, called Astaboras, and the Astapus or modern Abai, which had its source from a lake on the south.† This emigration from Egypt into Ethiopia is mentioned by Herodotus ;‡ who calls those who migrated Egyptian warriors, instigated to revolt, as would appear, in consequence of the marked preference shewn by Psammiticus II. (B. C. 600) to the Greek mercenaries, who had restored him to his throne and kingdom ; while his Egyptian subjects were disparaged, by being placed on all occasions on the king's left, and the post of honour on his right assigned to the Greek troops. Thus, with the arts and manners of Egypt, this migration seems to have introduced civilization, if not the Coptic language into Ethiopia ; and it is a subject of much interest to trace the yet existing remains of this Egyptian dialect in the Beja and other African languages, of which the *Amazigh* is probably the most ancient. This latter language only exhibits, however, remote resemblances to the Arabic, though the voice of tradition is agreed that the Berbers of the Nile and those of Western Africa, are descendants of Kush, who was the brother of Canaan, though Arab authors call him his son.— It is impossible, perhaps after a lapse of more than two thousand eight hundred years, to find intimate cognate affinities between the Coptic, Arabic, Amazigh, and African dialects, though it be certain that in the time of Shishak, king of Egypt, and Rehoboam king of Judah, B. C. 970, the *Cushim* were in possession of Lower Ethiopia, and are mentioned, in II. Chronicles, ch : XII. ver: 3rd, along with the *Lubims* and *Sukkiims*, or the *Lybians*, and *Trogodytes*, west of the Red Sea.— Soon after the times of Isaiah, ch : XLV. ver : 14, a branch of the Syro-Arabian people, with the name of *Cushites* migrated, B. C. 769 to 729, from the kingdom of Midian, in Arabia, to the western shores of the Red Sea ; and from this period frequent migrations to the same quarter of the Syro-Arabian family seem to

* This is a derivative compound word, from Coptic, namely *shemmo*, a foreigner, and *beri*, new, meaning “ new comers.”

† Strabonis Rerum Geographicarum Liber Decimus Septimus, par. 2.

‡ Herodotus Book II para : xxx.

have taken place, and to have introduced into the African dialects a great many Semitic words.

The *Amazigh*, besides making use of the Coptic *article*, and *prefixes* for the cases of nouns, exhibits a well marked affinity between its pronouns and those of the Coptic: and, having several words in common with the *Kanuz* and *Nuba* dialects of the Nile, these three languages may be most appropriately classed as a *Lybian family*, distinct from, but not altogether unconnected with the *Egyptian*; since Herodotus tells us that the languages of the Ammonians, or those inhabiting the Oasis of Siwah, (Al-wah) west of Egypt, was a mixture of that of Egypt and Ethiopia.* The following are some of the best marked affinities of the *Coptic* and the *Amazigh* pronouns:

<i>English</i>	<i>Coptic</i>	<i>Amazigh</i>
he	netof	netoo
she	netos	nettath
they	nethou	nateen
to thee	nak	enak
to him, to her	nas	eenas
to us	nan	nanaa.

These are sufficient to establish the remote affinity and connexion of these very ancient languages, the modern dialect of which, called *Ertana*, spoken by the wandering tribes of Towarik inhabiting *Siwah* and *Augila*, or Eastern portion of the Sahra (great desert,) is closely allied on one side to the *Amazigh* and to the *Coptic* on the other, while it has many words in common with the *Kanuz* and *Nubinga* dialects. In the *Ertana* *aman* signifies *water*, and *ázail* or *asal* the *day*; while in *Kanuz* these words are respectively *amanga* and *asalki*, having terminations that are peculiar to the latter dialect. Again the Coptic word *eiót*, which signifies father, appears in the *Ertana* with the article as *teeat*. We might multiply examples of the cognate affinities of these dialects, with a view of establishing the *Lybio-Egyptian* origin of the tribes speaking them; and in this opinion we are indeed supported by the voice of History and Geography: for both Pliny and Pomponius Mela† call the people *Libægyptii*, thus plainly asserting their mixed origin.

* Herodotus Book II. paragraph XLII.

† Pomponius Mela, who wrote a book on Geography, flourished about the forty fifth year of the Christian era, and preceded Pliny more than thirty years. The words of the latter, relative to the situation of the *Libægyptii*, are, "Interiori

The next family group of languages has a better and more exclusive title to be considered *Abyssinian*, as having occupied at one time the whole of this ancient kingdom, north and south, previous to the irruption from the south of the pagan Gallas; who, under their leader Mahomed Graan subdued the southern Abyssinian province of *Fatagar*, about the year of our era 1526, and soon after overran the whole of Shoa Proper, or southern Abyssinia, including the districts of *Shoa*, *Efat*, *Giddem*, *Efrata Geshe*, *Waraka*, and other places situated N. W. of the river *Hawash*; while various other African tribes got possession of the yet moresoutherly districts of *Zingera* or *Yangara*, *Enarea*, *Kaffa*, *Worata*, and *Wolaitza*, situated near the sources of the various affluents which flow southwards to form the river Gojáb. The oldest member of this Abyssinian family of languages, styled *Giz*, is a very pure dialect of ancient Arabic, closely allied to the Arabic dialects of *Mahrah*, and those spoken by the mountainous tribes of southern Arabia dwelling near *Hasik*, *Morbat*, and *Zafar*; and approximates much more to the *Hebrew* and *Syriac* than to the *Arabic*. It appears to have been the prevailing language of the country at the time the Abyssinians were converted to Christianity; and being of *Syro-Arabian*, or Semitic origin, has been improperly termed *Ethiopic*: an appellation which belongs more appropriately to a nation of mixed Egyptian race, situated on the banks of the Nile, between Khartum and the parallel of Assuan or the ancient *Syené*. These are the *Ethiopians Proper*, who spoke the same language and worshipped the same gods as the people of the Thebaid, or Upper Egypt; and who, in the time of Ptolemy Evergetes, were ruled by their king *Erkamen* or Ergamenes, whose name, in Hieroglyphics, is written along with that of Ptolemy, on the temple of Dakkah in Nubia; to the east of which that chain of mountains, running across the eastern desert to the Red Sea, may be said to begin; and is now in possession of the Bisharin, who are the modern representatives of the true Ethiopians. From the first conquest of the country along the banks of the Nile, from *Syené* to *Meroé*, this territory appears to have been debateable ground between the Greek and Roman rulers of Egypt and the Ethiopians; with whom various tribes of nomadic Arabs, or *Troglodytæ*, were mingled soon after the

ambitu Africæ, ad meridiem versus, superque Gætulos, intervenientibus desertis, primi omnium Libægyptii; deinde Leucæthiopes habitant. Super eos Aethiopicum gentes Nigrîtæ, a quo, dictum est, flumine. Plinius lib: V cap. VIII.

latter people had been rendered tributary by Ptolemy Evergetes. In the reign of Diocletian, A. D. 283, these nomadic tribes of *Ethiopian Arabs* had become so formidable and harassing to the Roman garrisons of Upper Egypt, that the Emperor made a treaty with the *Blammyæ* and *Nobatæ*, who engaged to defend the frontier in consideration of an annual sum of gold paid to them: and from these once formidable marauders are descended the Kanuz and modern Berbers of the Nile.

The *Habash* or Abyssinians, whose Arabic designation denotes a people of mixed origin, have therefore improperly assumed to themselves the name of *Itiopiawan*, or Ethiopian: and appear not indeed, under their first national appellation of *Axumitæ*, much before the time of Frumentius, A. D. 325, when they were converted to the Christian faith; though *Æizana's* Greek inscription, at Axum, dating so late as A. D. 356, shews them to have been still pagans and worshippers of the Grecian deities. In the beginning of the second century of our era, Arrian, in his *Periplus of the Erythrean Sea*, makes mention of the royal city of the *Axumitæ*; of which and the neighbouring country of Barbaria *Zoskales* was sovereign, an accomplished prince well acquainted with the Greek language and literature. Not long after this period *Æizana* had reduced to his power the scattered tribes of the desert; among which, in Salt's Greek inscription from Axum, are mentioned the *Bejas*, and *Taguie* or people of *Taka*, who are situated N. W. of *Arkiko*, between the river *Takazé*, and the Red Sea. If we may credit the authority of *Masudi*, this *Æizana* or *Azaneah*, of the race of the *Amalekites*, and the son of *Sumaida*, was appointed by the Romans king of the *Axumites*; and soon after carrying his arms into southern Arabia, he rendered tributary the race of *Hamaiyar*, and their king *Zu-Yazan*:* and this information is indeed confirmed by the Greek inscription, wherein *Æizana* is called king of the *Axumites* and *Homerites*. Not long after this period, during the reign of the Emperor *Justinian* A. D. 528, the *Homeritæ* having quarrelled with, and killed some of the *Alexandrian* merchants, engaged in the Indian trade, the *Axumitæ*, or *Abyssinians*, un-

* *Masudi*, on the Arab tribes of the desert, in his "Meadows of gold and mines of jewels." He erroneously makes *Zu-Yazan*, a king of the *Homerites*, cotemporary with *Æizana*: for he was, as would appear, the son of *Zu-Nawaus*, and cotemporary with *Caleb* the *Abyssinian* Emperor who subsequently invaded Arabia.

der their chief *Elesbaan* again made war on the *Hamaiyar Arabs*: at which time, as would appear, Nonnosus was sent by the Roman Emperor on an embassy to both people. From the history of this Mission we learn that while *Elesbaan** ruled the Abyssinians, *Kais* his cotemporary governed the Arab tribes of *Chinda* and *Maad* on the opposite coast:† and about the same time *John*, a man of piety and character, was sent by *Justinian* to be Bishop of *Axum* and *Abyssinia*.‡ The Ethiopic inscriptions on the reverse of the Greek tablet at *Axum*, have reference to this event, and record that *John* taught from the neighbourhood of the River (*Nile*) the *Sabeans* of *Hazramaa*; but the two several invasions of Arabia by the Abyssinians have been confounded together in the history of the country; and the king *Atzbeha*, or *Aeizana*, is erroneously identified with *Caleb* who reigned after him several years.

The modern inhabitants of *Tigré*, or the chief district of Northern Abyssinia, speak a corrupt dialect of the ancient *Giz*; which was the vernacular dialect of the *Agaazi*, who founded the kingdom of *Axum*, and were the original of that mixed race known by the name of *Habash* or Abyssinians; of whom the greater part were of Syro-Arabian origin, as proved by the cognate affinities of their language and by history. The early connexion and commercial intercourse of the people of this country with those of Southern Arabia, will sufficiently explain the extension of the Jewish religion and customs throughout this country, with the introduction of the syllabic form of the *Hamaiyaric* alphabet: which, as a derivative from the *Phœnician*, was employed by the Abyssinian Jews and Christians for the publication of the Holy Scriptures into *Giz* or Ethiopic, after the former had learned the use of Greek vowel signs from reading the Septuagint, or Greek version of the Bible.§ How long the *Agaazi* had existed as a nomadic tribe, previous to their asso-

* This appears to be a title and not the name of the Abyssinian king then reigning, who was *Caleb*; and is composed of the Arabic article *El*, and the *Giz* word *Atsbeha*, the blest. It was also given to *Aeizana* two hundred years previous to this time, and hence has arisen the confusion which exists in Abyssinian history relative to the accounts of the two separate invasions of Arabia by the Abyssinian kings.

† *Nonnosi Historia ligationum*, in *Photii Bibliotheca* page: 6.

‡ *Bibliotheca Orientalis Assemani* vol. N. p: 453.

§ Origin of the *Hamaiyaric* and *Ethiopic Alphabets* in this volume of the *Journal* page, 66.

ciation with other neighbouring tribes under the Government of Axum, and their subsequent conversion to Christianity, is, in the absence of any authentic history of their early condition, a matter of doubt. They are first mentioned in the Adulitic inscription of the time of Ptolemy Evergetes ; who, from the Greek inscription discovered amidst the ruins of the ancient Berenice,* and his name in hieroglyphics on the temple at Dakkah, already mentioned, is known to have subdued and rendered tributary the true Ethiopians of this quarter. While some have affected to doubt the truth of events recorded in the Adulitic inscription, it is wonderfully confirmed by the records previously mentioned, for Ptolemy appears to have extended his dominion over Lower Ethiopia, and into the country now called Abyssinia. Along with the nation of Gazé are mentioned the Ath-agai or Agaus, the Bega or Bejas, the provinces of Agamé, Ava or Avergale,† Samen, and others now forming parts of Northern Abyssinia.

The Agaazi kings of Axum being succeeded by the Zagean family, about A. D. 925, the seat of government was removed from Axum to Lasta, while a descendant of the original royal race fled to Shoa. Three hundred and thirty years after this period, or A. D. 1255, the banished representatives of the Agaazi royal family were restored to the throne of their ancestors, in the person of Icon Amlac ; when the Amharic or modern Abyssinian dialect, which prevails in Shoa, and in the province called Amhara, situated between *Shoa*, *Gojam*, *Bagameder*, *Lasta*, and *Angot*, came into common use, and to the exclusion of the *Giz* ; of which it is a derivative, and from which it has borrowed the twenty six *Giz* consonants and seven orders of letters, with the addition however of seven peculiar orders of letters, which serve to express sounds not existing in the *Giz*, but which are familiar to the surrounding African dialects from which the Amharic has adopted forms and words. It is not, as Mr. Isenberg observes in his Grammar, an original but a derived language ; presenting all the characteristic features of Arabic and other Semitic languages, in the prevalence of biliteral, trilateral, and quadriliteral forms, though not in equal force as its parent the *Giz*. It enters extensively into the Adari language or dialect of Har-

* Wellsted's travels in Arabia vol. ii. page, 337.

† On the eastern bank of the river Takazé, and inhabited by a tribe of Agaus.

rar, south-west or *Zaila*; into that of Gafat, spoken in the southern parts of Damot and Gojam; and into that of Argobba, on the eastern and north-eastern skirts of Shoa. To any one acquainted with Hebrew or Arabic it will be a comparatively easy task to acquire a knowledge of this language through the aid of Mr. Isenberg's well arranged Grammar and Dictionary; which will be of invaluable assistance to future Missionaries and Travellers sent to enlighten and explore Abyssinia. Monsieur D'Abbadie, in his account of the Abyssinian languages, considers Amharic a *sub-semitic* dialect, and the Agawi *hamtonga*, or a genuine African dialect; in which opinion he appears to be correct.

The next class of languages, named Shoho-Dankali, belongs to a people occupying the tract of country between the Abyssinian *plateau* and shores of the Red Sea; the original tribes of whom, named Shoho and Hazaorta, mingle with the Habab and Bisharin on the north, in the latitude of Arkiko $15^{\circ} 40'$. From thence they extend south-wards to Tadjurra, in latitude $11^{\circ} 58'$; where they join the Somal and Ittoo Galla tribes; who appear to speak languages of the same original family as the Dankali; considered both by Isenberg and D'Abbadie to be *sub-semitic* in their origin. The latter has analyzed the grammatical structure of the Shahawi dialect, and acquaints us that the word *Shoho* is a Tigré word corresponding in meaning to *nomade*; though the people who speak this dialect and the corresponding one of *adali* near Tadjurra, call themselves *Afar* عفر, which may be a corruption of the Arabic *Aufir* اوفر signifying red, and may have been applied to designate the red Nubian race from which the *Danakil* people drew their lineage; which they trace to ancestors who descended from the highlands of Abyssinia. The cognate affinities between the words and numerals of these three languages may seem to justify the opinion, that the *Somali*, who inhabit the coast of Berbara from Zaila to Cape Hafun, and the coast of Ajan from thence south-wards to the mouth of the river Gojab, are of the same original stock with the *Danakil* and *Gallas*: but we have reason to believe, from both philological and historical evidence, that the *Somalis* like the *Adail*, or southern tribes of the *Danakil*, are chiefly of Arabian origin, and descended from Arabian tribes; who, according to Makrizi, fled from Aden Hej: 611, A. D. 1214, and traced their origin to Ali the son of Jafar Sadik. It is for this reason that the Ad-ali, or royal tribe of the *Southern Danakil* have obtained for all

the tribes the general name of Adail, and caused *Zaila*, the capital of these Mahomedan Arabs, to be generally known, in the beginning of the thirteenth century of our era, by the name of Adel. Ibn Said-al-Maghribi, quoted by Abulfeda, and who visited Egypt, A. D. 1250, says that they were then ruled by Shaikhs; and that in Hej: 617, A. D. 1220, that irruption of the *Damadem*, or Tartars of Soudan, first took place, by which the kingdoms of Nubia and Abyssinia were overrun and ravaged. By the *Damadem* of the Arabian Geographers and Historians, no other but the Galla tribes can be meant; and Ibn Said-al-Maghribi acquaints us that at this time they issued from the south, where their original country was situated between the equator and two and half degrees of north latitude. It is from this period that the intercourse between the Danakil and Galla tribes took place, by which the *Shawi* and *Adail* dialects of the former became adulterated with Galla words.

Arabian writers extend the name of *Jiberta* to the province of *Efat*, or *Wafat*, and the six other provinces composing the once flourishing kingdom of Adel; which, in Hej: 700, A. D. 1300, or about the time when the Agaai royal family of Abyssinia had been restored, was ruled by Sabr-ad-Din surnamed *Walshama*, a tributary of the Christian Abyssinian Emperor: between whose successors and their Mahomedan subjects, a fierce war broke out, which in the beginning of the sixteenth century of our era led to the division and ultimate ruin of the Abyssinian kingdom, that opened to the Gallas an opportunity of subduing its southern provinces, and obtaining the superiority already noticed.

In the national character of the Danakil, who are Mahomedans, excepting a small Christian division named *Taltal*, considerable difference between the northern and southern tribes is observable. Mr. Isenberg describes the former as generally vigorous, robust, fierce, and boisterous; while the latter are of shorter stature, of less expressive countenance and vigorous constitution, being shy, timid, and reserved. Between them and the *Somali* tribes, who are also Mahomedans, and have adopted Indian words into their language, there is a marked resemblance of physical aspect and general character. Most of the *Somalis*, who lead a Bedwin life, and are strictly a race of shepherds, without fixed habitations, are said to resemble the Arabs of Nejd. The Gallas who call themselves *Ilma-Orma*, or children of a foreign race, differing from the Abyssinians, seem to be of an intermediate physical type, between the

Arab and the Negro. They consist of numerous tribes, occupying the country on the north and west behind the Somalis and the Adail; and are generally Pagans, though some of the tribes have embraced Islam. Their religion is a monotheism defaced by many superstitious notions. They adore a Supreme Being, *Wak*, (originally heaven,) possessing all the attributes of God, whom they worship by prayers and sacrifice; they are much given, like the Shamanists among the Tartars, to the practice of astrology and augury. Their priests are named Kalitshas, who go about carrying with them a whip and bell; and their occupations are chiefly agricultural and pastoral, though in some of the villages, weavers, tanners, potters, leather cutters, and metal workers, to provide the necessities of civilized life, are occasionally met with.

In grouping together the language of the Shangallas, or Negroes of the Takazê, and the dialect of Gonga, a small and low district south of *Bure*, along the river Fatzam in the province of Damot, we have assumed rather than ascertained their cognate affinities, and place them together as a *Soudanian* or Negro family. The natives of Gonga, according to Dr. Beke's information, retain a tradition of their former existence as a separate state, and occasionally apply the name of Gonga to the low country on both sides of the river Abai,* in the southern quarter of Damot before mentioned. The Gonga word *aba*, signifying *sun*, is an evident corruption of *awa*, or *wa*, found in several African languages with the signification of the *sun* or *fire*; and has been doubtless derived from the Giz word *waayé*, which means a *burning fire*, or *fervent heat*. But the specimens of this language, now in our possession, are yet too few for instituting any satisfactory comparison of it with other African dialects, such as those of *Kaffa*, *Woratta*, and *Wolaitza*, which are said to be closely connected with it. It is not improbable, however, as Dr. Beke supposes, that S. W. from Guragie, where the cognate dialects of the Amharic seem to terminate, there was previous to the irruption of the Gallas, one original language prevailing throughout the table land, now occupied by these invaders; and that this was cognate with both the Shangalla and Gonga languages.

From the mouth of the river Gojah, or Juba, to Cape Delgado, and tenth degree of southern latitude, the coast of South-eastern Africa is inhabited by Mahomedans; who are of mixed Arab and Negro race, and

* Journal of the Royal Geographical Society of London, vol. xxiv. p. 39.

are named *Sowahilis*, or inhabitants of the Coast. Their language is called Sowahili, and is a derivative from the dialect spoken by the *Makua* Negroes, who inhabit the Coast of Mozambique, from the mouth of the Zambezi river to the neighbourhood of Melinda; where they are intermixed with and lost in their descendants the Sowahili race. The Makuas are, as would appear, a branch of the Monjous, a Negro nation of the interior which figures in the early Portuguese accounts of this Coast as part of the celebrated kingdom of Mono-Motapa: relative to which and the former state of commerce on the Coast of the Golden Sofola, many questions of deep interest are open to the investigation and research of future travellers.

ART. VII. — *Hygrometric Tables.* By PROFESSOR ORLEBAR.

Professor Apjohn's formula and determinations being now satisfactorily established, and the British Association having determined that barometric observations might now be corrected for moisture, I caused tables to be formed from those calculated by Major Boileau in order that our observations might be reduced at a single inspection. The use of the Observatory was the only object which I at first had in view, and tables II and III were formed entirely for ourselves. Subsequently I considered that by forming table I, I could very much facilitate the calculations of observers and surveyors at greater heights. And as these three tables will, I think, be of considerable assistance to meteorologists and also facilitate very much the use of the barometer in determining heights, it seems to me that they may be published in the Society's Journal with considerable advantage to the public.

Major Boileau's elaborate tables are calculated to five places of decimals, mine only to three; because barometric observations are taken only to the third decimal of an inch, and our thermometers are not made with sufficient accuracy to warrant at present any closer calculation.

In order to use Major Boileau's tables it is necessary to use three tables; my object was to combine all these into one.

Upon these two principles I have formed the present tables in order to enable an observer by inspection or very easy calculation,

1st to reduce the observed pressure of the barometer to the pressure of dry air.

2nd to ascertain the amount of moisture in the air.

3rd to ascertain the relative humidity.

Where the barometer does not fall below 29.5 nor rise above 30.1 inches, Tables No. II and III will supply all these requisites. These Tables therefore will serve for all places along our sea coast and throughout the low land of Guzerat and Scinde.

The method of using them will be best understood by an example: Suppose the barometer to be 29.746, the dry thermometer $80^{\circ}.2$ and the wet bulb 73° . Hence the depression will be $7^{\circ}.3$ —Look along the top of the table for 7° and along the side of the table 73° then opposite to those we find

0.724

Subtract .003 on account of 703

then 0.721 is the pressure and measure of the amount of moisture in the air.

Subtract this from 29.746

then 29.025 is the pressure of dry air. Now refer in the same manner to table III and 0.90 will be found to be the relative humidity of the air on the supposition that saturation is expressed by unity.

In using table II it must be observed that for every tenth of a degree of depression .001 must be subtracted from the number in the tables. In like manner a proportional part must be added for every decimal part of a degree of the temperature of the wet bulb, the amount of which will be easily seen by inspection: thus had the temperature of the wet bulb in the above example been $73^{\circ}.6$ then the pressure for 7° depression would have been

0.726 not 0.724.

It is not possible to give a general rule for this correction, because, as will be seen on inspection, the correction for 1° is nothing at low depressions, and as much as .020 at high depressions and low temperatures. This correction will however be easily supplied by the eye.

Table I is made in order to facilitate the calculations of similar

tables to II and III for any particular heights. The table itself will be easily understood after the former explanations. It will be observed that the only depressions calculated are 0° , 10° , and 20° . The interpolation between these will be quickly and accurately performed by the following formula

$$\text{correction} = .01147 (d-d') \frac{p}{30}$$

d is the nearest depression of the table, d' the given depression, and p is the barometric pressure of the table nearest to the barometric pressure of the place. Regard must be had to the sign of $d-d'$ that is, if d be greater than d' the correction must be added, if d be less than d' the correction must be subtracted

Example: Barometer is 24.800 wet bulb 60° the depression is 8° ; then

$$\begin{aligned} \text{the correction} &= .01147 \times (10^\circ - 8^\circ) \frac{25}{30} \\ &= .01147 \times 2 \times \frac{25}{30} \\ &= .01147 \times \frac{5}{3} = \frac{0.57}{3} \\ &= .019 \end{aligned}$$

but by the table depression being 8 and wet bulb 60° , the moisture pressure is 0.430. Hence the required pressure is $0.430 + 0.019 = 0.449$.

I hope that this table will facilitate not only the reduction of meteorologic observations but also enable surveyors to use Barometric observations with greater certainty. For, the inconsistent results between observations in using this very ready method of ascertaining heights are doubtless owing partly to the neglect of other meteorologic conditions, but more especially to the want of certainty with regard to the hygrometric correction.

After thus calculating from Table I a table similar to Table II, the meteorologist will have no difficulty in calculating Table III. He will take the logarithms of the numbers in the columns under 0° depression, and subtract them from the logarithms of the numbers under the other depressions, and the remainders are the logarithms of the numbers which express the humidity.

Tables I and II were calculated wholly by Keru Laxamon. Table III was calculated partly by Keru Laxamon and partly by Dinshaw Dorabjee, assistants in the Observatory.

TABLE I.

Pressure of Moisture under Barometer pressure 20 to 30 Inches for depression and Temperature of Wet Bulb.

t° Wet Bulb	20.000			21.000			22.000		
	0	10	20	0	10	20	0	10	20
50	0.373	0.298	0.223	0.373	0.294	0.215	0.373	0.290	0.208
51	0.386	0.311	0.236	0.386	0.307	0.228	0.386	0.303	0.221
52	0.400	0.325	0.250	0.400	0.321	0.242	0.400	0.317	0.235
53	0.414	0.339	0.264	0.414	0.335	0.276	0.414	0.331	0.249
54	0.428	0.353	0.278	0.428	0.349	0.270	0.428	0.345	0.263
55	0.442	0.367	0.292	0.442	0.363	0.284	0.442	0.359	0.277
56	0.457	0.382	0.307	0.457	0.378	0.299	0.457	0.374	0.292
57	0.473	0.398	0.323	0.473	0.394	0.315	0.473	0.390	0.308
58	0.489	0.414	0.339	0.489	0.410	0.331	0.489	0.406	0.324
59	0.506	0.431	0.356	0.506	0.427	0.348	0.506	0.423	0.341
60	0.523	0.448	0.374	0.523	0.445	0.366	0.523	0.441	0.359
61	0.541	0.466	0.392	0.541	0.463	0.384	0.541	0.459	0.377
62	0.559	0.485	0.411	0.559	0.482	0.403	0.559	0.478	0.396
63	0.578	0.504	0.430	0.578	0.501	0.422	0.578	0.497	0.415
64	0.597	0.523	0.449	0.597	0.520	0.441	0.597	0.516	0.434
65	0.617	0.543	0.469	0.617	0.540	0.461	0.617	0.536	0.454
66	0.638	0.564	0.490	0.638	0.561	0.482	0.638	0.557	0.475
67	0.659	0.585	0.511	0.659	0.582	0.503	0.659	0.578	0.496
68	0.681	0.607	0.533	0.681	0.604	0.525	0.681	0.600	0.518
69	0.703	0.629	0.556	0.703	0.626	0.548	0.703	0.622	0.541
70	0.726	0.652	0.579	0.726	0.649	0.571	0.726	0.645	0.564
71	0.750	0.676	0.603	0.750	0.673	0.595	0.750	0.669	0.588
72	0.775	0.701	0.628	0.775	0.698	0.620	0.775	0.694	0.613
73	0.801	0.727	0.654	0.801	0.724	0.646	0.801	0.720	0.639
74	0.827	0.754	0.681	0.827	0.751	0.673	0.827	0.747	0.665
75	0.854	0.781	0.708	0.854	0.778	0.700	0.854	0.774	0.693
76	0.882	0.809	0.736	0.882	0.806	0.728	0.882	0.802	0.721
77	0.910	0.837	0.764	0.910	0.834	0.756	0.910	0.830	0.749
78	0.939	0.866	0.793	0.939	0.863	0.785	0.939	0.859	0.778
79	0.970	0.897	0.824	0.970	0.894	0.816	0.970	0.890	0.809
80	1.001	0.928	0.856	1.001	0.925	0.848	1.001	0.921	0.841
81	1.033	0.961	0.889	1.033	0.957	0.881	1.033	0.953	0.874
82	1.066	0.994	0.922	1.066	0.990	0.914	1.066	0.986	0.907
83	1.100	1.028	0.956	1.100	1.024	0.948	1.100	1.020	0.941
84	1.135	1.063	0.991	1.135	1.059	0.983	1.135	1.055	0.976
85	1.171	1.099	1.027	1.171	1.095	1.019	1.171	1.091	1.012
86	1.208	1.137	1.065	1.208	1.133	1.057	1.208	1.129	1.050
87	1.246	1.175	1.103	1.246	1.172	1.095	1.246	1.168	1.088
88	1.286	1.215	1.143	1.286	1.211	1.135	1.286	1.207	1.128
89	1.326	1.255	1.184	1.326	1.251	1.176	1.326	1.247	1.169
90	1.367	1.296	1.225	1.367	1.292	0.217	1.367	1.288	1.210

TABLE I. — *Continued.*

t° Wet Bulb	23.000			24.000			25.000		
	0	10	20	0	10	20	0	10	20
50	0.373	0.286	0.200	0.373	0.282	0.192	0.373	0.279	0.185
51	0.386	0.299	0.213	0.386	0.295	0.205	0.386	0.292	0.198
52	0.400	0.313	0.227	0.400	0.309	0.219	0.400	0.306	0.212
53	0.414	0.327	0.241	0.414	0.323	0.233	0.414	0.320	0.226
54	0.428	0.341	0.255	0.428	0.337	0.247	0.428	0.334	0.240
55	0.442	0.355	0.269	0.442	0.351	0.261	0.442	0.348	0.254
56	0.457	0.310	0.284	0.457	0.366	0.276	0.457	0.363	0.269
57	0.473	0.386	0.300	0.473	0.382	0.292	0.473	0.379	0.285
58	0.489	0.402	0.316	0.489	0.398	0.308	0.489	0.395	0.301
59	0.506	0.419	0.333	0.506	0.415	0.325	0.506	0.412	0.318
60	0.523	0.437	0.351	0.523	0.433	0.343	0.523	0.430	0.336
61	0.541	0.455	0.369	0.541	0.451	0.361	0.541	0.448	0.354
62	0.559	0.474	0.385	0.559	0.470	0.380	0.559	0.467	0.373
63	0.578	0.493	0.407	0.578	0.489	0.399	0.578	0.486	0.392
64	0.598	0.512	0.426	0.598	0.508	0.418	0.597	0.505	0.411
65	0.617	0.532	0.446	0.617	0.528	0.438	0.617	0.525	0.431
66	0.638	0.553	0.467	0.638	0.549	0.459	0.638	0.546	0.452
67	0.659	0.574	0.488	0.659	0.570	0.480	0.659	0.567	0.473
68	0.681	0.596	0.410	0.681	0.592	0.502	0.681	0.589	0.495
69	0.703	0.618	0.533	0.703	0.614	0.525	0.703	0.611	0.518
70	0.726	0.641	0.556	0.726	0.637	0.548	0.726	0.634	0.541
71	0.750	0.665	0.580	0.750	0.661	0.572	0.750	0.658	0.565
72	0.775	0.690	0.605	0.775	0.686	0.597	0.775	0.683	0.590
73	0.801	0.716	0.631	0.801	0.712	0.623	0.801	0.709	0.616
74	0.827	0.743	0.658	0.827	0.739	0.650	0.827	0.736	0.643
75	0.854	0.770	0.685	0.854	0.766	0.677	0.854	0.763	0.670
76	0.882	0.798	0.713	0.882	0.794	0.705	0.882	0.791	0.698
77	0.910	0.826	0.741	0.910	0.822	0.733	0.910	0.819	0.726
78	0.939	0.855	0.770	0.939	0.851	0.762	0.939	0.848	0.755
79	0.970	0.886	0.801	0.970	0.882	0.793	0.970	0.879	0.786
80	1.001	0.917	0.833	1.001	0.913	0.825	1.001	0.910	0.818
81	1.033	0.949	0.866	1.033	0.945	0.858	1.033	0.942	0.851
82	1.066	0.982	0.899	1.066	0.978	0.891	1.066	0.975	0.884
83	1.100	1.016	0.933	1.100	1.012	0.925	1.100	1.009	0.918
84	1.135	1.051	0.968	1.135	1.047	0.960	1.135	1.044	0.953
85	1.171	1.087	1.004	1.171	1.083	0.996	1.171	1.080	0.989
86	1.208	1.125	1.042	1.208	1.121	1.034	1.208	1.118	1.027
87	1.246	1.164	1.080	1.246	1.160	1.072	1.246	1.157	1.065
88	1.286	1.203	1.120	1.286	1.199	1.112	1.286	1.196	1.105
89	1.326	1.243	1.161	1.326	1.239	1.153	1.326	1.236	1.146
90	1.367	1.284	1.202	1.367	1.280	1.194	1.367	1.277	1.187

TABLE I. — *Continued.*

t°	26.000			27.000			28.000		
Wet Bulb	0	10	20	0	10	20	0	10	20
50	0.373	0.275	0.177	0.373	0.271	0.169	0.373	0.267	0.162
51	0.386	0.288	0.190	0.386	0.284	0.182	0.386	0.280	0.175
52	0.400	0.302	0.204	0.400	0.298	0.196	0.400	0.294	0.189
53	0.414	0.316	0.218	0.414	0.312	0.210	0.414	0.308	0.203
54	0.428	0.330	0.232	0.428	0.326	0.224	0.428	0.322	0.217
55	0.442	0.344	0.246	0.442	0.340	0.238	0.442	0.336	0.231
56	0.457	0.359	0.261	0.457	0.355	0.253	0.457	0.351	0.246
57	0.473	0.375	0.277	0.473	0.371	0.269	0.473	0.367	0.262
58	0.489	0.391	0.293	0.489	0.387	0.285	0.489	0.383	0.278
59	0.506	0.408	0.310	0.506	0.404	0.302	0.506	0.400	0.295
60	0.523	0.426	0.328	0.523	0.422	0.320	0.523	0.418	0.313
61	0.541	0.444	0.346	0.541	0.440	0.338	0.541	0.436	0.331
62	0.559	0.463	0.365	0.559	0.459	0.357	0.559	0.455	0.350
63	0.578	0.482	0.384	0.578	0.478	0.376	0.578	0.474	0.369
64	0.597	0.501	0.403	0.597	0.497	0.395	0.597	0.493	0.388
65	0.617	0.521	0.423	0.617	0.517	0.415	0.617	0.513	0.408
66	0.638	0.542	0.444	0.638	0.538	0.436	0.638	0.534	0.429
67	0.659	0.563	0.465	0.659	0.559	0.457	0.659	0.555	0.450
68	0.681	0.585	0.487	0.681	0.581	0.479	0.681	0.577	0.472
69	0.703	0.607	0.510	0.703	0.603	0.502	0.703	0.599	0.495
70	0.726	0.630	0.533	0.726	0.626	0.525	0.726	0.622	0.518
71	0.750	0.554	0.557	0.750	0.650	0.549	0.750	0.646	0.542
72	0.775	0.679	0.582	0.775	0.675	0.574	0.775	0.671	0.567
73	0.801	0.705	0.608	0.801	0.701	0.600	0.801	0.697	0.593
74	0.827	0.732	0.635	0.827	0.728	0.627	0.827	0.724	0.620
75	0.854	0.759	0.662	0.854	0.755	0.654	0.854	0.751	0.647
76	0.882	0.787	0.690	0.882	0.783	0.682	0.882	0.779	0.675
77	0.910	0.815	0.718	0.910	0.811	0.710	0.910	0.807	0.703
78	0.939	0.844	0.747	0.939	0.840	0.739	0.939	0.836	0.732
79	0.970	0.875	0.778	0.970	0.871	0.770	0.970	0.867	0.763
80	1.001	0.906	0.810	1.001	0.902	0.802	1.001	0.898	0.795
81	1.033	0.938	0.843	1.033	0.934	0.835	1.033	0.930	0.828
82	1.066	0.971	0.876	1.066	0.967	0.868	1.066	0.963	0.861
83	1.100	1.005	0.910	1.100	1.001	0.902	1.100	0.997	0.895
84	1.135	1.040	0.945	1.135	1.036	0.937	1.135	1.032	0.930
85	1.171	1.076	0.981	1.171	1.072	0.973	1.171	1.068	0.966
86	1.208	1.114	1.019	1.208	1.110	1.011	1.208	1.106	1.004
87	1.246	1.153	1.057	1.246	1.149	1.049	1.246	1.145	1.042
88	1.286	1.192	1.097	1.286	1.188	1.089	1.286	1.184	1.082
89	1.326	1.232	1.138	1.326	1.228	1.130	1.326	1.224	1.123
90	1.367	1.273	1.179	1.367	1.269	1.171	1.367	1.265	1.164

TABLE I. — Continued.

t° Wet Bulb	29.000			30.000			31.000		
	0	10	20	0	10	20	0	10	20
50	0.373	0.264	0.154	0.373	0.260	0.147	0.373	0.256	0.139
51	0.386	0.277	0.167	0.386	0.273	0.160	0.386	0.269	0.152
52	0.400	0.291	0.181	0.400	0.287	0.174	0.400	0.283	0.166
53	0.414	0.305	0.195	0.414	0.301	0.188	0.414	0.297	0.180
54	0.428	0.319	0.209	0.428	0.315	0.202	0.428	0.311	0.194
55	0.442	0.333	0.223	0.442	0.329	0.216	0.442	0.325	0.208
56	0.457	0.348	0.238	0.457	0.344	0.231	0.457	0.340	0.223
57	0.473	0.364	0.254	0.473	0.360	0.247	0.473	0.356	0.239
58	0.489	0.380	0.270	0.489	0.376	0.263	0.489	0.372	0.255
59	0.506	0.397	0.287	0.506	0.393	0.280	0.506	0.389	0.272
60	0.523	0.415	0.305	0.523	0.411	0.298	0.523	0.407	0.290
61	0.541	0.433	0.323	0.541	0.429	0.316	0.541	0.425	0.308
62	0.559	0.452	0.342	0.559	0.448	0.335	0.559	0.444	0.327
63	0.578	0.471	0.361	0.578	0.467	0.354	0.578	0.463	0.346
64	0.597	0.490	0.380	0.597	0.486	0.373	0.597	0.482	0.365
65	0.617	0.510	0.400	0.617	0.506	0.393	0.617	0.502	0.385
66	0.638	0.531	0.421	0.638	0.527	0.414	0.638	0.523	0.406
67	0.659	0.552	0.442	0.659	0.548	0.435	0.659	0.544	0.427
68	0.681	0.574	0.464	0.681	0.570	0.457	0.681	0.566	0.449
69	0.703	0.596	0.487	0.703	0.592	0.480	0.703	0.588	0.472
70	0.726	0.619	0.510	0.726	0.615	0.503	0.726	0.611	0.495
71	0.750	0.543	0.534	0.750	0.539	0.527	0.750	0.535	0.519
72	0.775	0.668	0.559	0.775	0.664	0.552	0.775	0.660	0.544
73	0.801	0.694	0.585	0.801	0.690	0.578	0.801	0.686	0.570
74	0.827	0.721	0.612	0.827	0.717	0.605	0.827	0.713	0.597
75	0.854	0.748	0.639	0.854	0.744	0.632	0.854	0.740	0.624
76	0.882	0.776	0.667	0.882	0.772	0.660	0.882	0.768	0.652
77	0.910	0.804	0.695	0.910	0.800	0.688	0.910	0.796	0.680
78	0.939	0.833	0.724	0.939	0.829	0.717	0.939	0.825	0.709
79	0.970	0.864	0.755	0.970	0.860	0.748	0.970	0.856	0.740
80	1.001	0.895	0.787	1.001	0.891	0.780	1.001	0.887	0.772
81	1.033	0.927	0.820	1.033	0.923	0.813	1.033	0.919	0.805
82	1.066	0.960	0.853	1.066	0.956	0.846	1.066	0.952	0.838
83	1.100	0.994	0.887	1.100	0.990	0.880	1.100	0.986	0.872
84	1.135	1.029	0.922	1.135	1.025	0.915	1.135	1.021	0.907
85	1.171	1.065	0.958	1.171	1.061	0.951	1.171	1.057	0.943
86	1.208	1.103	0.996	1.208	1.099	0.989	1.208	1.095	0.981
87	1.246	1.142	1.034	1.246	1.138	1.027	1.246	1.134	1.019
88	1.286	1.181	1.074	1.286	1.177	1.067	1.286	1.173	1.059
89	1.326	1.221	1.115	1.326	1.217	1.108	1.326	1.213	1.100
90	1.367	1.262	1.156	1.367	1.258	1.149	1.367	1.254	1.141

TABLE II.

Pressure of Moisture under Barometric Pressure 29.700 inches for depression
and Temperature of Wet Bulb.

Temperature of Wet Bulb.	Depression.						
	0°	1°	2°	3°	4°	5°	6°
50	0.373	0.362	0.351	0.339	0.328	0.317	0.305
51	0.386	0.375	0.364	0.352	0.341	0.330	0.308
52	0.400	0.389	0.377	0.366	0.355	0.344	0.332
53	0.414	0.403	0.391	0.380	0.369	0.358	0.346
54	0.428	0.417	0.405	0.394	0.383	0.372	0.360
55	0.442	0.431	0.419	0.408	0.397	0.386	0.374
56	0.457	0.446	0.434	0.423	0.412	0.401	0.369
57	0.473	0.462	0.440	0.439	0.428	0.417	0.405
58	0.489	0.478	0.466	0.455	0.444	0.433	0.421
59	0.506	0.495	0.483	0.472	0.461	0.450	0.438
60	0.523	0.512	0.501	0.490	0.479	0.468	0.456
61	0.541	0.530	0.519	0.508	0.497	0.486	0.474
62	0.559	0.548	0.537	0.526	0.515	0.504	0.493
63	0.578	0.567	0.556	0.545	0.534	0.523	0.512
64	0.597	0.586	0.575	0.564	0.553	0.542	0.531
65	0.617	0.606	0.595	0.584	0.573	0.562	0.552
66	0.638	0.627	0.616	0.605	0.594	0.583	0.572
67	0.659	0.648	0.637	0.626	0.615	0.604	0.593
68	0.681	0.670	0.659	0.648	0.637	0.626	0.615
69	0.703	0.692	0.681	0.670	0.659	0.648	0.637
70	0.726	0.715	0.704	0.693	0.682	0.671	0.660
71	0.750	0.739	0.728	0.717	0.706	0.695	0.684
72	0.775	0.764	0.753	0.742	0.731	0.720	0.709
73	0.801	0.790	0.779	0.768	0.757	0.746	0.735
74	0.827	0.816	0.805	0.794	0.783	0.772	0.761
75	0.854	0.843	0.832	0.821	0.810	0.799	0.788
76	0.882	0.871	0.860	0.849	0.838	0.827	0.816
77	0.910	0.899	0.888	0.877	0.866	0.855	0.844
78	0.939	0.928	0.917	0.906	0.895	0.884	0.872
79	0.970	0.959	0.948	0.937	0.926	0.915	0.904
80	1.001	0.990	0.979	0.968	0.957	0.946	0.935
81	1.033	1.022	1.011	1.000	0.989	0.978	0.967
82	1.066	1.055	1.044	1.033	1.022	1.011	1.000
83	1.100	1.089	1.078	1.067	1.056	1.045	1.034
84	1.135	1.125	1.114	1.103	1.092	1.081	1.069
85	1.171	1.160	1.149	1.138	1.127	1.116	1.106
86	1.208	1.197	1.186	1.175	1.164	1.153	1.143
87	1.246	1.235	1.224	1.214	1.203	1.192	1.182
88	1.286	1.276	1.265	1.254	1.243	1.232	1.221
89	1.326	1.316	1.305	1.294	1.283	1.272	1.261
90	1.367	1.357	1.346	1.335	1.324	1.313	1.303

TABLE II.—Continued.

Temperature of Wet Bulb.	Depression.						
	7°	8°	9°	10°	11°	12°	13°
50	0.294	0.283	0.272	0.261	0.250	0.239	0.228
51	0.307	0.296	0.285	0.274	0.263	0.252	0.241
52	0.321	0.310	0.299	0.288	0.277	0.266	0.255
53	0.335	0.324	0.313	0.302	0.291	0.280	0.269
54	0.349	0.338	0.327	0.316	0.305	0.294	0.283
55	0.363	0.352	0.341	0.330	0.319	0.308	0.297
56	0.378	0.367	0.356	0.345	0.334	0.323	0.312
57	0.394	0.383	0.372	0.361	0.350	0.339	0.328
58	0.410	0.399	0.388	0.377	0.366	0.355	0.344
59	0.427	0.416	0.405	0.394	0.383	0.372	0.361
60	0.445	0.434	0.423	0.412	0.401	0.390	0.379
61	0.463	0.452	0.441	0.430	0.419	0.408	0.397
62	0.482	0.471	0.460	0.449	0.438	0.427	0.416
63	0.501	0.490	0.479	0.468	0.457	0.446	0.435
64	0.520	0.509	0.498	0.487	0.476	0.465	0.454
65	0.540	0.529	0.518	0.507	0.496	0.485	0.474
66	0.561	0.550	0.539	0.528	0.517	0.506	0.495
67	0.582	0.571	0.560	0.549	0.538	0.527	0.516
68	0.604	0.593	0.582	0.571	0.560	0.549	0.538
69	0.626	0.615	0.604	0.593	0.582	0.571	0.560
70	0.649	0.638	0.627	0.616	0.604	0.593	0.582
71	0.673	0.662	0.651	0.640	0.628	0.617	0.606
72	0.698	0.687	0.676	0.665	0.654	0.643	0.632
73	0.724	0.713	0.702	0.690	0.679	0.668	0.657
74	0.750	0.739	0.728	0.718	0.706	0.695	0.684
75	0.777	0.766	0.755	0.744	0.733	0.722	0.711
76	0.805	0.794	0.783	0.772	0.761	0.750	0.739
77	0.833	0.822	0.811	0.800	0.789	0.778	0.767
78	0.862	0.851	0.840	0.829	0.818	0.807	0.796
79	0.893	0.882	0.871	0.860	0.849	0.838	0.827
80	0.924	0.913	0.902	0.892	0.881	0.870	0.859
81	0.956	0.945	0.934	0.924	0.913	0.902	0.891
82	0.989	0.978	0.967	0.957	0.946	0.935	0.924
83	1.023	1.012	1.001	0.991	0.980	0.969	0.958
84	1.058	1.047	1.036	1.026	1.015	1.004	0.993
85	1.094	1.083	1.072	1.062	1.051	1.040	1.029
86	1.132	1.121	1.110	1.100	1.089	1.078	1.067
87	1.171	1.160	1.149	1.139	1.128	1.117	1.106
88	1.210	1.199	1.188	1.178	1.167	1.156	1.145
89	1.250	1.239	1.228	1.218	1.207	1.196	1.185
90	1.292	1.281	1.270	1.259	1.249	1.238	1.227

TABLE II.—Continued.

Tempera- ture of Wet Bulb.	Depression.						
	14°	15°	16°	17°	18°	19°	20°
50	0.217	0.205	0.194	0.183	0.171	0.160	0.149
51	0.230	0.218	0.207	0.196	0.184	0.173	0.162
52	0.244	0.232	0.221	0.210	0.198	0.187	0.176
53	0.258	0.246	0.235	0.224	0.212	0.201	0.190
54	0.272	0.260	0.249	0.238	0.226	0.215	0.204
55	0.286	0.274	0.263	0.252	0.240	0.229	0.218
56	0.301	0.289	0.278	0.267	0.255	0.244	0.233
57	0.317	0.305	0.294	0.283	0.271	0.260	0.249
58	0.333	0.321	0.310	0.299	0.287	0.276	0.265
59	0.350	0.338	0.327	0.316	0.304	0.293	0.282
60	0.368	0.356	0.345	0.334	0.322	0.311	0.300
61	0.386	0.374	0.363	0.352	0.340	0.329	0.318
62	0.405	0.393	0.382	0.371	0.359	0.348	0.337
63	0.424	0.412	0.401	0.390	0.378	0.367	0.356
64	0.443	0.431	0.420	0.409	0.397	0.386	0.375
65	0.463	0.451	0.440	0.429	0.417	0.406	0.395
66	0.484	0.472	0.461	0.450	0.438	0.427	0.416
67	0.505	0.493	0.482	0.471	0.459	0.448	0.437
68	0.527	0.515	0.504	0.493	0.481	0.470	0.459
69	0.549	0.537	0.526	0.515	0.504	0.493	0.482
70	0.571	0.560	0.549	0.538	0.527	0.516	0.505
71	0.595	0.584	0.573	0.562	0.551	0.540	0.529
72	0.621	0.609	0.598	0.587	0.576	0.565	0.554
73	0.646	0.635	0.624	0.613	0.602	0.591	0.580
74	0.673	0.662	0.651	0.640	0.629	0.618	0.607
75	0.700	0.689	0.678	0.667	0.656	0.645	0.634
76	0.728	0.717	0.706	0.695	0.684	0.673	0.662
77	0.756	0.745	0.734	0.723	0.712	0.701	0.690
78	0.785	0.774	0.763	0.752	0.741	0.730	0.719
79	0.816	0.805	0.794	0.783	0.772	0.761	0.750
80	0.848	0.837	0.826	0.815	0.804	0.793	0.782
81	0.880	0.869	0.859	0.848	0.837	0.826	0.815
82	0.913	0.902	0.892	0.881	0.870	0.859	0.848
83	0.947	0.936	0.926	0.915	0.904	0.893	0.882
84	0.982	0.971	0.961	0.950	0.939	0.928	0.917
85	1.018	1.007	0.997	0.986	0.975	0.964	0.953
86	1.056	1.045	1.035	1.024	1.013	1.002	0.991
87	1.095	1.084	1.074	1.063	1.052	1.041	1.030
88	1.134	1.123	1.113	1.102	1.091	1.080	1.069
89	1.175	1.164	1.153	1.142	1.132	1.121	1.110
90	1.216	1.205	1.195	1.184	1.173	1.162	1.151

TABLE III.

Humidity of the air for Barometric pressure 29.70 arguments Temperature and Depression Wet Bulb.

Temperature of Wet Bulb.	Depression.						
	0°	1°	2°	3°	4°	5°	6°
50	1.000	0.970	0.940	0.910	0.880	0.850	0.820
51	1.000	0.971	0.942	0.913	0.884	0.855	0.826
52	1.000	0.972	0.944	0.916	0.888	0.860	0.832
53	1.000	0.973	0.946	0.919	0.892	0.865	0.838
54	1.000	0.974	0.948	0.922	0.896	0.870	0.844
55	1.000	0.975	0.950	0.925	0.899	0.873	0.848
56	1.000	0.976	0.951	0.927	0.902	0.877	0.852
57	1.000	0.977	0.953	0.929	0.905	0.881	0.857
58	1.000	0.977	0.954	0.931	0.908	0.885	0.862
59	1.000	0.978	0.956	0.934	0.911	0.889	0.867
60	1.000	0.979	0.957	0.936	0.914	0.893	0.871
61	1.000	0.980	0.959	0.939	0.917	0.897	0.876
62	1.000	0.981	0.961	0.941	0.921	0.901	0.881
63	1.000	0.981	0.962	0.943	0.924	0.905	0.885
64	1.000	0.982	0.964	0.945	0.927	0.908	0.889
65	1.000	0.982	0.965	0.947	0.930	0.911	0.893
66	1.000	0.983	0.966	0.949	0.932	0.914	0.897
67	1.000	0.983	0.967	0.951	0.934	0.917	0.900
68	1.000	0.984	0.968	0.952	0.936	0.920	0.903
69	1.000	0.984	0.969	0.954	0.938	0.922	0.905
70	1.000	0.985	0.970	0.956	0.940	0.924	0.908
71	1.000	0.985	0.971	0.957	0.942	0.927	0.911
72	1.005	0.986	0.972	0.958	0.944	0.929	0.914
73	1.000	0.986	0.973	0.959	0.946	0.931	0.917
74	1.000	0.987	0.974	0.960	0.947	0.933	0.919
75	1.000	0.987	0.974	0.961	0.948	0.935	0.921
76	1.000	0.987	0.975	0.963	0.950	0.937	0.924
77	1.000	0.988	0.976	0.964	0.952	0.939	0.927
78	1.000	0.988	0.977	0.965	0.954	0.941	0.929
79	1.000	0.988	0.978	0.966	0.955	0.943	0.931
80	1.000	0.989	0.978	0.967	0.956	0.945	0.934
81	1.000	0.989	0.979	0.968	0.958	0.947	0.936
82	1.000	0.989	0.980	0.969	0.959	0.949	0.939
83	1.000	0.990	0.980	0.970	0.960	0.950	0.941
84	1.000	0.990	0.981	0.971	0.962	0.952	0.942
85	1.000	0.990	0.981	0.972	0.963	0.953	0.944
86	1.000	0.991	0.982	0.973	0.964	0.955	0.946
87	1.000	0.991	0.983	0.974	0.965	0.956	0.947
88	1.000	0.991	0.983	0.975	0.966	0.958	0.949
89	1.000	0.991	0.984	0.976	0.967	0.959	0.951
90	1.000	0.992	0.984	0.976	0.968	0.960	0.952

TABLE III.—Continued.

Temperature of Wet Bulb.	Depression.						
	7°	8°	9°	10°	11°	12°	13°
50	0.790	0.760	0.730	0.700	0.670	0.640	0.610
51	0.797	0.768	0.739	0.710	0.681	0.652	0.623
52	0.804	0.776	0.748	0.720	0.692	0.664	0.636
53	0.811	0.784	0.757	0.729	0.702	0.675	0.648
54	0.817	0.791	0.765	0.738	0.712	0.686	0.660
55	0.823	0.798	0.772	0.746	0.721	0.696	0.671
56	0.828	0.804	0.779	0.755	0.730	0.705	0.680
57	0.832	0.810	0.787	0.763	0.739	0.715	0.691
58	0.838	0.817	0.794	0.771	0.748	0.725	0.702
59	0.844	0.823	0.801	0.778	0.756	0.734	0.712
60	0.850	0.829	0.808	0.786	0.764	0.742	0.721
61	0.855	0.835	0.815	0.794	0.772	0.751	0.731
62	0.861	0.841	0.821	0.801	0.780	0.760	0.741
63	0.866	0.847	0.828	0.809	0.789	0.769	0.750
64	0.870	0.852	0.834	0.816	0.797	0.778	0.759
65	0.874	0.857	0.839	0.822	0.804	0.786	0.767
66	0.879	0.862	0.844	0.827	0.810	0.793	0.775
67	0.883	0.866	0.849	0.833	0.816	0.799	0.782
68	0.886	0.870	0.854	0.838	0.822	0.805	0.789
69	0.889	0.874	0.859	0.843	0.827	0.811	0.796
70	0.892	0.877	0.863	0.848	0.833	0.817	0.802
71	0.896	0.881	0.867	0.853	0.838	0.823	0.809
72	0.899	0.885	0.872	0.858	0.844	0.829	0.815
73	0.903	0.889	0.876	0.863	0.849	0.835	0.821
74	0.906	0.892	0.880	0.867	0.854	0.840	0.827
75	0.909	0.896	0.884	0.871	0.858	0.845	0.832
76	0.912	0.900	0.888	0.875	0.863	0.850	0.837
77	0.915	0.903	0.891	0.879	0.867	0.854	0.842
78	0.917	0.906	0.895	0.883	0.872	0.859	0.847
79	0.919	0.909	0.898	0.887	0.876	0.864	0.853
80	0.922	0.912	0.902	0.891	0.880	0.869	0.858
81	0.925	0.915	0.905	0.895	0.884	0.873	0.863
82	0.929	0.918	0.908	0.898	0.888	0.877	0.867
83	0.931	0.921	0.911	0.901	0.891	0.881	0.871
84	0.932	0.924	0.914	0.904	0.895	0.885	0.875
85	0.935	0.926	0.917	0.907	0.898	0.889	0.879
86	0.937	0.938	0.919	0.910	0.901	0.892	0.883
87	0.939	0.920	0.922	0.913	0.905	0.897	0.888
88	0.941	0.932	0.924	0.916	0.908	0.900	0.892
89	0.943	0.935	0.927	0.919	0.910	0.902	0.894
90	0.944	0.936	0.928	0.921	0.914	0.906	0.898

TABLE III.—Continued.

Temperature of Wet Bulb.	Depression.						
	14°	15°	16°	17°	18°	19°	20°
50	0.580	0.550	0.520	0.490	0.460	0.430	0.400
51	0.594	0.565	0.536	0.507	0.478	0.449	0.420
52	0.608	0.580	0.552	0.524	0.496	0.468	0.440
53	0.620	0.594	0.567	0.540	0.513	0.486	0.459
54	0.632	0.607	0.582	0.556	0.530	0.504	0.477
55	0.644	0.620	0.595	0.570	0.545	0.519	0.493
56	0.656	0.632	0.608	0.584	0.560	0.535	0.510
57	0.668	0.644	0.621	0.597	0.574	0.550	0.526
58	0.679	0.656	0.634	0.611	0.588	0.565	0.542
59	0.690	0.668	0.646	0.624	0.602	0.580	0.557
60	0.700	0.680	0.659	0.637	0.616	0.595	0.573
61	0.711	0.691	0.671	0.650	0.630	0.609	0.588
62	0.721	0.702	0.683	0.663	0.643	0.623	0.602
63	0.731	0.712	0.693	0.674	0.655	0.636	0.616
64	0.740	0.721	0.703	0.684	0.666	0.647	0.628
65	0.749	0.730	0.712	0.694	0.676	0.658	0.640
66	0.757	0.739	0.722	0.704	0.687	0.669	0.652
67	0.765	0.748	0.731	0.714	0.697	0.680	0.663
68	0.773	0.756	0.740	0.723	0.707	0.690	0.674
69	0.780	0.764	0.749	0.733	0.717	0.701	0.685
70	0.787	0.772	0.757	0.742	0.727	0.711	0.696
71	0.794	0.779	0.765	0.751	0.736	0.721	0.706
72	0.801	0.786	0.772	0.758	0.744	0.730	0.715
73	0.807	0.793	0.780	0.766	0.752	0.738	0.725
74	0.813	0.800	0.787	0.774	0.761	0.747	0.734
75	0.819	0.806	0.794	0.781	0.768	0.755	0.742
76	0.825	0.812	0.800	0.788	0.775	0.763	0.750
77	0.830	0.818	0.806	0.794	0.782	0.770	0.758
78	0.836	0.824	0.812	0.800	0.789	0.777	0.766
79	0.842	0.830	0.818	0.807	0.796	0.784	0.774
80	0.847	0.836	0.825	0.814	0.803	0.792	0.782
81	0.852	0.841	0.831	0.820	0.809	0.799	0.789
82	0.857	0.846	0.836	0.826	0.815	0.805	0.795
83	0.861	0.851	0.842	0.832	0.822	0.812	0.802
84	0.866	0.856	0.847	0.838	0.828	0.818	0.808
85	0.870	0.861	0.852	0.843	0.833	0.824	0.814
86	0.874	0.865	0.856	0.847	0.838	0.829	0.820
87	0.879	0.870	0.861	0.852	0.843	0.835	0.826
88	0.883	0.874	0.865	0.857	0.849	0.841	0.832
89	0.886	0.878	0.870	0.862	0.853	0.845	0.837
99	0.890	0.882	0.874	0.866	0.858	0.850	0.842

ART. VIII.—*Literary and Scientific Notices.*1. *Magnificent Sculptures found on opening the Mound of Nimrod, near Nineveh.*

Letters from Baghdad mention that Mr. Layard, a gentleman sent down by Sir Stratford Canning, has cut into the great *Mound of Nimrod*, on this side Nineveh, and discovered most magnificent sculptures, statues, and inscriptions in the cuneiform character of the most remote Babylonian era. He has also found copper swords, and the copper-tools with which the works were executed. The Mound is close to the Tigris, and transport will consequently be easy. In the mean time petty jealousy, on the part of the Pasha of Mosul, backed by the intrigues of good natured Gallic friends, has put a stop to the work of excavation, till a *Firman* has been obtained from the Porte.

2. *Maratha and Kanarese languages.*

These two languages are used by the natives inhabiting the countries from the upper part of the Nermada, (Nerbudda), on the North, to the source of the Kavary river, on the South; or from the 11th to the 21st degrees of north latitude; being bounded west-ward by the ocean, and east-ward by a line drawn from the upper parts of the Nerbudda, through Nagpoor, and the sources of the Warda river in this province, to Nandere, Beder, Maktal, Raichore, Gooty, Pennakonda, Panganoor, Venkatagerry, and sources of the Kavary. The region to which the Maratha language is particularly confined, is bounded, on the west and south, by a line drawn from Sedasheoghar, on the Malabar coast, to Koorundwar, Hassoor, Bahmenhaal, Jeroor, Jeergeeyal, Jutt, Mangalweera and sources of the Maun river, through Sholapoor, and thence, east-ward to Beder: at which place and its neighbourhood, the Telagu, Maratha, and Kanarese dialects seem to unite. The boundary of the Kanarese language on the W. and N. is the line now described from Sedasheoghar, and marks the extent of the Karnataka province on this side, as distinguished from that of Maharashtra, both of which however were anciently included in one kingdom; and of which Kalian, near Beder, was the capital, the country at this time being known by the name of the southern *Kuntala Desha*. It is so named in an inscription of the twelfth century of our era A. D. 1173, (As: Res. ix. page 431). The Shapti Sambheda, quoted by Ward, on the Geography of the Hindus, describes Maharashtra, or Karnata, as extending from Ujain and the

holy place Marjara to Kolapoor, thus excluding Karnata proper ; but the fact of this region being indiscriminately named, by a Sanskrit writer, Maharashtra or Karnata, shows that both were at some period included in one kingdom as just mentioned ; and facts are not wanting to prove an interesting circumstance in the history of the country that both were the scenes of Bauddha missionary labours, during the reign of the great Emperor Asoka, or B. C. 247.

3. *Duplicate of the Rosetta Stone Inscription found at Philæ.*

The learned Prussian, Monsieur Lepsius, in a letter to M. Letronne, communicated to the Academy of Inscriptions and *Belles-Lettres* of Paris, states that he has discovered a duplicate of the Rosetta-Inscription at Philæ, along with many other inscriptions collected in Egypt and Ethiopia.—The following is an extract from his journal—"At Philæ I have discovered a copy of the decree of the Rosetta-Inscription : the hieroglyphic part of which has been already observed by Salt, as I have since learned ; the *demotic text*, however, as far as I know, has not been mentioned by any one. Champollion takes no notice of it in his letters, and paid no attention to it as would appear, though it be an inscription of very great importance, since it repeats the decree word for word, and even preserves the same number of lines, so that the end of the decree, relative to the *triple system of writing*, is here found ; although the Greek text has not been added, unless it may have been put below in letters of red, which are now effaced. A considerable part of the lower corner, wanting in the Rosetta-Stone, may be restored from our inscription, which will be of great utility to Egyptian philology ; and the *demotic part* is also well preserved throughout, unless where the letters are taken away by the hieroglyphics, which Ptolemy Dionysos* placed above.† Along side of this decree there is another, also bi-lingual, and

* This is king Ptolemy XII, who reigned along with his sister the celebrated Cleopatra, between the years 52 to 48, before the Christian era. It is an error of the Chronologists calling him *Dionysos*.

† This fact of hieroglyphics cut, in the time of Ptolemy XII, above a demotic inscription of the time of *Epiphanes*, is most curious and hitherto unique : but it will not surprise those who know the Egyptian *low reliefs*, sculptured above the Greek inscriptions, of the time of Ptolemy Dionysos, on the great *pylon* of Philæ.

with the same termination* relative to the three systems of writing, but with the indication of some other place where this decree ought to find its place in the temples. I have found in this for the first time, the name of the City of Alexandria; and will copy the inscriptions after the impressions which I have taken; subsequent to which I shall be able to say more.

You are perhaps apprized that I have found, at the base of the obelisk, which Mr. Banks left at Philæ, the traces of a fourth Greek inscription,† in large painted letters of five or six lines at least. Unfortunately I can only affirm the existence of such an inscription; but it will be impossible to decipher it, as I convinced myself anew during our late stay at Philæ.

On the subject of Ethiopic Inscriptions M. Lepsius continues;—“In short I have collected a very great number of *demotic inscriptions*, and what is of more importance several *Ethiopic inscriptions*. I believe I am authorized in calling them so, after my conviction that they contain the language of the inhabitants of Meroe at the period of its greatness. I have found these inscriptions in the Pyramids of Meroe, relative even to the representations of their Chambers: they are found frequently along side of *hieroglyphic* inscriptions, sufficiently rude. The people of the ancient *Meroe*, (whose monuments are certainly among the most modern of the antiquities found in the upper valley of the Nile,) descended even to the frontiers of Egypt: and I have discovered an *Ethiopian temple*, erected by the same kings and queens who built the temples of *Naga* and the pyramids of *Meroe*, in the country of the Cataracts, at *Amara*, and some specimens of their inscriptions even at Philæ. I believe also, I can prove, and have given the general reasons

* This refers to the last phrase of the Rosetta Inscription, wherein is mentioned that the decree should be engraved in *three characters sacred, common, and Greek*.

† I had no knowledge of this fact, but it is nothing more than very natural. There are three Inscriptions on the base of the Obelisk. 1st The petition of the priests of Philæ; 2nd The royal rescript which granted their request; 3d. The letter of advice in the proclamation. There is then wanting the reply of the priests, both to the king and to the proclamation, containing the expression of their gratitude. This is without doubt the subject of the fourth Inscription found at the base of the Obelisk, which is unfortunately in an irrecoverable state.

for this opinion in a memoir sent to the Academy of Sciences at Berlin, that the Ethiopic language of the ancient *Meroe* exists yet, and is that spoken by the widely spread population of Bichariba, (Bisharin,) which occupies all the countries on the east, from the 23° to the 13° of N. L. as well as the fertile provinces of *Taka* which had latterly revolted from the Turks, during the time we were above. I have studied as much as I could, during the ten months I have spent in Ethiopia, the principal languages of the country; chiefly *Nubian*, in the valley of the Nile, from Assuan to the frontier of *Dongola*; the *Kongara* of the people of *Darfour*; and the *Beja* of the Bichariba. I have discovered that this latter language is a most interesting branch of the *Caucasian* family, though it be very different from the Egyptian language. I am perfectly convinced that the Ethiopians, in the time of the Ancient Pharaohs, had nothing almost in common, as a people, with the Egyptians, and that the ancient traditions relative to high Ethiopian civilization, are explained now in a way very different, but quite satisfactorily, by the important part which Egyptian civilization played in Ethiopia 2000 B. C. *L. Institut Nos. 109. sect:11.*

4. *M. Schmidt's Tibetan Grammar and Dictionary.*

At length M. Schmidt has finished the publication, at St. Petersburg, of his Dictionary of the Tibetan language, and the edition of the Tibetan text of the *Dganglingun*, with the corresponding German translation. These two works form, along with the Tibetan Grammar published in 1841, all that is necessary for the study of this language. Thus, by six works which have followed each other at short intervals, has this laborious Academician first opened, for the investigation of the learned, two literary languages of Central Asia, which before him, were deemed almost inaccessible. *L. Institut Nos. 111. Sec 11. March 1845.*

5. *M. Botta's discoveries at Nineveh. — Continued.*

In anticipation of the report from the Academy of Inscriptions, which will be given in our next number, &c. we here present an extract from two letters, on the discoveries of M. Botta at Nineveh, translated from a foreign collection wherein we have found them.

“ There has been again published an account of 15 chambers, some of which are above 400 feet long, being evidently part of a magnificent

palace. Their walls are entirely covered with inscriptions and sculptures. These last are almost without exception historical and illustrative of events of the highest interest, such as sieges, naval operations, triumphs, particular combats, &c. The inscriptions are in cuneiform characters, and of such an extent that if all those of the same kind, previously known, were joined end ways, they would not equal the space which the new inscriptions occupy. The character employed exactly resembles that of the inscribed columns at Persepolis, Hamadan (Ecbatana), &c. and the primitive inscriptions at Van. Each door has two rows of sculptures, placed one above the other; and the inscriptions, containing generally about 20 lines, are engraved between. We meet with them however frequently upon the vestments of figures, upon the towers, and other objects, which one observes in the *bas-reliefs*. We cannot doubt that they are dedicated to the events represented by these figures, and the names of the principal actors which they present, carry the conviction that they contain a portion of the historical archives of the kingdom. Independently of the variety of the subjects described by the sculpture, the spirit and the beauty of their execution offer the widest field for admiration and for conjecture. For those who have been in the habit of regarding the Greeks as the veritable masters in imitative arts, the sculptures of Nineveh furnish a new subject for research and for reflection. Though we cannot assign to these remains an origin much anterior to the most ancient periods of art amongst the Greeks, they appear to me quite original, both in design and execution. Though probably cotemporary with several of the most ancient sculptures in Egypt, they are incomparably superior to the stiff and ill proportioned figures of the monuments of the Pharaohs. This shows some knowledge of anatomy and human physiognomy, a remarkable intelligence of character, and surprising harmony in the *contour* and general execution.

At this period, the rude style had already given place to civilized art. The ornaments, dresses, implements of war, are finished with precision and extraordinary minuteness, without departing from a harmonious whole. The extreme beauty and elegance of the various objects, introduced amongst the groups, must command admiration.—The form of the vases, the drinking cups, the sword handles ornamented with lions, the shields decorated with animals and flowers, the arm chairs, the

tables and other utensils for domestic use, the ornaments for the head, the bracelets and earrings, are all finished with consummate taste, and rival the productions of the most flourishing periods of art amongst the Greeks. In spite of this, there are some faults in the general execution, such as frequent errors in the relative proportions of the figures ; we see also evidently that the same hand has not presided over the entire work.

The nature of the sculptures and also of the inscriptions are alone sufficient to prove that they existed at a period prior to the conquest of Persia by the Macedonians; the difficulty is to know to which of the three great dynasties, which successively ruled the empire of the Assyrians, they ought to be ascribed, viz : the *first race* of Kings, of which Sardana-palus was the last B. C. 820 ; the *second race*, which became extinct at the destruction of Nineveh by Cyaxares (608) ; or the *Medo-Persian* conquerors, who governed the east till the time of their defeat by Alexander. The first supposition may be abandoned as quite improbable.—Several important facts concur to make us believe that the second Assyrian era was the date of the construction of the edifice : the first of these is a very remarkable passage in the xxiii Chapter of Ezekiel, 14 and 15 verses : “ she saw men pourtrayed upon the wall, the images of the Chaldeans pourtrayed with vermillion, girded with girdles upon their loins, exceeding in dyed attire upon their heads, all of them princes to look to, after the manner of the Babylonians of Chaldea, the land of their nativity.” It is impossible for any one having a knowledge of M. Botta’s sculptures not to be struck by the exact description of them which this passage contains. It is evident that the entire surface of the marble has been painted with a sort of red ochre, except in certain places where the ornaments have been re-painted with more brilliant colours. The richly decorated girdles and head ornaments of the principal personages, whether these ornaments be tiaras, mitres, or simple bands, binding the hair round the temples and floating behind the back, are of a remarkable form. The agreement of these figures with the text in Ezekiel is such that we are forced to conclude that the prophet had these or similar sculptures in view. It must be remembered that Ezekiel prophesied by the river *Chebar*, the Chaboras or Khabour, in the immediate neighbourhood of Nineveh, and that, as we gather from this chapter, at a period previous to the fall of this city.

The following facts prove yet more that the monument of right belongs to the second Assyrian dynasty, viz; the absence of sacred symbols and emblems belonging to the *Magian religion*, the nature of the divinities and idols represented, the historical evidence which assigns it to the period of the destruction of Nineveh, the vestments of the figures, the character employed in the inscriptions, and the style of Architecture.

Between the fall of the first Assyrian dynasty and the final ruin of Nineveh, by the united armies of Cyaxares and Nebuchadnezzar, the Assyrian empire was governed by a race of Kings who extended their conquest over the whole of Western Asia, and even as far as the frontiers of Africa. Under the reigns of Senharib or Sennacherib, and Esarhaddon, the Assyrian empire comprehended not only the countries, which circumscribed the frontiers of Assyria, in the widest sense of the term, namely, Babylonia, Susa, and part of Media and Mesopotamia, but likewise Cilicia, Phœnicia, Syria, Egypt, Ethiopia, and part of Arabia. The monarchs of this dynasty are frequently mentioned in history and the Jewish prophecies. Their names, indicating from their construction an Indo-Germanic origin, entirely differ from those of the Kings belonging to the first Assyrian dynasty, which have been preserved by the profane historians, and are evidently of Semitic origin. This fact would tend to prove that this second dynasty came from Media. But as the Magian religion appears, even at this time, to have prevailed in this country, it would be reasonable to conclude that if the new dynasty was one of conquerors, these conquerors would have imposed their religion on Assyria. The same remark is applicable respecting the Median language, but we have proofs most satisfactory that the Assyrians retained their language along with the ancient characters of their works. Thus in Kings, ch. xix v : 36 and 37, it is said that Sennacherib was slain by his sons at the time he was worshipping in the temple (or house) of *Nisroch*, his god, (Isaiah ch : xxxvii v : 38) ; also in Kings ch : xviii we read that the commanders of the same monarch were required to speak in Syriac and not in Hebrew. The Magi worshipped not in temples, and moreover, the name of the Assyrian divinity is an unexceptionable proof of its Semitic origin. *Nisr*, in all the Aramæan (Syrian) dialects, signifies an eagle ; and Gesenius was of opinion that *Nisroch* signifies the great eagle. Now the divinity which is most frequently represented in the sculptures discovered by M. Botta, joins to the

human form the head and wings of an eagle. The presence of this figure at Nineveh, coming to support the text of the book of Kings, can scarcely be considered as a merely accidental coincidence. As one has found but one Semitic divinity, it may nevertheless be conjectured that there exist other emblems of the same worship. We have accordingly *Baal* or the Assyrian Hercules.—The figure seems to represent this divinity. The characteristic feature of all the religious systems of Western Asia consists of gigantic proportions and imposing forms. In one of his hands he is strangling with apparent ease a lion, whose contorted features, and extended claws grasping the garments of the god, attest the superhuman force which presides at his destruction. In the other hand is a serpent with a monstrous head, or armour of this form. These two attributes denote at once the Hercules of the Semitic race, whence the Greeks derived the traditions which they ultimately applied to their own proper Hero. In the low relief representing the manoeuvres of a fleet at sea, one notices a marine divinity, whose superior half represents a man, and inferior extremity the tail of a fish, probably a *triton*, of which the worship extended widely in the east. These divinities, so completely opposed to the spirit of the Magian religion, prove then that the doctrines of *Zoroaster* had not yet been introduced among the Assyrian people.

The dress of the Kings altogether resembles that of the Medes. A mitre, or conical raised cap, painted with gaudy colours, covers their head. Their hair and beards are so carefully curled, and so minutely and neatly arranged, that they look more artificial than natural. Some of the long robes, richly decorated with borders and fringes, descend to the ancle. Other persons are dressed like, and represent apparently the courtiers having authority inferior to that of the Monarch. The warriors wear helmets and are clad in armour. Though this royal costume may be Median, it must not be forgotten that it also resembles very nearly that of the Babylonians. These allow their hair to grow, says Herodotus, when he describes this people, and have a mitre on their heads. They carry in their hands a *baton*, on the head of which is carved an apple, a rose, a lily, an eagle, or some other figure. They generally wear a linen tunick, which descends to the ancle, above which is another of the same material; and over the whole is thrown a small white cloak. But the Babylonians might have adopted before the time

of Herodotus the costume of their conquerors the Medo-Persians. Thus, though the similarity of the dresses found in the sculptures of Nineveh and Persepolis, would lead to the conjecture that both kind of monuments ascend to a Median origin, this opinion is not altogether of absolute certainty. The exact description of Ezekiel, contained in the passage which we have quoted, would appear to force on us the admission of a South-Assyrian origin. *L. Institut No. 112 April 1845.*

ART. IX.—*Extracts from the Proceedings of the Society.*

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held, in the Library Rooms, on Thursday, the 9th January 1845.

The minutes of last meeting were read and approved of.

Assistant Surgeon J. Peet, proposed at last meeting, was ballotted for and duly elected; and Dunjeebhoy Framjee Esq., proposed as a subscriber to the Library by Dr. Buist, and seconded by the Secretary, was admitted agreeably to the regulations.

The Marquis de Ferriere LeVayer, Secretary to the French Embassy in China, proposed as an Honorary Member by Colonel Jervis, Vice President, seconded by Dr. Burnes. К. Н. Vice President, and the Secretary, was duly elected, in accordance with Art. IX of the Regulations.

Dr. D. Grierson, of the Bombay Medical service, proposed as a Member of the Society by Dr. Burnes, К. Н. seconded by the Secretary, to be ballotted for at next meeting.

The proposition for reducing a portion of the sum now expended on account of newspapers, of which due notice was given, having been submitted to the meeting, R. W. Crawford Esq., seconded by Dr. Buist, proposed that the finance committee, in reporting on the best means of reducing the current expenses of the Society, be requested to name the sum which ought, in their opinion, to be reduced from the usual charges for newspapers and periodicals; and that this sum having been fixed on, all periodicals and newspapers be held discontinued, so as to admit of Members of the Society naming those to be in future taken, within the limits of the prescribed sum. Notice of this to be given before next meeting.

The proposition also, of which previous notice was given, to partly

relieve the Society, in the present state of its finances, from the expenses of publishing the quarterly journal, by charging Members of the Society Rs. 2, for each number, and subscribers, not Members, at the rate of Rs. 2½, having been brought before the meeting, it was thereon resolved that a subscription list be circulated to all Members of the Society, requesting their support of, and subscription to, the quarterly journal which promises to be of general interest in the *History, Philology, Palæography, Mythology, and Antiquities* of Western India, and the neighbouring countries; but which, without such support, must otherwise be discontinued: a subscription was accordingly opened, to which the Members at the Meeting appended their names.

The following donations were laid on the table :

To the Library.

Copy of Mr. Frere's translation of the Frogs of Aristophanes, and of Theognis, accompanied by a note from his nephew W. E. Frere Esq., of the Bombay Civil Service.

Second.—2 sets of Chinese Books, by J. Turner Esq., Assistant Surgeon, presented through the Vice President, Dr. Burnes, к. н.

To the Museum.

Various specimens of petrified wood, from the petrified forest near Cairo, by Wm. Pigou, Esq. Assistant Surgeon, through Dr. Burnes.—A shark's jaw, and specimens of black coral, by Captain J. A. Young, through Professor Orlebar.

Land shells from Ceylon, by Dr. Leith, and *larvæ* which destroy the mangoe trees, by the Rev. G. Pigott, through Professor Orlebar.

2 Curious Chinese mariner's compasses, by John Turner, Esq. Assistant Surgeon, through Dr. Burnes.

The Secretary read a letter from Captain Postans, accompanied by an English translation of a Sanskrit inscription, relative to the Temple of Somnath, but of which the Society has already a translation by W. Wathen, Esq. which has been printed in the October number of the Society's Journal, now about to issue from the Press.

The Secretary also read a paper on the origin of the *Hamaiyarie* and *Ethiopic* alphabets, arranged by him, and compared with the Hebrew, Phœnician, Samaritan, Mendœan, and Arabic.

Resolved.—That the thanks of the Society be given for the donations and paper presented.

The meeting then adjourned to Thursday, the 13th of February next.

At a monthly Meeting of the Bombay Branch Royal Asiatic Society, held in the Library rooms, on Thursday the 13th February, 1845.

The minutes of last meeting were read and approved of.

Dr. D. Grierson, proposed at last meeting as a Member of the Society, was ballotted for and duly elected.

John Andrew Baumbach, Esq. proposed a Member of the Society, by R. W. Crawford Esq. seconded by J. R. Hadow, Esq. to be ballotted for at next meeting.

Lieutenant J. T. Barr, proposed as a subscriber to the Library, by Major General Barr, seconded by the Secretary, was admitted agreeably to the regulations.

The Committee appointed at the monthly meeting of the 12th December last, to audit the accounts and for other financial objects, reported that the confused state of the accounts prevented them completing the duty assigned them by the meeting; but submitted as accurate an *estimate of the Society's annual income, expenditure, and debt*, as in the yet undetermined amount of deficit, not accurately accounted for, could be made out.—It was evident from this financial statement that the expenses of the Society's *quarterly journal* could no longer be debited to the current income of the Society, but must be liquidated from special subscriptions to this individual object.

In reference to the proposition submitted at the monthly meeting, that the above Committee should name the sum which ought, in their opinion, to be reduced from the usual expense for newspapers and periodicals, it was suggested, by the Members of the Committee, that of the Society's available balance, Rs. 3,680 7 10, not more than one third be in future applied for newspapers and periodicals, Indian and English, and that the other two thirds, (after defraying the expenses of preserving the Museum,) be applied in equal proportions as nearly as may be, in the purchase of, 1st *Novels, Travels, and Modern Works of General Literature*; and 2nd in *Standard Works*. The Committee further reported that the present yearly expenditure for newspapers and periodicals is Rs. 1,635 13, and suggested that a reduction to the annual

amount of Rs. 430, should be made in these expenses. A reduction to the amount of Rs. 398 was accordingly made by the meeting.

The meeting further resolved that the list of proposed works and new editions of works, to be ordered from England, should be circulated to the managing Committee.

The following donations were laid on the table :

To the Library.

1st. Specimens of the illustrations of the rock-cut temples of India, by James Ferguson, Esq., presented by Professor Pole.

2nd, Webb's *Pathologia Indica*, and *Medical Topography of the Ceded Districts*, presented by the Medical Board.

The Secretary read a letter from Captain Cuthbert Davidson of the Bengal Army, and the Nizam's Cavalry Service, inclosing a list of Persian Books belonging to the Library of the *Durgah* of Kulburga; and proposing to forward an account of this ancient city, to be laid before the Society.

Read a letter from Professor Christian Lassen, of Bonn, acknowledging the receipt of copies of the *Visparad Yaçna*, and the first volume of the *Society's Journal*; and acquainting the Society that he had forwarded, through Mr. Richardson, two dissertations of his own, to be laid before the Society.

Read a letter from Professor Eugene Burnouf, of Paris, acknowledging the receipt of the 5th and 6th numbers of the *Society's Journal*, and returning his thanks for the presentation of the work.

Resolved that the thanks of the Society be given for the donations, and for Captain Davidson's kind communication and attention to the objects of the Society, in collecting information relative to places of interest throughout India.

The meeting then adjourned to Thursday, the 13th of March next.

At a monthly Meeting of the Bombay Branch Royal Asiatic Society, held in the Library rooms on Thursday, the 13th March, 1845.

The minutes of last meeting were read and approved of.

John Andrew Baumbach, Esq. proposed at last meeting as a Member of the Society, was ballotted for and duly elected.

Resolved that a special meeting be held on the 25th instant, to take into consideration the propriety of rescinding the resolution passed at the anniversary meeting of 1841, withdrawing the selection of new publications from Messrs. Longman and Co., and of again entrusting those Booksellers with the selection and forwarding of new publications to the amount of £ 200 per annum.

The following donations were laid on the table :

To the Library.

1st. Thornton's History of the British in India with Map, and Thornton's Gazetteer with Map, by Government.

2nd. Falconer's Extracts from some of the Persian Poets, by the author, through Dr. Burnes.

To the Museum.

1st. Coal from the Bolan Pass by Dr. Leith.

2nd. Supposed fossil ribs in trap, Bombay, by R. X. Murphy Esq.

3rd. Specimens of fish, Bombay, by the Rev. G. Pigott.

4th. Supposed fossil fruits and bone from the desert of Egypt, by the Rev. Dr. Stevenson.

5th. Stalactites from the Grotto of Adelsberg Carniola, by Captain Hebbert, Engineers.

The meeting then adjourned to Thursday, the 10th of April next.

At a special meeting of the Bombay Branch Royal Asiatic Society, held, in the Library rooms, on Thursday the 25th March, 1845.

It was proposed by Colonel Jervis and seconded by Dr. Burnes, That the resolution passed at the anniversary meeting of Wednesday the 10th November, 1841, withdrawing the selection of new publications from Messrs. Longman and Co., be rescinded, and that these Booksellers be again entrusted with the selection and forwarding of new publications, but limited for the present to £ 150 per annum, inclusive of all charges for freight and insurance.

The proposition was agreed to unanimously, and the meeting of the Society dissolved.

At a monthly meeting of the Bombay Branch Royal Asiatic Society, held, in the Library rooms, on Thursday the 10th April, 1845.

Read and approved the minutes of last meeting.

The Secretary read extract of a letter from Major Rawlinson, dated Baghdad the 12th of February 1845, intimating that he had lately sent to H. H. Wilson, Esq. Director of the Royal Asiatic Society, a literal translation of the whole of the *Be-Situn Cuneiform Inscriptions*, (about 500 lines) giving a detailed account of the campaigns of Darius Hystaspes, and containing various notices of ancient Persian History of the highest interest.

Extract of a letter from Captain LeGrand Jacob, dated Belgaum 3rd of March 1845, was also read, accompanied by a table of corrections of sundry errors in the lithographed copy of the *Girnar-Asoka-Pali Edict*, published in No. V. of the Society's Journal, and previously translated and commented on by the late James Prinsep.—Captain Jacob intimates that possibly his own copy of the inscription may be defective, but the corrections sent will aid any revised translation of this very ancient inscription, which may be made by other Orientalists.

The following donations were laid on the table :

To the Library.

By the author, Professor W. Pole, M. R. A. S. and of the Elphinstone College.

1st. Prize Essay on the Friction of Steam Engines.

2nd. A tract on the pressure and density of steam.

3rd. A treatise on the art of Painting on Glass, translated from the German.

From Government, 3 printed copies of the proceedings of the Board of Education for the year 1843.

To the Museum.

Fragments of a Greek statue, from Upper Egypt, by Assistant Surgeon Pigou.

4th. Petrified shells, ditto.

Specimen of *Gum Caoutchouc* as collected from the tree, and brought from the island of Borneo, by Lieutenant Robinson, of the Bengal army.

The meeting then adjourned to Thursday the 8th of May next.

At a monthly Meeting of the Bombay Branch Royal Asiatic Society, held, in the Library rooms, on Thursday the 8th May, 1845.

The minutes of last meeting were read and approved of.

Ten Members of the Society not being present, the ballot for Archibald Smart Esq., proposed at last meeting as a member of the Society, was postponed, agreeably to the regulations, till the next meeting.

E. T. Downes Esq., proposed as a member by Captain H. B. Turner, and seconded by R. W. Crawford, Esq. to be ballotted for at the next meeting.

The Secretary read a letter from Comte Auge St. Priest, President of the "Scientific Commission for the discovery of American Antiquities," dated Paris, 5th February 1845, requesting the sympathy and aid of the Bombay Branch Royal Asiatic Society in promoting a proposed expedition for the investigation of American Antiquities, composed of English, French, and German Literati, who are to be associated in this undertaking under the auspices of the above Commission.

A letter from M. Pirtz, Director of the Royal and University Libraries of Berlin, acknowledging the receipt of the *Yaçna and Visparad*, was also read, and expressed grateful obligations to the Society for the presentation of these works to the institutions, of which M. Pirtz is the director.

The following donations were laid on the table :

To the Library.

By the author, V. Fontanier, *Voyage dans L'Inde et dans Le Golfe Persique, par L'Egypte et la mer Rouge*, accompanied by a letter.

The Rev. J. M. Mitchell then submitted a paper on the Theological dogmas and practical religious ceremonies of the Parsees, accompanied by notes: for which, and the donation to the Library the Secretary was directed to return the thanks of the Society.

The meeting then adjourned to Thursday, the 5th of June next.

At a monthly Meeting of the Bombay Branch Royal Asiatic Society, held, in the Library rooms, on Thursday the 5th June, 1845.

The minutes of last meeting were read and approved of.

Archibald Smart Esq. and E. T. Downes Esq., proposed as Members of the Society and duly seconded at previous meetings, were ballotted for and unanimously elected.

Read extract of a letter from Captain Haines to the Secretary, announcing that 68 Hamaiyaric inscriptions were lately brought from the ancient Mareb, by J. Arnauld, a French Apothecary, who shewed them to Captain Haines, but declined to permit him to take copies of them. M. Arnauld had since presented these to the Asiatic Society of Paris, which was about to present a copy to the Royal Geographical Society of London, for decyphering by the Rev. Mr. Forster.

Read a letter from William Hamilton, Esq., Secretary of the Geological Society of London, acknowledging the receipt of Nos. 5 and 6 of the Journal of the Bombay Branch Royal Asiatic Society, and expressing the thanks of the Geological Society for this acceptable present.

Read a letter from Sir Erskine Perry, accompanied by nine volumes of the annual reports of the Poor Law Commissioners, and one volume of the report of Her Majesty's Commissioners on Criminal Law. The letter recommended that the Society should obtain in continuation the reports of the Poor Law Commissioners as they are published; which recommendation will be sent to Messrs. Longman and Co. with instructions to select from and forward such parts of the Poor Law reports as may be obtained for the Society at a moderate annual expense.

Read a letter, from William Escombe, Esq. Secretary to Government in the General Department, acknowledging the receipt of the Secretary's letter dated the 13th ultimo, acquainting the Society that the Honorable the Governor in Council, is pleased to subscribe for *twenty five copies* of the Society's Journal, and requesting that contingent bills for the cost of the Journals be submitted by the Society.

Read a letter from Mr. J. McCudden, dated Poona, the 24th May, accompanied by a prospectus of a work entitled "Oriental Eras," comprising those in use among Christians, Hindus, Mahomedans, Parsees, &c., accompanied by Chronological notices of important events in India and the East, and requesting the Society would become subscribers to the work. The Society agreed to Mr. McCudden's request.

The following donations were laid on the table :

To the Library.

1st. By the Translator, the History of the defection of the United Netherlands from the Spanish Empire, translated from the original German of Schiller, by Lieutenant E. B. Eastwick B. I. 1 volume.

2nd. No. II. of Illustrations of India Ornithology, by T. G. Jerdon Esq., Madras Medical Establishment.

3rd. By Sir Erskine Perry, Kt. 9 volumes annual reports of the Poor Law Commissioners.

The Secretary then read a paper containing observations on the coins of *Undophares*, or *Gondophares*, who is traditionally said to have been the co-temporary of St. Thomas the Apostle.

The Secretary was directed to return the thanks of the Society, for the various donations, and the meeting adjourned to Thursday the 3rd July next.

JOURNAL
OF THE
BOMBAY BRANCH
OF THE
ROYAL ASIATIC SOCIETY.

JULY, 1847.

ART. 1.—*Notes on the Mahrah Tribe of Southern Arabia, with a Vocabulary of their language, to which are appended additional Observations on the Gara Tribe.* By Assistant Surgeon H. J. CARTER, Bombay Establishment.

In presenting to the Society this vocabulary of the Mahrah dialect, I regret that I have so little information to add to it, concerning the manners and habits of the people by whom it is spoken.

The Mahrah tribe (مهره), descended from the ancient Hamyari of Hadramaut, occupy an extent of country exceeding that of any other tribe in the southeastern part of Arabia. The limits of their coast are generally allowed to be the opening of the great Wadi Masilah, on the S. W, in $51^{\circ}13'$ E. Long. and the town of Damköt (دمقوت), in the bay of Al Kamar, on the N. E, in $52^{\circ}47'$ E. Long., giving them a coast-line of about 135 miles; thus, while we have it in our power accurately to determine their maritime boundary, we know little or nothing of the extent of their country inland, though we may justly infer that the tribe is spread over an immense area, for, if we talk of entering Hadramaut by Makalla, the people of that place tell us we shall be assailed by the

Mahrah tribes on our way, and if we ask the inhabitants of Marbât, three hundred and sixty miles north-east of Makalla, what inland tribe comes next to the Beni Gara, their answer again is, the "Mahrah," while the Mahrahs themselves affirm that the divisions of their tribe extend to the confines of Hadramaut.

Like the other great tribes, they have their divisions, their subdivisions, and their families or *báils* (بيت); but being so numerous and spread over such a vast extent of country, they are as much at war with each other, as if each division and subdivision were an independent tribe of itself.

In stature the Mahrahs are generally undersized, and when compared with their eastern neighbours, the Beni Gara, may almost be considered diminutive. In speaking however of their characteristic features, it should be understood that my observations are entirely confined to those who inhabit the southeastern borders of their territory. They are by no means a handsome race, for their features are for the most part short and irregular, their eyes small, sunken, black, and piercing, with a cunning and very frequently a sinister expression of countenance. Their dress is the same as that of the Garas, and likewise their arms, excepting that the double pointed stick is not commonly used among them. In their mode of salutation they touch each other's fingers in the manner of the Garas, but instead of kissing them afterwards, they bring their noses in contact with each other, side by side, and at the same time gently, though audibly, inhale the air through their nostrils. Their mode of subsistence follows their position; those of the interior live principally on milk and flesh, with now and then dates and a little *durah*, if they can afford to purchase it. The latter is ground in a mill called a *matahanét* (مطحنت), which consists of a flat oblong slab of stone, and a kind of rolling pin, moved backwards and forwards by a single person.—While the Bedwins of the interior live principally on milk and flesh, those on the coast seldom get any thing more than fish and dates. The fish they take, either in nets, or with a hook and line; but as few can afford to purchase either boat, or nets, and as they are not in the habit of using the inflated skin or *kirbah* (قربة), mentioned by Ptolemy, and so common on the coast to the northeastward of the bay of Kuria Muria, they drop their lines from the projecting shelves of cliffs, which overhang the sea.

have seen them with their shields and swords crawling down the precipitous side of *Ras Fartak*, which looks towards the bay of Al Kamar, where the cliffs in many parts, present a scarp 1,900 feet high; and our Pilot, who was from that neighbourhood, assured me that annually, one out of seven, or certainly one out of ten, perished from a false step, while prosecuting this perilous descent to obtain their daily food. Yet such is the force of habit and example handed-down from their forefathers, and also that of necessity, (for the extreme poverty of the different tribes admits of no pretext, under that of war, for any encroachment made by their neighbours on their several territories, in quest of food for man or beast,) that the *Bait Saloam* (سلوام), who dwell on the barren ridge of *Ras Fartak*, have no other alternative than to descend daily for this miserable support, or perish above from a want of nourishment.

The Mahrah fishermen have also another contrivance for taking large sharks, and a species of ray exceeding sometimes fourteen feet in breadth, which frequents this coast. This consists in "rigging out a *darak*" (to use a nautical phrase) from the side of a cliff, with a pulley in the end of it, over which the line plays; in this way having chosen a favorable spot for fishing, they raise up sharks from eight to ten feet long; and having divested them of their fins, salt and dry the flesh for food, and sell the former to the Nakhudas of Bagalos, who trading along this coast purchase them for the China market. I may here mention that not only among the Mahrahs, but with all the inhabitants of the southeastern coast of Arabia, *Lahm* (لحم), or the dried flesh of sharks, is the staple article of food and commerce.

The Mahrahs are miserably poor, and their plains, mountains, and valleys, with the exception of the highland of *Hattob* (حطوب) close to Damköt, are rocky, sandy, and almost barren. They call the distant land lying due north of their coast, the *Arz-al-ahkaf** (ارض ال احقاف).

Religion they have little, or none. I was informed by our Pilot that it was only here and there on the coast that you met with a man, who could say his prayers, while the Bedwins of the interior were wholly devoid of religion, having no idea of God or devil, of heaven or of hell.

The Mahrah dialect, as spoken by the Mahrahs themselves, is the softest

* Meaning the region of sand-heaps.—Editor.

and sweetest language I have ever heard; indeed, they appear to be so sensible of this, that they liken their *kalam d'Mhari* (كلام ذمهاري) as they term it, to the conversation of birds (مثل كلام الطير). In my vocabulary I shall refrain from making any philological observations on it, preferring to leave this part open to the learned Secretary, whose extensive knowledge of the subject is so unquestionable that I am sure nothing will escape his notice, which is deserving of interesting or useful remark. All therefore that remains for me to do, is merely to offer the few preliminary observations which are necessary to convey to the reader an idea of the sounds of certain letters, and the pronunciation of the words in which they are introduced, leaving the *Arabic* spelling of the words exactly as they were written for me, by Mohammed bin Hamed *Mahri*, Pilot on board the H. C. Surveying Vessel *Palinurus*, in the Bay of Al Kammar, and resident of the village of *Ahsoel* (احصول), eight miles west of *Ras Fartak*.

ACCENTS.

Long accent (-), *short accent* (˘), *diphthong* (ˆ).

RENDERING OF VOWEL SOUND.*

<i>a</i>	as	<i>u</i>	in	<i>but</i>	<i>oo</i>	as	<i>oo</i>	in	<i>boot</i>
<i>ee</i>	as	<i>ee</i>	in	<i>see</i>	<i>ē</i>	as	<i>ay</i>	in	<i>say</i>
<i>i</i>	as	<i>i</i>	in	<i>thin</i>	<i>é</i>	as	<i>ey</i>	in	<i>they</i>
<i>o</i>	as	<i>o</i>	in	<i>note</i>	<i>ao</i>	as	<i>ow</i>	in	<i>how</i>

¹, for the most part has not a broad sound; thus, *مهرا* with the Mahrahs has almost the same sound as that of the proper name Mary.

ج, is generally pronounced soft; I may here remark that *مجار* forms as good a word as can be adduced for the purpose of giving the different pro-

* The system of orthography, followed by the author in his vocabulary of the Mahrah dialect, though not that usually followed in the Journal and other oriental publications, has been left unaltered except in the body of the notes, where it has been changed for that more commonly adopted by Orientalists.—*Editor.*

nunciations of this consonant along the southeastern coast of Arabia. Thus, it is pronounced as in *Hebrew*, by the inhabitants south of Maskat, and about Ras Al Had; *hard*, by the people of Dofar, and the inhabitants of the coast between Makalla and Aden; and *soft*, by the Mahrahs. By the first, it is called *Sair*; by the second, *Saghar*; and by the Mahrahs, *Sajar* or rather *Zājar*. Vide ص.*

ش, has a very peculiar sound in the Mahrah dialect; it is formed by placing the tip of the tongue against the anterior part of the palate, and allowing the air to pass out of the mouth on one side or the other of it, in the manner of a lisp, following it with the sound of the letter *l*, as in شيوط *fire* pronounced *shleeote*.

ص, has the softer sound of the letter *z*, as ما جر which is pronounced *Zājar*.

ع and غ, have their peculiar sounds, and sometimes the latter has the sound of *q* in *qui* (F) as in غيغ *man* pronounced *qaij*.

In the *English* spelling, however, of the Mahari words, I have endeavoured to give the pronunciation of the Mahari who dictated them to me, without much reference to the literal rendering of the Arabic character. This, which would be disadvantageous if the *Arabic* spelling was perfect, becomes the reverse in the present instance, where the pronunciation will frequently point out the inaccuracies of the Mahari orthography.

"Notes on the Gara Tribe;" continued from p. 201 *Journal* No. ix. p. 201. 1845.

Since my notes of last year were presented to the Society, I have again had an opportunity of mixing with the Gara tribe; which, while it afforded me the means of collecting a little more of their history, has enabled me to define more correctly the coast-limits of the district they occupy.

Formerly, these were stated to be the town of *Marbat* on the northeast,

* In these observations the Arabic orthography of the names of three different portions of the south eastern Arabian Coast appears to be confounded: namely the tract of country called after the now desolate fort of *Al-Shihir* (الشحر) in lat; 14 38 30 N. longitude 49 27 35; the Cape of *Shajr*, شجر between Ras Fartak and Ras Marbat; and the town and district of *Sohar*, or *Zohar*, صحر on the coast of Oman.—Editor.

and *Ras Al Sajar* on the southwest, but, since I gathered this information from the inhabitants of *Dofar*, an intercourse with the *Mahrahs* and *Garas* in the bay of *Al Kamar*, during its survey, has enabled me to fix with more accuracy the exact line or neutral ground of demarcation between the two tribes on the west; while as regards the east, I have elicited from different sources the fact, that the *Beni Gara* are the sole inhabitants of the *Sabbhan* mountains, which extend from *Marbat* to *Hasek*. Hence it will appear, that, instead of *Marbat* and *Ras Al Sajar* being the true limits of their coast, the village of *Hasek* will be the northeast, and, as ascertained from the united testimony of the *Mahrahs* and *Garas* in the bay of *Al Kamar*, *Ras Tharbat Ale* ظربت علي will be the southeast termination of their maritime boundary. Between *Ras Tharbat Ale* and *Damkot*, there are as many *Mahrahs* as *Garas*, therefore this interval may be considered neutral ground.

Respecting the *Tribes*, whose several districts come next the confines of the mountainous tract inhabited by the *Beni Gara*, I have not been able to obtain much satisfactory information. The *Mahrahs* come next to them in the bay of *Al Kamar*, but at *Hasek* there are remnants of several tribes, the principal of which are the *Gara* قرا, *Mahra* مهرا, *Afar* عفار, *Hassarit* حسريت, and the *Baramah* برمعه; while all the towns in *Dofar*, with the exception of *Tagah* and *Marbat*, are inhabited by the *Al Kathiri* الكثيري, who originally came from *Hadramaut*, and are always at war with the *Beni Gara*. Next the *Garas*, inland, I am told, are the *Thoar* طور, a large branch of the *Mahrah* tribe, the *Afar*, also a large tribe, and the *Al Kathiri*; these inhabit the table land called *Nejd*, or *Nejdi* نجد ونجدي, on which the frankincense tree grows, two days inland from the shore.

The *Mahrahs* and *Garas* affirm that they are descended from the ancient *Hamyari*, and that the *Afar* and *Al Kathiri* are descended from the *Ghafiri* غافري

The following are some of the principal branches of the Gara tribe.

BENI GARA OR HAKLI.

بنی قراحکلی

Bin Kahtan..... بن قحطن	Báit Kashob..... كشوب
Báit Mashanee..... ما شني	—Jabob..... جبوب
—Ayesa (<i>Esau</i>)..... عيسا	—Ghajod..... قجاود
—Makheir..... مخير	—Said..... سعيد
—Tabok..... طبوك	—Témin..... تيمين

Several of the Garas assured me that Gara and Koreish were synonymous,* and that the latter was their ancient appellation. But to ascertain this more satisfactorily, I took the opportunity of asking the chief Shaikh of the Garas, in the presence of an influential Saiad, with whom I was then staying, if it were from his tribe that the prophet Mohammed sprung, and what was the ancient name of his tribe? To the former he replied in the affirmative, to the latter, "the Koreish." In both instances he was contradicted by the Saiad. By another person, however, who was called upon in the presence of a large assembly, as an authority in matters of history, to give me some information about the neighbouring tribes, I was told that the Garas and the Koreish were *not* the same people. Here the question rests, so far as I had an opportunity of determining it, but, as the matter is not altogether devoid of interest, I relate the observations for whatever, in the hands of others, they may prove worth.

Besides Gara, they are also called Haklee, and at the present time the two terms are used synonymously, though the first is by far the most general appellation.

The *Kahtan* family or branch, is considered the head or root of the Garas, and the Shaikh of this family, the Shaikh of the Garas; Salim bin Thooree bin Kahtan, is the name of the present Shaikh; it was this man, who in a *blood feud*, murdered Saiad Mohammed bin Ageyl, the late governor of Dofar. Standing erect, he is full six feet high, finely proportioned, with most manly and handsome features, combining, with a generous expression of countenance, all the gentleness and determination, that could be sought for in the most chivalrous character. Though the murderer of the last governor of Dofar, (under whose sage but severe discipline that district was restored from the wretchedness of the worst state of anarchy, to a condition of ease and prosperity, and whose loss, by all the tribes inhabiting Dofar and its neighbourhood, has not failed for the last fourteen years, to prove a source of the most bitter lamentation) this man, (ignorant of the crime he had committed, in the eyes of an Englishman, and satisfied of the rectitude of his conduct as a Gara Chief,) calmly asked, why the English, knowing the extreme fertility of the district of Dofar, and the wretched state of the inhabitants for want of a ruler, did not send some one to take the country, and give them the benefit of our good Government. The

* The Koreish being the tribe from which the Prophet Mohammed derived, his origin, is it not probable, that if there be any truth in this assertion, the tribe of Garas derive their appellation from having early possessed, a knowledge of letters, as the word *Kara* قرأ literally signifies one who practises reading?—*Editor*.

Kahtan family are regarded as the great fighting men of the *Gara* tribe, and it is said that five *Kahtans* are enough to put to flight the whole of the *Beni Gara*.

To shew the faithful manner in which the duties of *Rabeea* ربيع or *Protector*, are discharged in this tribe; how a man having a *blood feud* with another party may enter with security the territory of his adversaries; and under what circumstances a *blood feud* may be established, I may mention the following act of one of the *Kahtan* family, who accompanied a friend as *Rabeea*, from the mountains behind *Dofar* to the town of *Silalah*. When arrived in *Silalah*, two of the *Rabeea's* cousins approached the man whom he was protecting, and assailed him on account of a *blood feud*, which formerly existed between them. The *Rabeea*, (now the decrepit figure, of a once tall and powerful man, and who was sitting by me, when the *Saiad*, with whom I was staying, related the story,) faithful to his pledge, and having no alternative but to slay his cousins, did so, with as many blows of his sword, while the friend whom he protected fled back to the hills, and the *Rabeea* claimed the *Saiad's* protection until a large party arrived from the mountains to guard, and conduct him back to his own clan. In this act, we observe the binding nature of the pledge,—the *Rabeea* opening a *blood feud* with another party, his own relations for the sake of faithfully discharging the duties of the office he had undertaken. Such instances of fidelity are by no means uncommon among the wild and ignorant *Bedwins*. The *blood feud*, as a matter of course, is greatly dreaded by all, for it not only immediately excites families to mortal combat, but if remaining unsettled, which is most commonly the case, entails all the misery and bloodshed connected with it on the next generation, by whom, if not satisfactorily decided, it must descend to the third and fourth, and so on, until it is either amicably arranged or entirely forgotten. Thus, with the two men murdered by the *Rabeea* above mentioned, who belonged to a distant branch of his own family, their sons are still boys, but when they arrive at manhood, they will be expected by their nearest relations to take up the *blood feud*, occasioned by the murder of their fathers, and will either kill the old *Rabeea*, or if he be dead, two of his branch of the family. A *blood feud*, such as this is, arising between two branches of the same family, is considered the worst; it is blood against blood. In the assault of the young men, when they are grown up, on the *Rabeea's* family, they themselves may be killed, or instead of only killing two of the *Rabeea's* family, they may mortally wound three; in the first instance, instead of a *blood feud*, on account of two, there will be one of four against the *Rabeea's* family, while in the second instance, a *blood feud* will still exist between the families on account of the murder of a third person,—one more than was required from the *Rabeea's* side.

The difficulties which attend a *blood feud* may be endless, and the conse-

quences are disastrous, and although they tend greatly to restrain the Bedwin from committing bloodshed, and contribute much to protect his life, yet they are too often disregarded by this "wild man," who under the influence of passion will frequently commit murder on the most trivial occasion.

Note. For Gharah غارة read Gara قرا in my "Notes on the Gharah Tribe" published in No. ix of this Journal. It is also written قرة H. J. C.

VOCABULARY OF THE MAHRAH DIALECT.

English	Arabic	Maharee	Pron: of Maharee.
Age.....	عمر.....	عامر.....	āmar
Angry.....	غضبان.....	مغنيظ.....	maghateeth
Arms Pl. (body)....	الاذرع.....	حيد وتن.....	hēidotan
Army.....	عسكر.....	عسكر.....	askēr
Ant.....	نملة.....	نوميل.....	pomeel
Antimony.....	كحل ائمد.....	كا حل.....	kahil
Appetite.....	توق.....	توك.....	tōq
Anchor.....		بهرت.....	boharat
Ashes.....	رماد.....	رميد.....	rameet
Arrow.....	سهم.....	سهم.....	sahom
As before.....	كما اول.....	هاش هو الا.....	hash hawalee
Above.....	فوق.....	حقلا.....	haghla
Afterwards.....	بعد.....	صغورا.....	maghora
Always.....	د ايماء.....	د ويم ذ اوقات.....	doem da aukat

B.

Bad.....	شرير.....	يغمو م.....	yaghmom
Bravery.....	بلاطة.....	حروبي.....	harobe
Back.....	ظهر.....	ظحرموتن.....	dhara mōthan
Bone.....	عظم.....	عظم.....	athēth
Blood.....	دم.....	دم.....	doom
Belly.....	بطن.....	جوف.....	djof
Brother.....	اخ.....	غاك.....	ghak
Blind.....	اعمي.....	عوريت.....	awareet

Body.....	جسد.....	jassēd
Beard.....	لحية.....	alhēt
Bowels.....	مصارين.....	mosghén
Bread.....	خبز.....	khābs
Butter.....	زبد.....	khazarét
Black.....	سود.....	haowar
Blue.....	كحلي.....	haowar
Bracelet.....	ساور اقروطه.....	matakēt
Book.....	كتاب.....	katob
Bed (of sleep).....	سريـر.....	jodaree d ashan't
Battle (land).....	قتال.....	ghorāt
Barren.....	مصحال.....	héoor
Brook.....	جدول.....	hazabōt d'nahr
Branch.....	عصن.....	ratāt
Bark.....	قشرا لشجرة.....	kasheeroot
Blade of grass.....	السرخ.....	rahoot
Brass.....	نحاس.....	nahos
Bite.....	عصه.....	sob
Bitterness.....	مرارة.....	mareer
Blow.....	لكمة.....	alkamēt
Bird.....	طير.....	agāb
Bug.....	كتون.....	kāton
Bridle.....	لجام.....	ghāīanej
Bull.....	ثور.....	thor
Bow.....	قوس.....	mandofēt
Boat.....	سنبوق.....	sambook
Bee (honey).....	نحل.....	hanobēt
Beak (of bird).....	منقار.....	akhoh
Behind.....	خلف ورا.....	manghēira
Below.....	تحت.....	amsa
Bad.....	بطل.....	yaghmom
Balance.....	ميزان.....	meezon
Brain.....	دماغ.....	damagh

Bagalo.....	بغلة.....	سایت.....	sâit
Bottle.....	لوقت.....	لوگت.....	logat
Buoy.....	کوي.....	کوي.....	koeë

C.

Cow.....	بقرة.....	بقريت.....	bakarét
Cash.....	فلوس.....	درهم.....	darecham
Cold.....	برد.....	قاسم.....	kasim
Children.....	اولاد.....	قلیان.....	galleean
Cheek.....	حدود.....	ظجمتک.....	thajamatak
Chin.....	دقن.....	ملحوت.....	malhôt
Coffee.....	قهوت.....	قهوات.....	kâwét
Comb.....	مشط.....	مشريق.....	mashareek
City.....	مدينة.....	رحبات.....	rahabét
Coffin.....	صندوق الميت.....	منعش ذامیوت.....	manhosh da meeoot
Conqueror.....	غالب.....	خزة.....	khäzä
Conquered.....	مغوب.....	فوصل.....	fösal
Cultivated.....	مفلوح.....	قاجيد.....	kajoed
Cloud.....	سحاب.....	عفور.....	afoor
Clouded.....		عفورماکن.....	aför maikan
Camel.....	جمل.....	هيبيت.....	héibet
Cat.....	قطه.....	اسنورت.....	assanört
Cock.....	ديک.....	ديک.....	deek
Copper.....	غاس.....	صافر.....	sāfār
Cotton.....	قطن.....	غوزل.....	ghozäl
Cocoanut tree.....		ميدا.....	mēda
Crooked.....	حنو.....	عواج.....	aowaij
Clear (op. foul).....	رايقه.....	سوال.....	soal
Calm a (sea).....		شوال.....	shoāl
Clothes.....		خلواق.....	khaloq
Corn.....	قمح.....	عمال.....	amēl
Colours (to hoist).....	بيرق.....	غلي بيريقي.....	ghala bériq
Creeper (anchor).....		بروصي.....	barosee
Crying.....		تبیک.....	tabeck

Cable	مسبو	masabooa
Colt	عفو	habarēt
Crab	حيشي	héishee
Chain	سلسلات	salsalét
Cover (book)	قرطوس	gartos

D.

Dry	يابس	قوشا	kōshā
Dog	كلب		id.....
Death	صوت	ميوت	meeoot
Dumb	اعرج	عجم	ajam
Deaf	طرشة	سقيت	sakeet
Day	يوم	نهور	nahoor
Dawn	فجر	فا جر	fējar
Defeat	هزيمة	هبوذ فرعم	habo da faram
Deep	عميق	غازر	ghazar
Dark	مظلم	كتوي	katéwee
Donkey	حمار	حير	hêir
Duck	وردك	مقوقوات	makokwat
Dove	حمامة	عيثار	âithar
Date	تمر	تومر	tōmar
Disease	مرض	مريض حول الع	mareedth hamol aloo
Dokhan	ذحن	داخن	dākhan
Dthurah (grain)	ذرة	ذريت	dtharét
Date-tree		ناخل	nākhil
Dolphin		صعوبون	saobōn

E.

Eight	ثمانية	ثمانيت	thimaneet
Bars	اذن	حيذان	héidthén
Eye	عين		id.....
East	مشرق	شرقوت	sharkoot
Earth	ارض		id

Eyebrow.....	حواجب.....	احجور.....	ahajōr
Eyelid....	شقوق العيون.....	شقرين لعينتك.....	shakareen al âientak
Empty.....	فادغ.....	خلي.....	khalec
Eggs.....	بيض.....	ibd.....	
Earning.....	حلق.....	حلاق.....	hélêk
Evidence.....	برهان.....	برهون.....	barhon
Enemy.....	عدو.....	عدوناغل.....	âdo-naghal
Eagle.....	نسر.....	نوهر.....	nohar
Ear (of corn).....	سنبلا ت.....	سبلات.....	sibalat
Entertainment.....	دفنة.....	الجف ذاقوبر.....	alegaf d'gobar
Easy.....	سهلة.....	سهيل.....	saheel
Ever.....	ابدن.....	الوم.....	alôm
East-wind (N. E?).....		هازياب.....	hazeeb
Edge sharp.....		حدمكن.....	hud mēkân

F.

Fat.....	سمين.....	صالح ما لحات.....	salah or salhét
Fishing line.....	تين.....	غلف.....	ghalf
Fidelity.....	اصمان.....	مشرة.....	misharee
Face.....	وجه.....	واجه.....	wojah
Fire.....	نار.....	شيوط.....	shleeōt
Father.....	اب.....	حبيب.....	héb
Flesh.....	لحم.....	تيوي.....	teewee
Frankincense.....	لبان.....	شيعز.....	sheeaz
Fingers.....	اصبع.....	شوبع.....	shōba
Foot.....	قدم.....	مدحاكك.....	madhakak
Four.....	اربعه.....	ربوت.....	robōt
Five.....	خمسة.....	خموة.....	khomo
Full.....	فملو.....	ملون.....	malon
Fish.....	سمك.....	صيد.....	sêit
Fort.....	طابية.....	قلعت.....	kālāt
Fertile.....	مخصبه.....	قاجيت.....	kājeet
Feathers.....	ريش.....	قطانوف.....	katafōf

Frog.....	ظفزا ت	dthafzāt
Fins.....	علفوت	alfōt
Fly.....	ذباب	hadthabét
Flea.....	برعوث	hashmēt
Flower.....	ذهر	athéree
Famine.....	قحط	zabōn
Fatigue.....	عنا	tābak
Friendship.....	صديق	sadeeq
Flint (for striking light).....	صوان	aibal
Fever (ague).....	حمة	joloo
Forehead.....	حبهة	feesit
Foul (op. to clear).....	كدار	kadér
Fox.....	ثعلب	āthal
Fish-hook.....	ميدار	
Far.....	بعيد	rēhak
Flock of sheep (whose?).....	ها رون المون	hāron almōn
Flying fish.....	فريفرت	féreefart
Fear.....	خوف	fazak

G.

Goat.....	معذا	hoz
Goat, she.....	معذت	hoz bees shakhof
Green.....	اخصور	ahdthoor
Grand-father.....	جد حب ذ احيبك	déidak
Grand-mother.....	ست	hamēdthmēk
Gold.....	ذهب	dtheeb
Gate or door.....	باب	bob d'madeent
Gun (cannon)....	مدفع	Id.....
Gunpowder....	بارود	Id.....
Goat, he....	جدي تيس	teyah
Grain.....	حب	āsh
Gravel.....	حصا	hafash
Grief.....	حزن	hazanōt

Good.....	طيب.....	مشرة.....
God.....	الله.....	بعلبي..... Bālee
Girdle (leather).....	حول.....	haḥbal
Gazelle.....	غزال.....	sār
Grass (for sheep).....	حشيش.....	شجار الحارون..... shajar al haron
Garden.....	جنينه.....	ذابر..... dahabar
Gum arabic.....	صمغ.....	صمغ..... samagh
Girl.....	بنت.....	غجيت..... ghajeet

H.

Hen.....	دجا جه.....	دجوجت.....	dijojat
Honesty.....	عدل.....	مونت.....	monat
Hand.....	يد.....	حيد.....	hēid
Head.....	راس.....	حروة.....	haroh
Hair.....	شعر.....	شف.....	shof
Heart.....	قلب.....	Id.....	
Half year.....	نصف سنه.....	فقم ذ سنات.....	fakah da sinat
Hot.....	حر.....	حرق.....	haraq
Horse.....	حصان.....	احصون.....	hassōn
Hoofs (of horse).....	حوافر.....	مرظام ذ حصون.....	marthan d'hasoon
Horns (of goat).....	قرون.....	قرون الحوذ.....	karon al hoz
Hide.....	جلد.....	Ibd.....	
Hunger.....	جوع.....		
Hurt.....	مصرة.....	جياك.....	jeeāk
Heavy.....	ثقل.....	شيببر.....	sheebar
Hire.....	كرا.....	كيرا.....	keeree
Heaven.....	الهل خير.....	ذ الهل خير.....	dthal al khér
Hell.....	الهل شيوات.....	ذ الهل شيوات.....	dthal al shleeōt
Honey.....	عسل.....	عسل.....	
Hair-band (bedwin).....	قد يد.....	kadeed	
Heel.....	عقب.....	مرظامك.....	mardthāmak
Husband.....	زوج.....	غيجيس.....	qājās
How?.....	كيف.....	يبوه.....	yeboh

Hare.....	ها رنا ب	harnab
Here	هنا	boh
Herd of Cattle whose ?.....	بقا را المون	bagar al mon
Herd of Camels whose?.....	ريكوب المون	rékobal amon
Hook (fishing).....	قلا و	kalaò

I. J.

Judge.....	قو ظي	kodthee
Iron.....	حد يد	Id.....
Infant.....	غيجان قنون	qáijan ganoon
Inscription (on stone).....	مكتبة	katob b'saowar
Joy.....	فرح	Id.....
Jambeea.....	جنبيت	jambeea
Ibex	واعل	wāal
I.....	انا	hoae
Indigo	صبغ	sabagh
Idle.....	كسلان	kasool

K.

Kid.....	اهو طر	ahotar
Knee.....	برك	barak
Knife.....	عيس	ús
Kick	مركظا ت	markadthat

L

Looking-glass	ميروت	méroot
Liver	خنفيش	khanfesh
Lie.. ..	بادي	bāde
Leg.....	لشرينك	lasharank
Lip	كرفيف	karfeef
Laugh.....	ظحوك	dthahok
Light.....	ظوي	dthōee
Left.....	حيمل	héimal

Large.....	كبير.....	إثاخ.....	théakh
Lamp.....	مصباح.....		Id
Lofty.....	عالية.....	راحق.....	rahak
Lizard.....	برص.....	ظوب.....	dthob
Louse.....	قملة.....	كنميت.....	kanamét
Leaf (Pl).....	ورق.....	صاف.....	saf
Lime.....		نورت.....	norét
Light (op. heavy).....		خفيف.....	khafeef
Lame.....	اعرج.....	ثبار.....	thabēr
Lend.....	رصاص.....	رصوص.....	rassos
Lungs.....	فشه.....	نسامك.....	nasēmak
Lightening.....	برق.....	بورق.....	boriq
Love.....	صحبة.....	عجبك.....	ojbak
Loose (vest).....	عريض.....	شاخ.....	shēkh
Less.....	قليل ولا.....	شي خور.....	shee khor
Land high.....	نجد.....	بديت.....	badeet
Land wind N. W ?.....		نعشي.....	nashee

M.

Man.....	رجل.....	غيج.....	qájj
Milk.....	حليب.....	شخوف.....	ishakhof
Mouth.....	فم.....	خوك.....	khok
Mother.....	ام.....	هماك.....	hamēk
Month.....	شهر.....	ورخ.....	warakh
Morning.....	صباح.....	كصوبح.....	kasobah
Moon.....	قمر.....	واريت.....	wareet
Mane.....	شعر رقبة البهايم.....	شوف الحسون.....	shoof al hassōn
Mourning.....	ممر مر.....	قميس.....	gamees
Mill (of. Marhahs).....		مطحانات.....	matahanēt
Mill (of India).....		راحات.....	rahāt
Mule.....	بغل.....	بغلأت.....	baghalét
Musquitoe.....		ذرذير.....	dthardtheer
Merchant.....		اتجار.....	tajeer
Massack (skin).....	قربة.....	حنيت.....	hanét

Mist.....	ضباب	غبرات	ghabrét
Mountain.....	جبل	جبال	jibāl
Monkey.....	قرد	منجه	minjah
Misfortune.....	نكبت	متوت	matôt
Match (of matchlock).....		فتيلت	fateelat
More.....	اقطار	هزدي	hazdee

N.

Night.....	ليل	بحلي	bahalee
Nose.....	انف	نخريير	nakhareer
Nostril.....	منا خيز	فلخرنتك	fankhar antak
Nail (of fingers &c).....	اضافر	ظفروتن	dthafarotan
Nine.....	تسعه	اسات	isét
Necklace.....	قلادة	مريت بغوثي	mariyet baghot-
			hee
Now.....	الان	لعضومة	lasōma
Nitre.....	شورة	عديت	adeet
New.....	جديد	هيدان	hêideen
Net (large).....		منقع	mange
Net (cart).....		مغوير	maghweer
Noise.....	حس	هيم	hém
Neck.....		غوئي	ghothee

O.

Oil.....	ذيت	سليت	saleet
Old.....	سبخ	هاخر	hēkar
Oath.....	قسم	Id	Id
One.....	واحد	طاد	tād
Ostrich.....	نعم	قيظر	kéithar
Opposite, in front.....	قدام	فنوون	fanowan
Old (cloth).....	قديم	داويل	dāweel
Old man.....	شيبه	هاخر	haēkar
Old woman.....		عاجوز	ajoz

P. Q.

Patience.....	صبر	صبور	saboor
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Pen.....	قلم	قلام	kalām
Quickly.....	فيما	سميح واتوكي	samah watokee
Quarter.....	ربع	ربات	rabet
Palace.....	قصر	قاصر	kāsar
Palm (of hand).....	كف	رحت	rahat
Pearl.....	لؤلؤ	Id	Id
Prisoner (of war).....	مورثوق	هوثك غيج	hothak qāij
Pistol.....	قرد	طابنجه	tabanjah
Plain.....	سهل	حيق	hēik
Pain.....	الام	بشر	bashar
Protector.....		ريبع	reebā
Perspiration.....		نغال	naghal
Poison.....		سم	sam
Pit.....	خفرة	محفروت	mahafaroot
Porpoise.....		معيلي	macelee

R.

Red.....	احمر	عوفر	aofār
Rib.....	ضلع	ضيلع	dthēlah
Rain.....	مطر	رحمات	rahamét
Right (op. to left).....	يمني	شيمل	sheemal
Ring (for finger).....	خاتم	خوتم	khotim
Rock (large).....	صخرة	صورحنبوب	sowar hanob
River.....	نهر	ناحر	nahar
Rainbow.....	قزح نفاجه	قذات	kazat
Rat.....	جردون	جراذ	girēd
Root (of tree).....	اصل	عروق	aroq
Rice.....	رز	حيراذ	hēraz
Rope.....	خبل	قيود	keeood
Ruin (of anct : building).....		برهيس واقت	barhēs wakat
Road or way.....		حورم	horam

S.

Shade.....	ضل	هولا	hawala
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Sincerity.....	صد ا قة	صد ق ا ت	sadigat
Scorpion.....	عقربة	قدين	kabeen
Spider.....	عنكبوت	شبكة	shabakeet
Sea.....	بحر	رورم	roram
Sheep.....	نعجة	ثيوت	theewet
Salt.....	ملح	ملحات	malhat
Serpent.....	حية	دبت	dabat
Shoulder.....	كتف	كتفه	katfa
Skin.....	جلد	جلدت	jaladét
Side.....	جنب	جنبتك	jambatak
Six.....	سته	يتيت	steet
Seven.....	سبعة	يبات	ibét
Small.....	صغير	قنون	ganoon
Sugar.....	سكر	سكار	askeer
Stirrups.....	ركابات	حلقات	halgāt
Spear.....	رصح	قنات	kanāt
Sword.....	سيف	شكي	shakee
Sky.....	فضا	هيتم	hétem
Sun.....	شمس	حيوم	héiom
Star.....	نجمة	كبكوب	kabkob
Scales (of fish).....	فلوس	صاف	saf
Snail.....	قوقع	حوكين	hokeen
Sap (of a tree).....	صمغ	حموة شرة	hamo sharah
Seed.....		حبيب	habbéb
Sand.....	رمل	بطح	batah
Stone.....	حجر	صور	saowar
Sulphur.....	كبريت	Id	Id
Starving.....	تزقف	شيلة	sheela
Sleep.....	نوم	شانات	shanat
Slumber, sleepy.....	نعلس	هندك	handak
Sorrow.....	غم	بوكي	bokee
Song.....	غنا	غنوي	ghanoe
Shivering.....	رجفة	يطوط	yataowat
Storm.....	ريح عاصب	البدات	alabadet

Sick.....	مريض	حبول الع	hamool ala
Straight (op. to crooked).....	سماح	سماح	sūmah
Scissars.....	مقص	مقراض	mogradth
Sails.....	شروتين	شروتين	sharōtan
Ship.....	مركب	مركب	markab
Silk.....	حرير	Id	Id
Stomach.....	معدة	كرش	karash
Silver.....	فضة	فطت	fadthat
Saddle.....	سرج	شد	shad
Standard (of an army).....	منحق	ذاربيت ذاعسكار	dtharabét askar
Steel (for striking light).....	زناد	قرا ت	Id
Slowly.....	هونا هين هون	خرو خرو	kharo kharo
Seer-fish.....	كناد	طرناك	tarnack
South wind S. W?.....	كوس	مديات	madeet
Seawind S. E?.....		بحري	bharee
Shaykh.....		دولت	dawalt
Slave.....		حوجور	hojoor
Safe.....	امان	مون	mōn
Spring (of water).....		مايون	maeeon
Stream or Brook.....		صرف	saraf
Stairs.....		مشعبات	mashabét

T.

Temper ill.....	سيرة شريفة	غيج فوصل	qāj fōsal
Temper good.....	جيد لصيغ	غيج مشرة	qāj mashree
Tin.....	قزير	رازيس	razees
Two.....	اثنين	ثروة	tharo
Ten.....	عشر	عشرية	ashareet
Town.....	بلد	رحبات	rhabét
Tree.....	شجرة	شجريت	shajareet
Thunder.....	راعد	اهد	had
Tongue.....	لسان	الشين	alsheen
Tooth.....	سن	مظورح	madthora
Thigh.....	فخذ	فامك	famak

Toes.....	اصبع الرجلين	شوبع	shōbah
Tomb	قبر	قبور	gōbar
To-day	اليوم	يامه	yamoh
Turtle.....		حمسيت	hamseet
Tail-fin (of fish)...	ذيل	ذنوب	dthanob
Trunk (tree).....	قرفة	مچندوت	majindōt
Thorn.....	شوك	شكا	shāka
Thirst.....	عطش	ظمون	thamōn
Talking	مخاطبه	غروي	gharooe
Thread	خيٲ	Id.....	khēt
Three.....	ثلاثة	شاظا ت	shāthét
Tower (round)	برج	درب	drab
Thus, so,.....	كذا	واطه او اطه	oatha oatha
They.....	هم	نهه	nahana
This, that.....	هذه ذاك	ذه ذاك	đtha đthak
There (place).....	هناك	حلوک	halōk
Track (of footstep).....		حض	hadth
Tears		دمات	damāt
Throat.....	زور رقية	قرد	garad
Thou.....	انت	هيت	hét
Tomorrow.....	بكرة	جهما	jahamma
Teat.....		واطب	wōtab
Tide flux and reflux.....		موشر	moshar
Tamarhind.....		صبور	sabor

V.

Victory	غلبه	مغلبيت	maghalbét
Vanquished.....	مقهور	قهري	kahree
Valley	وادي	خوٲر	khōtār
Voice.....	صوت	هرجات	harjat

U.

Udder.....		نايت	naeet
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W.

War.....	حرب	غورت	ghorat
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Wall.....	سور.....	درب.....	darab
Wine.....	خمر.....	خامر.....	khāmār
Wound.....	جرح.....	صوب.....	sōb
Water.....	ماء.....	حموة.....	hamoh
Wisdom.....	حكرم.....	عوقل.....	ōkal
Wife.....	امراة.....	حرمات.....	harmēt
Woman.....	امراة.....	حرمات.....	haramēt
White.....	ابيض.....	البون.....	allabōn
Wedding.....	خصبة.....	هاروس.....	haros
Well.....	يبر.....	Id.....	Id
World.....	دنيا.....	عرض.....	aradth
Wave.....	موج.....	موجت.....	mojat
Wind.....	ريح.....	رياح وكول.....	reah kol
Wolf.....	ذيب.....	كوب.....	kob
Whale.....	حوت.....	شوحات.....	shohēt
Wakefulness.....	ايقاض.....	تهيود.....	kaheod
Wet (damp).....		ثيري.....	théree
Wool.....	صوف.....	شف.....	shoof
Wood.....	حطب.....	ظرب.....	dtharab
Wing.....	جناح.....	Id.....	janāḥ
Weak.....	ضايف.....	هوين.....	howcen

Y.

Young.....	شاب.....	قنون.....	ganoon
Yellow.....	اصفر.....	اهظور.....	hadthor
Year.....	سنة.....	سنات.....	sanāt
You.....		هيت.....	hét
Yesterday.....	امس.....	يمشيه.....	yamsheeah
Yawn.....		فتروان.....	fatarooan

Verbs.

Come here.....	كالبو.....	kāl boh
Go there.....	سارا الحلوى.....	sar al halōk
Give me a little.....	هت شي.....	hat shee

Do not go there.....	تسيور لع	ta seeor la
Open the gate.....	فتاح بوب	fitaha bob
What is the matter.....	بوك هاشن	bok hēshān
What is your name.....	همك مون	hamak mon
Where are you travelling.....	نوكعك من هو	nokāk man loh
Good evening.....	بوة وتخفكم	boh watakhaḥ kom
I am a bout to go.....	احوم الهقر	ahom alhagar
I want to drink.....	احوم اتق	ahom athag
What do you want.....	تقوم هاشن	tahom hēshān
Where are you from.....	مسوفرا الهوة	masofar al hoh
Dress.....	البوس خلوق	alabos ktalōq
Never mind.....	يخلفا لع	yakhalf ala
Ask (something).....	عتير شه	atheer (sheea)
Hear.....	همع	hama
Strike.....	البدع	albadēe
Collect.....	جمع	jammā
Take hold of it.....	هثق	hothuk
Open.....	فتاح	fataha
Come back.....	ردد	radād
Eat.....	ته	tah
Come.....	نكاي	nakāee
Wait.....	سلوب	salob
Run.....	هواح	howah
Do.....	عمول	amol
Get up.....	عشيش	asheesh
Sit.....	ثوول	thowal
Call.....	سوق	soq
Take.....	هت	hat
Drink.....	تقي	tokee
Go.....	حرة	harah
Buy.....	شتوم	shatom
Ride.....	ركوب	rakob
Say.....	عتير	ghateer

Sneeze.....	عطشات	atishét
See.....	شئكس	shinks
Understand.....	غربك	gharbak
Laugh.....	يطحوك	yadthahok
Clean it.....	رحطه	rahadtha
Throw it away.....	ردة	ardah
Place it above.....	طرحه حقلًا	tarah haghala
He flies.....	يفرور	yafaroor
Vomit.	يقيوي	yakeewee
To taste (examine).....	طامة	tām

Sentences.

It is of no use.....	يجوزلح	yajoz la
Do.....	ينوفلح	yanofa la
Where are you going.....	الهيحوم	alho eehom
Man dead is put in the grave.....	غيج موت لهما الهال قوبر	qāj mot naham alhal gobar
The man said you struck me.....	غيج امورهت البودي	qāj amoor hat al bōdā- kee
And the other said I did not strike you.....	واذاك عهورهوا البود كهلح	o dtick amoor ho albo- dak ala
I want to swim.....	حوم السبح	hom al sabaha
Do not fear.....	افزك لح	fazakala
Who loves me I love him.....	هال ذيا جوبي اجوب به.....	hal dthe ajobbee ajo- bah
What you wish I wish.....	الحال تحوم هوا حوم	al hal tahom ho ahom
What are you doing.....	يبوة تعمل	yaboh tamol
In the house.....	بابيت	ba bet
All are good.....	كلهم جيد	koolhom jeeat
The people say.....	غثيركها بو	ghateer kahaboo
Vicinity of a well.....	شترير	ishthareer
In the house.....	برك بيت	barik bet
First day of the moon or month.....	هيوم ذا ورخ	hêom da warrakh

Good morning	صباحك	sabakah
The brain of the head.	دماغ ذحروة	damagh d heroh
A place where there is no water or people (desert)	قابه حموة الع وقع به هبوالع	kabee hamoo ala o kabee habo ala
I cannot do this.....	قود رالعله الع	kaodar alamalah la
Like a bird.....	غروي ذا الطير	gharo dtha târ
Take the money and give it to the Shaikh.....	ظوط دارهم و اذا مسن دوله	dthot dariam o azamsân dawalt
What news from the place? ...	شي خبر من مكان	she khabar min makan
What do you say?.....	يا به تغتوري	yâboh taghatoree
You say what?.....	تامور يا به	tamoor yâboh
He is dead or living?....	متوت والا حيوت	mâtoot walla hê'oot
Every thing is ready.....	كله نوجز	kalah nojas
The boat is going to load with dharah.....	سنبوق جهام يشلول عيش	sanbook jahan yashal al ysh
It tastes bad (dharah)....	طامة يغموم	tama yaghamon
It tastes good.....	طامة حجييد	tama hajeed
Look at the red clouds.	غلا عفور عوفر	ghalla afoor aufar
What does the Shaikh say?.....	ايه عمور دولت	eaboh tamoor daulat
Where do you live now?..	هوه تحلول لعصومه	hoh taholol asomah

An experienced eye, on carefully reading over the above vocabulary, will at once observe the nature of the inaccuracies in the Mahrah's Arabic spelling. For instance, the pronominal affix ك is frequently added to names of parts of the body or any thing directly relating to man ; ا, is also frequently substituted for the article ال, and often introduced when its vowel-sound would be sufficient &c. But these and other similar errors are of no great consequence, since they are easily detected, and cannot alter the radical spelling of the words, which are presented to the reader as the Mahrah wrote them. That the vocabulary therefore is perfect, I by no means wish to assert, but that so far as it goes, when the opportunity offered, an attempt to procure a little of the Mahrah language has not been wholly overlooked.

Remarks on the preceding Vocabulary, by the Secretary.

This vocabulary of Mahrah words, though limited and imperfect, is the first attempt to collect facts from which we may trace the affinities of the language, cognate with the primitive Syrian or *Aramæan*, the Hebrew, and the current dialect of Northern Arabia. M. Fresnel, in the *Journal of the Asiatic Society of Paris*,* has given the grammatical principles peculiar to the *Mahri*, but withholds in a great measure the Philological evidence of words on which he has founded his conclusions. The present may be the ground work however for further extended investigation into this interesting dialect of Southern Arabia, termed by the inhabitants themselves the *Ehkkili idiom*, and by the people of *Hejaz*, or Northern Arabia, the *Mahri*. It is more commonly known however to learned Arabs under the name of *Hamyari*, and becomes more peculiarly an object of curiosity, connected, as it is supposed to be, with the idiom of the Hamyaric Inscriptions, the decyphering and reading of which may be said to extend, at present, little beyond a knowledge of their alphabet; and which from some recent examples appears to have been written alternately from left to right, and from right to left, like the writing of the Greeks, called Βόσποροῦδος. The Geographer El-Edrisi, speaking of the *Curia Muria* islands, on the coast of Southern Arabia, says, "as to the islands of *Khartan* and *Martan*, of which we have already made mention, they are situated in the *Gulf of Herbs*, and are dependencies of the country of *Shajr*, where grows the Frankincense. They are in a flourishing state, inhabited by an Arab people, who dwell and live here, and who speak the language of the people of *Ad*, which is ancient and unknown to the Arabs of our day.†"—Masudi also somewhat earlier, in his "Meadows of Gold and Mines of Jewels," speaking of the country of *Shihr*, in Southern Arabia, says, "The inhabitants, who are of the tribe of *Kozaah-bin-Malik-bin-Hamyar*, and are called *Mahrah*, speak a language quite different from that of the Arabs; as they constantly use the letter *Shin* instead of *Kaf*.‡

* *Journal Asiatique*, troisieme serie, Tome VI. Decembre 1838, f: 529.

† *Geographie D'Edrisi* traduite de l'Arabe en Francais par M: P: Amedee Jaubert, Tome Premier f: 48.

‡ Masudi under the section of his work, giving an account of the different seas, and the nations on their shores.

The Southern Arabs establish a distinction between the dialect of the *Garas* and that of the *Mahras*, asserting that the former contains a much less proportion of modern Arabic than the latter; so that an inhabitant of the coast of *Shihr* شحر, who knew no other Arabic than that of his own proper dialect, would be unable to comprehend the language of the people of *Shajr* شجر, who are the *Garas* occupying the Sabhan mountains and the coast from Cape *Shajr S. W.* to *Marbat* and *Hasek N. E.* These dialects of the two tribes are but idioms however of the same language, in which are found many Hebrew words not met with in Arabic; and both are perhaps, as Fresnel supposes, the elder sisters of the former. The proper appellation of the original idiom among the *Garas* is the *Ehkkili*, spoken at *Marbat* and *Zafar*, and throughout the district of *Shajr*: the Geographical limits of which, as we shall immediately notice, have been confounded with those of *Shihr*, or the maritime part of *Hazramaut*, chiefly occupied by *Mahras*, descended as would appear from the more ancient and original tribe of *Garas*.

It is principally in the country of *Shihr* that those Hamyaric Inscriptions are to be found, which were first brought to light by Officers of the Indian Navy, and which have latterly attracted so much learned attention from those cultivating a knowledge of the Semitic languages. A now desolate Fort on the sea shore,* in lat : 14° 38' 30," N. Longitude 49° 27' 35" E. seems to have given name to this tract of country, which corresponds as nearly as may be with the maritime part of *Hazramaut*; and is distinguished from that of *Shajr, N. E.* called after the Cape of this name, situated between *Ras-Fartak* and *Marbat*. The latter is called by *Abulfeda Sowahil Zafar*, or the coast of *Zafar*, or *Dhafar*, an ancient city of this quarter, of which the ruins are now called *El-Balad*, or the town *par-excellence*. It has been frequently confounded with the inland town of the same name† belonging to the *Sapphoritæ*,

* *Abulfeda*, in the preface to the *Takwim-al-Baldan*, says that between *Shihr* and *Hazramaut* is only a distance of four days.

† *Monsieur Fresnel*, in his fourth letter on the history of the Arabs previous to the period of Islamism, *Journal Asiatique Juin 1838*, maintains that the ruined town, now called *El-Balad*, on the coast of *Marbat*, is the ancient *Zafar*, which was the capital of the Hamyaric Kings; but in this opinion he is certainly in error, as the *Sephar* of *Genesis*, is in the territory of *Jahsseb*, a

but which has been satisfactorily identified by Niebuhr with a site, where are some Hamyaric Inscriptions, about two and half German miles *S: S: E:* of Jerim, in lat : $14^{\circ} 17'$.—This identification places the original seats of the *Homeritæ*, or tribe of Hamyar, much further to the westward than the maritime district of *Shihr*, where those Inscriptions have hitherto been chiefly found ; and would lead to the inference that the maritime *Zafar*, was the capital of the *Ascitæ*, mentioned both by Ptolemy and Pliny, as situated in the neighbourhood of the sea near *Cape Syagros*, which corresponds with Ras-Shajr. The *Ascitæ* may have been named from being situated on the *Jun-al-Hashish*, or the Gulf-of-herbs, which is the Arabic name for the Bay in which *Khartan* and *Martan* lie ; and though we cannot venture to assert that the name was only another appellation for the *Gerræ*, a poor people who originally fled from Chaldea to Arabia,* there is strong presumptive evidence that the modern *Garas*, whose language has so many affinities common with the Syriac and Hebrew, are descendants and remains of this ancient colony.—The most remarkable of these affinities can be best shewn in the following table, in which the Mahra dialect, is compared with that of Socotra, an undoubted derivative of the Ghiz or Ethiopic.

The two districts of *Shihr* and *Shajr* are but the maritime boundaries of the country properly known, by the name of *Mahra*, which is an extensive central desert, composed chiefly of moveable sands, interspersed with hilly tracts.—The length and breadth of this dry and barren

district of Arabia between the Red Sea and Sanaa, and not on the Indian ocean, as must be assumed by Monsieur Fresnel's identification. It is true that Abulfeda and Masudi only make mention of the *maritime Zafar* ; but the absence of their testimony to their being a more ancient and inland town of the same name is no decided negative to the faithfulness of Niebuhr's identification, which is thus confirmed by the words of Edrisis' Geography—"Dhofar is the capital district of Jahsseb. It was formerly one of the most considerable and celebrated villages. The Kings of Yeman had here their residence, and here is to be seen the palace of Zeidan. These buildings are now in ruins and the population much reduced. The inhabitants have however preserved some remains of their ancient wealth, and possess cultivated fields and date trees in sufficient number for the supply of their wants." A very full account of the ruins and present state of El-Balad, or the maritime Zafar near Marbat, by Dr. Carter, has been published in the Transactions of the Bombay Geographical Society for 1844.

* Strabo, Book XVI, page 766.

waste, has never been accurately ascertained either in ancient or modern times, though the Arab Geographers tell us that it is nearly nine hundred miles in length, and from fifteen to twenty-five miles in breadth.— Its greatest extent would appear to lie from the eastern portion of Arabia, near Ras-al-Had, to the mountain districts in the neighbourhood of Mekka. The following is the account of it by *Edrisi*: “The country of *Shajr*, inhabited by the Arabs of *Mahra*, who are of an unmixed race, adjoins that of *Hazramaut*. The camels which are produced here are unequalled for swiftness. It is reported also that with very little care they can be brought to understand whatever you wish them. They have names given them by which they are called; and they come to tender their obedience without hesitation. The principal fort of *Mahra* is *Shajr*. The language of the inhabitants is so corrupted that it is difficult to understand them; it is the ancient *Hamyaric*. This country is very poor. The only resources of the inhabitants consist in the transport of merchandise, and in the traffick of goats and camels. They feed their cattle on a species of fish known under the name of *wark*, which is caught in the sea of Oman, and which they give to their cattle after exposing it to dry in the sun. The people of *Mahra* are unacquainted with either corn or bread. They live on fish, dates, and milk, and drink but little water; they are so accustomed to this diet, that when they go into the neighbouring countries, and have to eat either bread or farinaceous food, they are made uncomfortable, and are sometimes seriously ill. It is said that the whole length of the country of *Mahra* is 900 miles, and its breadth from 15 to 25 miles. It is composed entirely of moveable sands; and from the extremity of the country of *Shajr* to *Aden* is reckoned a distance of 300 miles.”* Baron Wrede during an excursion in *Hazramaut* reached the borders of this desert after a 6 hours’ journey to the N. W. from *Sava* in the Wadi Rachie. He describes it as an immense sandy plain, strewed with numberless undulating hills, which give it the appearance of a moving sea, without a single trace of vegetation to animate the vast expanse. †

* Recueil de voyages et de memoires publié par la Société de Géographie, de Paris, Tome cinquieme feuillet 150.

† Baron Wrede’s excursion in *Hazramaut*, in the Journal of the Royal Geographical Society, vol: XIV p: 110.

The following are a few of the Mahri words compared with Socotran and Hebrew.

English.	Mahari.	Socotran.	Hebrew or Chaldee.
Back	Dhara mothan	..tadah	..jaoi
Belly	..djof		..jofah
Cow	..bakarét		..bakar
Donkey	..heir		..zaher
Eyebrow	..ahajor	..haj-har	..jaboth
Fire	..sheewot	..sheiwat	..eshūata
Father	..heb		..ab
Four	..robot		..raba
Fish	..seit	..sodah	
Frog	..dthafzāt		..zafreda
God or Master	..balee		..baal
Hair	..shof	..shif	
Here	..boh		..pah
Ibex	..waal		..ael
Knee	..barak		..berek
Lofty	..rahak		..rahak
Lizard	..dthob		..zab
Milk	..ishakhof	..huf	
Month	..warakh		..yerah
Moon	..wareet		..yerah
Net (cart)	..maghweer		..mager
Nose	..nakhrir	..nahir	..af
Nine	..iset	..saah	..thisath
Red	..aufar	..aufir	
Rice	..hiraz	..arhaz	
Rope	..keiood	..ket	
Six	..yiteet	..yitah	
Sword	..shakee	..ashko	
Sun	..heiom	..shohum	
Stars	..kabkob	..kokab	
Two	..tharo	..tarawa	
Ten	..ashareet		..ashareth
White	..allabōn	..lebhema	..laban

Before the Koran had fixed the Koraish dialect of the Arabic language, the several vernacular idioms spoken in the Arabian peninsula, and in the plains between Syria and Mesopotamia, were indiscriminately used

in the earliest verses of Arabic poetry, called *rajaz*; which, from the variety of words and expressions they contain, were the favorite objects of study among the Arabic philologists and grammarians. Of these dialects the Hamyaric, spoken by the descendants of Kahtan, is considered generally to have approached nearer the purity of the *Aramæan* than the dialect of the Koraish; and the great number of Hebrew formations and words found in the *Mahri*, seems to support the truth of this opinion. It is also confirmed by Masudi, who makes Kahtan, or Joctan, to be descended from *Arfakhshad* and to speak *Suryani*; and states that *Yarub*, the son of Kahtan spoke another language that differed from the Syriac, and was as some think the Hamyaric dialect of Arabic; of which we must consider the *Garawi* and the *Mahri* to be remains, corrupted indeed by an admixture of Indian and even Greek words; which, if not borrowed directly from their original countries, were obtained from the inhabitants of Dioscoridis, or Socotra, whose inhabitants were in the time of Arrian's *Periplus** a mixed race of Arabs, Indians, and Greeks.

One can scarcely fail to notice the similarity of the Mahri *qjbak*, (love) and the Greek term *αγαπη* though the former be disguised by the additional *k* which is the pronominal Arabic affix of the second person; nor can we be deceived in concluding that *عفور* *asoor*, from *अभ्र* *abhr* a cloud, and *منعشى* *maanash* the Arabic noun of place, formed from *नश* *nash* (annihilation), are evident Sanskrit derivatives. The Mahri terms for *heaven* and *hell* are also of Indian origin; the Arabic *dthal*, or Sanskrit *स्थल* *sthal*, (place) when compounded with the article *al* and *kheir*, (goodness) being the appellation for heaven, or the place of the good; while *dthal-al sheeot*, signifying the place of fire, stands as the denomination for hell. But we shall not now pursue these interesting affinities of Mahri, which would require for their complete elucidation a more extensive vocabulary of the dialect than the one now given, and more ample illustrations of the grammatical principles common to this language, the Syriac, and the Hebrew, by one intimately acquainted with these three. There is enough, however, to excite interest and encourage further research.

J. B.

* Arriani Periplus Maris Erythraei in editione Geographiae veteris, Oxoniæ vol: I f: 17.

ॐ नमो भगवते
स्वामीने नमः

THE GRANT.

ॐ नमो भगवते
स्वामीने नमः

Fac-Simile of the Samangarh Copper-Plate Grant.

ॐ नमो भगवते
स्वामीने नमः

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ॐ नमो भगवते वासुदेवाय
ॐ नमो भगवते वासुदेवाय

PLATE GRANT.

ॐ नमो भगवते वासुदेवाय
ॐ नमो भगवते वासुदेवाय

SMILE OF THE SAMANGARH COPPER - PLATE GRANT.

गन्धर्वराजोवासाय नमः पृथिवीमहेश्वर्यै नमः
ॐ नमो भगवते वासुदेवाय

मा पद्ये भूषि श्रादिदि रगाद्युस र द म द सा
 स म वि कु दग के न य कौ ल गृदि स टि ना ट कः ॥
 र भूय स श्रु कु घ्नतः क षोप य न श्रु ता न के न वि त्प वि प
 क रै रू ना प ना ग्रा से न। सु द ल प न द नं वा या क न ल व
 य से स ट मा लि वि श्रा या स य त कृ मि ॥ यः स
 र दि ल प्ता स दि षा य श्रु पीः (य स्र द्या य म क कु मि
 श्रु क। सु प ष। नं क दु ण क ग द्दु पृ द्द स टि तः मी र
 प्री क रं दि वि तं स द्द क त य षः पा द्द ग नं सा स म।

ARTICLE II.—*A Sanskrit Copper Plate Inscription, found in the Fort of Samangarh, in the Kolapur country, dated Shaka 675 (753 A. D.) and translated into English.*
By the late Ball Gungadhur Shastree.

May he (Vishnu), whose lotus-navel Brahma has made his seat, preserve you, as well as Hara (Shiva), whose head is adorned by a handsome phase of the moon. There lived a virtuous king, named *Govind Raja*, who, being always foremost in battle, and destroying his enemies with his uplifted sword, as the sun's orb removes the darkness prevailing in the night, became known by the title of the lion of kings, in the remotest quarters of the earth. Whenever he perceived an army in front, he biting his lips, and with eye-brows bent up, loudly laughed (at his enemies) in battle, relying upon his scimitar, (the nobility of) his family, his heart, and his spirit. No sooner he lifted up his scimitar, or even his name was mentioned, than grace, honour, and spirit, unseasonably departed from his enemies and at once. His son, *Kaka Raja*, shone in the family like a gem; supporting, like Hari (Vishnu), a high character for relieving the distresses of the oppressed, and returning evil for evil, though grateful for the favours he received from others. While he was ruling over the earth, the tame peacocks cackled every evening for joy, mistaking for clouds the summits of palaces, smutted by the volumes of smoke proceeding from the sacrifices of the twice-born. These pacific Bráhmans, in the practice of their devotions, sprinkled so much sacred water that people had to pass through ankle-deep liquid. To him was born a son, named *Indra Raja*, the region of whose shoulders was scratched by contact with the teeth of elephants, whose gaping temples emitted a copious stream of temporal juice. He supported Rástra Kútā, as the golden mountain (supports the earth), and protected the world, destroying all his enemies. His queen who, like moon-light, complying with the desires (of supplicants) and removing the gloom (of poverty), was descended on her mother's side from the lunar race, and on her father's side from the Shalukya (Chalukya) race, in respect to the affording of protection and maintenance without reference to the service performed by the people, she attained an exalted rank among the ornaments of her sex. The good king *Indra Raja* had by her a virtuous son, as a recompense

for the protection afforded by him to this earth. The world being deprived of the splendour of *Indra Raja's* glory, *Shri Danti Durga Raja* assumed the functions of the sun to his lotus-like family. The elephants of his enemies, terrified in battle, as at the sight of a lion; fled away, pulling up their picketing-posts by the roots; and no body knew what became of them. The turreted castles of his enemies fell with their spirits, unable to bear the heat of his prowess and his wrath. Men perceived with astonishment the demolition of the steep banks of the great river Rêva (Narbudda), effected by his victorious elephants. His filial affection was demonstrated in the grants of land made by his mother in four hundred thousand villages. He obtained the title of the king of kings and great lord (of the earth), by subduing Vallabha without any effort, such as that of wielding weapons and sending armies, but merely by the torsion of his brow. He defeated with a few of his followers the whole army of the Karnataka, which had been renowned for the humiliation of Sriharsha, the king of Kanchi, Kerala, Chola, and Pandya. This *Danti Durga Raja*, the lord of the earth, &c. commands all provincial and district chiefs, and heads of villages in their respective capacities, to take notice as follows:

In the Shaka year 675 corresponding to Samvat 811,* on the 7th of Magha, called Ratha Saptami, we, being desirous of securing virtue and fame to our parents and ourselves, have granted, by formally pouring water, the village of Deulvat, situated in the district of Koppar, to Narayan Bhatta, of Vasishtha Gotra, inhabitant of Karahataka, the grandson of Trivikram Bhatta, and the son of Krishna Bhatta, eminently skilled in the Vedas and their subdivisions. This small gift of land is made for the promotion of the Agnihotra and other sacrifices. It is not to be entered into by the military and other officers of Government, or by any evil-disposed persons; but should always be protected and relieved from oppression by all future kings, whether belonging to the family or not. To the east of the said village lies new Tyalavalhi; to the south Paragopagrama, belonging to the Brahmans; to the west, Higgur-vade; and to the south, Artavatagrama. The village, bounded as above, has been given away altogether with all its revenues, arising from vegetables or minerals, or from fines, taxes, and other sources. May it receive invariable protection while being cultivated by the Brahman himself, or by others for his use and profit. As said by Bhagwan Vyas, he who

* The mention of these two dates is not uncommon in the grants of Southern India, according to Mr. Walter Elliott. See R. Asiatic Society's Journal. No. VIII 1837 p. 2.

resumes a grant of land, made either by himself or by another, becomes a worm in filth for sixty thousand years. This mandate, illustrating the great fame of *Danti Durga*, has been written under the order of that monarch, presiding in the assembly of great kings, by Indra, who, not elated by prosperity, was always willing to do the great duty of conferring obligations upon others and of promoting their advantage.

Remarks by the Translator.

The Rāja, whose grant is commemorated in the preceding Inscription, is mentioned in the 1st line of the 2nd Plate, as one of the sovereigns of Rāshtra Kūta; with whose name, as a separate and important family, we first became acquainted on the publication of the Karda or Kardla and Van-Dindori grants in the Royal Asiatic Society's Journal, and on whose history some further light has recently been thrown by the Kharepātan grant, which the Bombay Branch of the Royal Asiatic Society did me the honour to publish, in the Vth No. of its Journal.* The Van-Dindori grant, which is the oldest of these three, is dated Shaka year 730 (A. D. 808); but the other two, being richer in giving the genealogy of their heroes, begin with Danti Durga, the predecessor of Krishna Rāja, whose name is the first mentioned in the Van-Dindori grant, and who, according to that authority, wrested the sovereign power, for a time, from the hands of the Chālukyas. The present Inscription being 55 years older than this last named grant, supplies the date of Danti Durga's reign, which is 675 Shaka year (A. D. 753). As I have shewn on a former occasion how the three abovementioned grants confirm one another in their most important points, I shall only remark in this place, that the present copper plate is not an unimportant addition to the series of documents, which have already been discovered in relation to the Yādavas of Rāshtra Kūta. In addition to Danti Durga's date, it furnishes us with the names of three of his predecessors; viz. *Indra Raja*, *Kaka Raja*, and *Govind Raja*, the last of whom must have reigned towards the end of the 7th century of Christ, taking 25 years as the ordinary average duration of each reign.

The character † in which the Plates are engraved, does not differ

* See. Nos. V. and X.

† The following well known letters, belonging to the ancient cave Alphabet, may be noticed in the accompanying inscription, अ for इ; Δ for ए; ॢ for ऋ; ॣ for ॠ; ॡ for ऋ; ॢ for ॠ; ॣ for ऋ; । for ॠ; ॥ for ॡ and ॢ for ॣ. The vowel marks for अ, आ, उ and ए, like the letters क, न and some others appear as well in the cave form, as in their more modern shape. The symbols for ञ, ण, त, ड, ढ, ध, ढ, न, य, स, ह and ञ are evidently in a state of transition.

much from that assigned by Mr. Prinsep to the 8th century of the Christian era; and from a note of Mr. Wathen's at the end of the Van Dindori Inscription, the resemblance between it and the modern Deva Nagari is not less striking.—The Cave character may have been in use in almost all its purity, as supposed by some, at the period under consideration; but from the evidence of the Valabhi plates* dated 328 A. D. and a mass of other Inscriptions, it is very certain that a modification of it was introduced into many parts of the Dekhan at a very remote period.

As Mr. Walter Elliott has not found any record of this family in the numerous collections which he made to the south of the Krishna, it is probable that its power never extended much beyond that river, notwithstanding the defeat of the Karnataka forces mentioned in the accompanying Inscription, and the excursions beyond the Tungabhadra adverted to in the Van Dindori grant. More extensive conquests were made by the Yādavas of Rāshtra Kūta towards Marwād and the Vindhya mountains. The Rāshtra Kūta family may hereafter be found to have some connexion with the Rattas, so frequently spoken of in the History of Rājasthan.

From the absence of the classical surname (the Yādavas) of this family, both in the accompanying and the Van-Dindori grant, we may suppose that it was not assumed by those who laid the foundation of its greatness. That the power of the Rāshtra Kūta family was in its infancy, in the days of Danti Durga, may also, to a certain extent, be inferred from the language of the accompanying grant, which is not only extremely simple but incorrect and unidiomatic in many places; showing that his Court was not yet adorned by poets or engravers of any eminence.

The seal obviously bears Shiva's image with a crescent and a snake.

The only other circumstance worthy of notice is the descent of Danti Durga's mother from the family of the Chālukyas, the opponents of the kings of Rāshtra Kūta.

The Brahman to whom the grant is made, is said to be an inhabitant of Karhātaka, (Karada or Kurar,) on the banks of the Krishna. The village assigned to him, as well as those places referred to as its boundaries, are all to be found in the neighbourhood of Kolapur; but I am not able just now to ascertain the precise locality of the gift. †

4th May 1846.

BALL G. SHASTREE.

* Bengal Asiatic Society's Journal for September, 1835.

† The Copper-plate grants belonging to this family, and their predecessors the Chālukyas, are of much interest and importance in their relation to the history of the Jaina religion.—*Jina Sena Acharya*, the author of the Jaina Puranas, is said to have been the Guru, or spiritual preceptor of *Amoghavarsa*, a Jain prince, of the Arcot district in the end of the ninth century, (*Wilson's Mackenzie Collection Vol. I pre. p. xxvii*) who appears to be the same as the *Amoghavarsa* II of the Kharepatan grant, published in our Journal Vol. I p. 209.—*Editor*.

Transcript of the Plate in Modern Devanagari.

स्वस्ति सवोऽथाद्वेषसाधामयन्नाभिकमलंकृतं । हरभयस्य कात्तेन्दुकलया
कमलंकृतं ॥ आसीद्विषत्तिमिरमुद्यतमण्डलाग्रो ध्वस्तीस्तिभयन्नभिमु
खोरणशर्वरीषु । भूयः शुचिर्विजयितासदिगन्तकीर्तिगोविन्दराज इति
राजसुराजसिंहः ॥ दृष्ट्वा च मूमभिमुखं सिम्भटादृहा समुन्नामितं सपदि
येन रणेषु नित्यं । दष्टाधरेण दधता भृकुटीललाटे खड्गकुलं च हृदयं च
निजं च सत्त्वं ॥ खड्गकराप्रश्रयतश्च शोभामानो मनस्तत्सममेव यस्य । म
हाहवेनामनिशम्य सद्यस्त्रयं रिपूणां विगलस्य काण्डे ॥ तस्यात्मजो जा
गृतदीर्घकीर्तिरार्त्तार्त्तहारि हरि विश्रुतभामधारी । भूयः सृतिष्व
पकृतानुकृतिः कतज्ञः श्रीकक्कराज इति गोत्रमणिर्बभूव ॥ यमिन्द्रशास
तिमहीन्नरपो द्विजानां वैतानधूमनिवहैः परिकर्पराणि । संध्यासु सौधशिख
राणि विलोक्य केकाः कुर्वन्ति वश्मशिखिनो जलदागमोक्ताः ॥ यस्य द्विजा
जनाः शांताः शांतिवाचनवरीणा । प्रसहगुल्फदधेन जनश्वरतिमंदि
रे ॥ तस्य प्रभिन्नकरटच्युतदानदन्तिदन्तप्रहाररुचिरे लिखिता
सपीठः । क्षमापः क्षितौ क्षपितशत्रुरभूत्तनूजः सद्राष्ट्रकूटकनकाद्विरिवेन्द्रराजः ।
पूरिताशा शुचिर्ध्वस्तावृत्तिर्ज्योत्स्नेवमातृतः । राजा सोमान्वयीतस्य पितृतश्च-
शलुक्यजा ॥

श्रीमद्युक्तिगणानां साध्वीनामापनापदं । रक्षणे भरणे लोकपारिचारनिरापदं ।
सनयंतनयंतस्यासले भेभृदुत्तमः । नीतावेवेमिवाशेषजगतः पालितायति ॥
ध्वस्ततेजसिधामो घप्रक्ष्वेलितदिगन्तरे । श्रीदन्तिदुर्गाराजस्य स्वकुलभोज
भास्करः ॥

यस्याजौ राजा सिंहस्य विव्रस्तवैरिवारणाः । सलज्जास्तंभमुन्मूल्य ज्ञायंते-
क्वापिनो गताः

॥ सादृशकानि दुर्गाणि हृदयैः सह विद्विषां । पतन्ति यत्प्रतापोयक्रोपां
कुरसमुद्रकैः ॥ महीमहानदीरेवारो धोभित्तिविदारणं । लोका विलोक्य
न्युच्चैः कृतं यज्जयकुंजरैः ॥ मातृभक्तिः प्रतिग्रामं ग्रामलक्षचतुष्टये । ददत्या
भूप्रदानानियस्य मात्राप्रकाशिता ॥ सभूविभेदमगृहीतविधौ तश्च मन्नात
मप्रणिहितां नमपेतयन्नात् ॥ यो बलभंसपदिदंडलकेनाजित्वा राजाधिरा
जरमेश्वरतामुपैति ॥ कांचीशकेरलनराधिपचोलपांड्यश्रीहर्षवज्रटवि

भेदविधानदक्षं । कर्णाटकं बलमनंतमजे परमैर्भृत्यैः क्रियद्विरपियः
 सहस्राजिगाय । सचपृथिवीवल्लभमहाराजाधिराजपरमेश्वरपरम
 भट्टारकखड्गधारार्कश्रदिंतिदुर्गाराजदेवः सर्वानेवराष्ट्रपतिविष
 यपतिग्रामकूटांयथार्हप्रतिपत्याज्ञापयत्यस्तुवः संविदितं यथा
 पंचसप्तत्यधिकशककालसंवत्सरशतषट्ककेव्यतीते संवत् ८११ पोह
 रिकायां माघमाससप्तम्यां तुलापुरुषस्थिते मातापित्रोरा
 त्मनश्च पुण्ययशोभिवृद्धये कोप्परपंचशतभुक्तयन्तर्गतकरं
 दिपदे जफितदे उल्लाटनामग्रामः करहाटकवास्तव्यः बह्वचस
 ब्रह्मधारिणे वसिष्ठगोत्राय भट्टत्रिविक्रमपौत्राय कृष्णभट्टपुत्रनाराय
 णभट्टाय वेदे वेदांगपारगाय अभिहोत्रबलिचरुप्रवर्तननिमित्तं
 भूयच्छिद्रन्यायेन उदकपूर्वोदत्तः स चाचाटभट्टप्रवेश्यः भ
 सन्नरप्रवृत्तिविनिवृत्ताचारः सर्वावाधापरिहारेणास्मद्वंश्यै
 रन्यैर्वा प्रतिपालनीयो नृपतिभिः यस्य च पूर्वतः न वा स लेव
 ल्हीग्रामः दक्षिणतः पारगोवा ब्राह्मणग्रामः पश्चिमतः हिगुर्वाडें
 ग्रामः उत्तरतः अइतवाटग्रामः एवं चतुराघाटलक्षितो ग्रामः सवृ
 क्षमूलकुलस्वसीमापर्यंतसिन्ध्यादिहिरण्यायः सदंडदोषदसा
 पराधयथासमवित्तभागभागकरतर्वात्पत्यादिसहितोदत्तः
 अस्मभुंजतभुंजनाय तस्य कृषतः कर्षापयतस्य धारकेन चित्परिर
 क्षनाकार्या ॥ उक्तभगवत्ताव्यासेन स्वदत्तां परदत्तां वा यो हरेत व
 सुंधरां । षष्टिवर्षसहस्राणि विष्टायां जायते कृमिः ॥ यः सं
 पद्भिर्नुसृत्यतः परहितव्यासंगिनो नीयस्वधीः । यस्तत्राप्युपकर्तुमि
 च्छति महर्षमस्य काष्ठाधने । तेनेन्द्रेण नरेन्द्रवृन्दसहितश्रीद
 न्तिवर्माज्ञया प्रीत्येदं लिखितं तदुन्नतयज्ञः प्रोद्गासनं शासनं ॥



ARTICLE III.—*Some remarks on specimens of Saurarāshtra Coins, lately found at the village of Shirawl, near Junér.*

By the Rev. John Stevenson D. D.

To H. J. Carter, Esq.

Officiating Secretary of the Asiatic Society.

MY DEAR SIR,—At Dr. Bird's desire I have the pleasure of sending you the accompanying specimens of the coins of the Regal Satraps of Saurarāshtra, found near Junér in August last to the number of 400, that you may have fac-similes of them taken for the Journal of the Society. I shall number them according to Mr. Prinsep's system, not disturbing his figures, but by the sign +, shewing which of the names in his list the one in question should, I suppose, precede.

The most ancient of our coins, I mark + 1, as it is a new one, and precedes I conceive the whole of Mr. Prinsep's series.* It bears the following legend on the obverse:

Rājna Mahakshatrapasa Ismaradattasa [Bala] Putrasa.

The letters in this legend are well formed, and all very distinct except the two corresponding to the word put in brackets, and of which there may be some doubt. There is no doubt however of the name of the father occupying this place, and that he was a mere private individual. There are rudiments of a date and of Greek letters, as is usual in these coins, circling a bold and well executed head, but all too indistinct to furnish any clue to their import. It would seem that this sovereign had been commissioned to exercise a delegated royalty in Western India, but did not transmit his authority to any one of his family, as none of his descendants appear in the list of Royal Satraps.

I. The next is number 1 of Prinsep's list.

The legend on the obverse is,

Rājna Kshatra[putra Rudra] Sahasa Swami Jina Dāma Putrasa.

The name indeed of the Raja is blotted out, but that of the father in this instance is sufficient to mark it out as the coin in question. The remarkable thing in this coin however is, the distinctness of the Greek let-

* No 3 of Plate xxiv.

ters around the face, and which as nearly as I can transcribe them are as follows :

ΔΙΟΛΥΠΙΣΙΙΙ. The first eight of these letters, I read ΔΙΟΛΥΠΙΣ. The last with the two fragments I suppose belong to a new word, of which too little remains to found any conjecture upon. If I am right in reference to the first word, it will be a tolerable translation into Greek of *Rudra*, or even of *Rudra Saha*, supposing *Dio* as in Dionysius &c. to be the name of Jupiter, and the other element meaning, like *Rudra*, the causer of grief.

2. The legend on the obverse of this coin, belonging to No 2 of Prinsep's sovereigns, is entire and as follows :

Rājna Kshatrapasa Aga Dāmna Rājna Kshatrapasa Rudra Saha Putrasa.

This sovereign was the son of the preceding. It is remarkable in his coins that the execution is altogether inferior to the preceding, and to one or two that follow in the series. There are rudiments of a date just behind the head, but none of Greek letters.

4. The fourth coin in our collection is that of *Vijaya*. Of his father *Dāma Saha*, no coins have yet been found. The legend on this coin is not very distinct in some places, but enough of it remains to remove all doubt. It is,

Rājna Maha Kshatrapasa Vijaya Sahasa Rājna Maha Kshatrapasa Dāma Saha Putrasa.

Behind the head, the following old numerals are to be read ३१५ which probably mean 314.

+ 5. This is a new coin. Besides the silver coin accompanying, I have a bronze one of the same monarch on which the name is quite distinct, though the father's is obliterated. On this coin the name is obscure in the letters ΧΕ [मज]. The legend is,

Rājna Kshatrapasa Dāmajatasriyah Rājna Maha Kshatrapasa Dama Saha Putrasa.

The name is thus written ΧΧΕΙΖΩ: and in the Nominative case will be,

Dāmujāta Srih.

Of Prinsep's No 5, no coins are in my possession.

6. Is a coin of the great

Rudra Saha.

The legend is

*Rājna Mahakshatrapasa Rudra Sahasa Rājna Mahakshatrapasa
Vira Dāmna Putrasa.*

Behind the head are the numbers ३८३ which without much doubt mean 381; or if not, 385.

7. This coin was struck by a brother of the last named sovereign. The legend is partly defaced, but enough remains to identify it. It is

*Rājna Kshatrapasa Visva [Sahasa Rājna Maha Kshatrapasa Vira]
Dāmna Putrasa.*

+ 8. This is also a new coin. The legend of which is

*Rājna Kshatrapasa Visva Sahasa Rājna Maha Kshatrapasa Rudra
Saha Putrasa.*

This sovereign was therefore a nephew of the last mentioned king, and brother to No. + 8 of Mr. Prinsep's list. The letters are very distinct, and this sovereign is not to be confounded with his predecessor or successor of the same name.

9. I take this to be a coin of Mr. Prinsep's *Atri Dāma*: the reading on our coin however is clearly *Bhatri Dāma*, and Mr. Prinsep mentions this name as that of the father of the next in the series at p. 355 of the Asiatic Journal vol. VII. The two letters अ and ए are so like that they might easily have been confounded. The inscription is

*Rājna Maha Kshatrapasa Bhatri Dāmna Rājna Maha Kshatrapasa
Rudra Saha Putrasa.*

10. This is the last coin in our series, and has inscribed on it

[*Rājna Maha Kshatrapasa*] *Visva Sahasa Rājna Maha Kshatrapasa Bhatri Dāmna Putrasa.*

No coin of a later date than this last has been found at Junir, and most likely the collection of coins was made in the reign of this monarch. The principal historic fact of interest brought to light by this discovery is, that the country as far as Junir was governed by rulers, who were either at that time dependent on or had previously owned allegiance to the Grecian monarchs of Bactria; as we could not otherwise account for the current money of the realm bearing an inscription in Greek letters. The subjection, however, may in later times have been merely nominal. I think also we are quite warranted to infer that the art of coining metal was borrowed from the Greeks. The oldest coins, when we may suppose the Grecian connection to have been the closest, are well executed, and the more modern are of a much inferior type. The art of coining decayed with the decay of the Grecian connection. Let patriotic Hindus consider the lesson such a fact teaches.

I remain, Dear Sir, yours very faithfully,

Bombay, 10th March, 1847.

J. STEVENSON.

ARTICLE IV.—*A description of the Frankincense Tree of Arabia, with remarks on the Misplacement of the "Libanophorous Region" in Ptolemy's Geography.* By Assistant Surgeon H. J. Carter, Bombay Establishment.

There is something peculiarly interesting in the history of the "Frankincense Tree," from the frequent allusions made to it in the Holy Scriptures. From the earliest periods of the Jewish history, its produce has formed one of the ingredients in their offerings of incense, and it still forms the "sweet perfume" of our catholic churches at the present day.

Whether we consider the description of the Arabian Frankincense Tree in a botanical or in a geographical point of view, both are alike interesting, for the tree, though described, has I believe never been identified, and the exact limits of that part of Arabia to which it is indigenous, viz. the *Libanophorous Region* of Ptolemy, have never been clearly defined.

They were subjects of much interest to the ancients, but sought after with little success; even Kings may be enumerated among others, who have personally engaged themselves in endeavouring to obtain a faithful description of the Frankincense Tree, and in discovering that part of the peninsula of Arabia, to which it is exclusively indigenous. Antigonus had a branch of it purposely brought to him for his inspection; * the Ptolemies planted it in Egypt, and are said to have watched it with the greatest care; † King Juba wrote an account of it to C. Cæsar, the adopted son of Augustus; ‡ and the latter sent Ælius Gallus to Arabia, at the head of an army consisting of ten thousand Romans, besides Jews and Nabatæans, there to discover "after the country of gold, that of the frankincense tree." This even did not succeed, for when Ælius Gallus was within two days march of the Frankincense region, his army became so distressed for want of water, that he was compelled to abandon his pursuit, and to make as sudden and hasty a retreat, as his advance appears to have been slow and deliberate.§

Theophrastus, after relating all he had collected on the subject, which is wonderfully correct so far as it goes, concludes by saying, "up to this time this is all we have learnt of it," meaning the Frankincense Tree.||

Pliny, in the following extract from the quaint but faithful translation of Dr Holland, writes, "we have waged war in Arabia, and our Roman army have entered a great way into that country. C. Cæsar, the adopted son of Augustus, won great honour and glory from thence; and yet verily to my knowledge there was never any Latin Author that hath put down in writing the form and fashion of the tree that beareth incense.¶" From Pliny downwards, the subject appears to have excited less interest, and to have been almost wholly lost sight of, until the Danish Expedition to Arabia took place, when one of the "questions proposed by Michaelis to Niebuhr," was, "to determine the site and description of the Frankincense Tree."** It was however unanswered, for Niebuhr writes, "We could learn nothing of the tree from which incense distils, and Mr Forskael does not mention it."††

* Theophrast. Hist. Plant. L. ix. c. iv. † Pliny Hist. Nat. L. xii c. xiv.

‡ Idem. § Strabo Exp. Ælius Gallus L. xvi. || Theophrast. Op. cit.

¶ Pliny B. xiv c. xiv. Eng. Trans. Holland. ** Niebuhr Descrip. de l'Arab. T. iv. Quest. xxix. French Trans. †† Niebuhr Op. cit.

Rumph * and Stackhouse† appear to have been acquainted with it, Roxburgh‡ first described it, and Colebrooke§ gave a drawing and an account of it in the Asiatic Researches, relating the manner in which Dr Turnbull, then Surgeon to the Residency at Nagpoor, satisfactorily identified the gum of the Indian Frankincense Tree, with that called Olibanum. The produce therefore is determined, and it only remained to identify, if possible, the Arabian species, with that described and figured by Roxburgh and Colebrooke. With this view, I made a sketch|| of a branch in flower that was selected from many others which were brought to me on the 30th May 1846, at Rakheote, a small village close to Ras Sajar, on the southeast coast of Arabia, and as it appears to me to be identical with the Indian species, described and named by Roxburgh, *Boswellia serata*, I cannot do better, than add to it his description, and the accompanying observations of Mr. Colebrooke on the diversity in its fructification, almost all of which are in every way applicable to the Arabian tree.

Boswellia Serata. Roxb.

“Gen. Char. Calyx beneath, 5 toothed. Corol. 5 petaled. Nectary a crenulated, fleshy cup, surrounding the lower part of the germ, with stamens inserted on its outside. Capsule 3-sided, 3-celled, 3-valved. Seeds solitary membrane-winged.

“Spec. Char. Leaves pinnate, leaflets serate downy. Racemes simple, axillary. Petals ovate. Filaments inserted on the exterior margin of the nectary.

“A large tree, a native of the mountains of India. A most fragrant resin is collected from wounds in the bark, &c.

“Leaves crowded about the extremities of the branchlets, pinnate with a single terminal one.

“Leaflets sessile, sometimes opposite, sometimes alternate, in general about 10 pair oblong, obtuse, serate, villous; length about an inch or an inch and a half.

* Herbar. Amboin. Par. 1. L. iii. c. iii. † Ext. Bruc.p. 19.t. 3 Wight and Arnott. ‡ Flora. Ind. 2. p. 383. § As. Res. 9. p. 377. || Vide fac-simile Plate xxiii.

"Petioles round, downy.

"Racemes axillary, simple, shorter than the leaves, downy.

"Bracts minute.

"Flowers numerous, very pale, pink, small.

"Calyx five lobed, downy. (Perianth 1-leaved 5-toothed) Corol. petals five oblong expanding, downy on the outside, and considerably longer than the stamens.

"Nectary a fleshy crenulated cup, (coloured and adhering to the calyx) surrounding the lower two thirds of the germ.

"Stamens: Filaments ten, alternately shorter, inserted on the outer edge of the mouth of the nectary. Anthers oblong.

"Pistil: Germ above, ovate. Style cylindric, stigma of three pretty large lobes.

"Pericarp: Capsule oblong, three sided, three celled, three-valved, size of an olive, smooth.

"Seed solitary, winged, broad, cordate at the base, deeply emarginate, point long and slender, and by it inserted into the apex of the valve of the capsule to which it belongs."*

Variations in the fructification, &c.

"The fructification is remarkably diversified on the same plant. I have found even on the same raceme, flowers in which the teeth or lobes of the calyx varied from 4 to 10. The number was generally 5, sometimes 6, rarely 7, more rarely 4, and very rarely 10. Petals as many as the divisions of the calyx; stamens twice as many; capsule generally 3-sided, sometimes 4, rarely 5-sided, with as many seeds and as many valves. Seeds generally solitary."† ‡

* As. Res. 9. p. 379. † Idem.

‡ Since this paper was presented to the Society I have to a certain extent been able to compare a specimen of the Frankincense Tree which I brought from Arabia, with the *Boswellia serata* now in the Horticultural Garden at Bombay: and, though I have no reason to doubt its genus, yet there are some points, in which it slightly differs from *B. serata* which I wish to notice, in case those better acquainted with both the Indian species than myself, may consider them sufficiently specific to entitle the Arabian tree to a separate denomination.

In the Arabian tree, the leaflets are oval, of a deep green colour, glossy and sparsely-pilose; (in both it and the specimen of *B. serata* mentioned, they are crenate-serated and wavy); they average six pairs, an inch in length, and with the confluence of the terminal leaflets amounting to double, and frequently

In addition to India, and that part of Arabia which I shall presently point out, the Frankincense Tree is found in great abundance in Eastern Africa, on the limestone mountains which extend westward from Cape Gardafui through the country of the Somalis; * I have seen a living specimen in foliage brought from thence, and large quantities of the gum which is imported at Makalla for re-exportation to India: both the produce and the tree of Africa and Arabia appear to be the same, and I have no doubt from Rumph's description of the *Canarium hirsutum* in Amboyna, we may also safely extend its geographical distribution eastward to the Molucca Islands. †

Ibin Batuta calls the tree *al kundooroo*. ‡ الكندر

The gum is called by the Arabs *laban*. لبان

The Maharas call the tree *maghrayt d'sheehaz*, مغرت ذ شبحز, and the gum *sheehaz* شبحز; but the latter are local terms, which are only generally understood among the inhabitants of that part of Arabia in which the tree grows.

The gum is procured by making longitudinal incisions through the bark, in the months of May and December, when the cuticle glistens with intumescence from the distended state of the parts beneath: the operation is simple, and requires no skill on the part of the operator. On its first appearance, the gum comes forth white as milk, and according to its degree of fluidity, finds its way to the ground, or concretes on the branch near the place from which it first issued, from whence it is collected by men and boys, employed to look after the trees by the different families who possess the land in which they grow.

It is curious to observe how correct the ancients were in many of their remarks concerning the Frankincense Tree, and in their description

treble the size of any of the others. The pericarp is pear-shaped and about half the size of an olive; indeed, the tree throughout appears to average half the size of the *B. serata*. The new cuticle is of a bright hazel brown, color, peeling off in large deciduous flakes from the bases of the principal branches and the trunk, and none but the oldest portions are cinereous. The racemes are fascicled, and as long as the leaves; in Dr. Roxburgh's description they are simple and shorter than the leaves.—H. I. C.

* Visit to the Frankincense country by Capt. Kempthorne, I. N. Jour. Geo. Soc. Bombay, 1841 to 1844 p. 402. — Carless's Chart of the Coast near Gardafui. † Rumph Op. et loc. cit. ‡ Ibin Batuta printed char. with Eng. Trans. by Lee. p. 16

of that part of Arabia in which it grew ; curious, because in our days, no one thinks it worth his while, to go beyond the bare coast-line of Southern Arabia.

Theophrastus * and Pliny † have written, that it was only to be found in a particular part of Arabia, and that the name of the country in which it grew was *Saba*, the capital *Sabota*, which was eight days journey from the *thuriferous region*. The tree was about five cubits high and much branched, with leaves like those of the *Acacia*, and of an herbaceous green colour ;—a description almost sufficient to enable one at the present day, to fix immediately upon the tree, in that part of Arabia where it grows. It grew on the mountains, and in the valleys beneath, and from the former small streams flowed into the plains. The soil was sub-argillaceous, sandy, and of a red colour inclining to white. To obtain the gum, slits were made in the bark, but no portion was cut away ; that part of the incense which adhered to the tree when taken off, carried with it portions of the bark. The mountains and woods where it grew, were divided among the Sabians, and there was a strict faith observed towards each other, respecting the parts they severally possessed. — But for the disappearance of the Sabians and their towns, I could not offer a more correct description.

They relate also, that the incense was transported on the backs of camels, in bags and packages, marked with the owner's name and the price ; these were deposited in the temple of the sun at *Saba*, ‡ and the whole transaction was held so sacred that they were left unguarded, and no one entertained the slightest apprehension of being robbed of the smallest portion of his gum ; merchants arriving there paid the prices marked on the packages, one third of which was taken by the priest for the god of the temple, and the remainder was left for the people to whom the frankincense belonged. Arrian writes, that the whole of the frankincense of the *Sachilitic Sinus* was collected into one great heap, which, from its sacred nature, received safe protection from the gods ; neither could any one secretly, or openly, take away a grain without the permission of the king, nor a ship laden with it leave the port against the will of the gods. §

Theophrastus, Pliny, and Arrian, however, differ a little in this unim-

* Theophrast. Op. cit. † Pliny Op. cit. ‡ "In urbe Sabis" Salmasius T. 1. p. 355. A. § Arrian. Perip. Mar. Eryth.

portant detail; that it was carried on the backs of camels holds good to the present day, simply because in those parts there has never been any other way of transporting baggage, but the Sabian religion having passed away, there is now unfortunately for the "lords of the soil," no longer any mystery connected either with the tree, or its produce; and the gum, as it is collected, is brought to the nearest port, and finds no other outlet at the present time, but on the coast. Dear as it appears to have been in Pliny's time, when those who were employed in refining it at Alexandria entered upon their occupation "hoodwinked and naked as they were born", * that they might neither see to covet, or have power to conceal the smallest portion of it about their persons; it is now so cheap that it is difficult, even in the country where it is produced, to obtain a sale for it at any price.

The insalubrity of that part of Arabia in which the Frankincense Tree grows, is also fabulous. Diodorus Siculus said the country was infested with the most venomous snakes; † Arrian, that it was so unhealthy that not only the laborers who lived in it, and who were compelled from want of food to engage themselves in the employment of collecting the gum, died of the pest peculiar to the locality, but, that even those who sailed along that coast were affected by the same unhealthy influence. ‡ Probably the Sabians themselves raised these reports, from a desire to intimidate foreigners, who, from other motives than those of mere curiosity, might have wished to visit their country, then so remarkable for the value of its produce. In whatever way it originated, it is incorrect, inasmuch as the climate of the mountainous part of Arabia on which the Frankincense Tree grows, is most invigorating and healthy; it is the abode of the Bedouins of the district, and the resort of the lowland people of the coast during the hot season.

GEOGRAPHICAL POSITION.

In pointing out the position of the Frankincense Region of Arabia I shall dwell on the subject, more for its geographical than for its botanical interest.

* Pliny. Holland's Trans. loc. cit. † Diodorus Siculus. Bibl. Hist. T. 1. L. iii. p. 214. Wessling. ‡ Arrian Op. cit.

Those who have attempted to compare the ancient with the modern geography of Arabia, are aware of the difficulty that exists, from the scantiness of detail in the former, of identifying names, localities, and places, mentioned by the ancients, with those of the present day; and, on this account, it is not a little gratifying, occasionally to meet with such aids as enable us to do this, without having to recur to the flexibility of the Arabic language, to anagrams and transpositions, or to a train of reasoning open to all kinds of objections. I allude in the present instance more particularly to the limits of the frankincense region, after pointing out which I shall endeavour to shew by their undeniable evidence, that Ptolemy's *Libanophorous region* is misplaced, and, by assigning to it its real position, hope at some future period, (assisted by other features equally imperishable and unalterable as those of the frankincense country,) still further to elucidate the ancient geography of the southeastern coast of Arabia.

The limits of the Frankincense Region of Arabia, situated on its southeastern coast, about midway between Ras-al-Had and Cape Aden, have, so far as it has been in my power, been ascertained in the following way. Passing along the coast from the northeast, I have by direct information, and by personal observation of the nature of the country, been able to satisfactorily determine the point, whereat the frankincense tree is first met with, the latitude of which, from the direction of the coast, at once gives its northern and eastern limits: while its extent westward has been ascertained, by carefully enquiring at each town along the coast in that direction, what quantity of frankincense is annually brought to it from the interior, until arriving at that place where the produce of the Arabian tree is never seen. In the same way by the quantity of frankincense brought to the several towns from the interior, it is easy to determine opposite to what part of the coast the tree most abounds, for the gum is so cheap, that to be worth any thing to those who collect it, it must be brought by direct route to the coast from the place where it is gathered.

Coming then from the northeast, we first meet with the frankincense tree on the Sabhan mountains in latitude $17^{\circ} 30' N.$, and longitude $55^{\circ} 23' E.$, where the desert ends, and the wooded mountainous region commences; and in following the coast, which runs southwest, we find the quantity of frankincense exported from the different towns, gradually diminishing after the Bay of Al Kammar, until we arrive at Makalla, from whence none is exported from the interior of Arabia, and but little used

except what is brought from the African coast opposite that town. By the same inquiry we learn, that the produce of the Arabian tree, is exported in largest quantities, from places on that part of the coast which intervene between the latitude and longitude mentioned, and the town of Damkote, in the Bay of Al Kammar, in $52^{\circ} 47'$ east longitude.

Between these two points, the trees are congregated in two distinct localities; on the summits and sides of the highest range of mountains near the coast, and on the plain between them and the sea: the former is called the *Nejdee* نجدى or high land, the latter the *Sahil* ساحل or plain on the coast. *

The *Nejd* or *Nejdee*, is about two days journey from the shore, it is the most elevated portion of the great limestone formation of this coast, which from a height of five thousand feet, here descends in sudden and lofty steps upon the Arabian Sea. To get to it you first cross the *Sahil* already mentioned, then ascend a minor range which is covered with long grass and trees, and after passing a less fertile region called the *Gāthān*, at last arrive at the *Nejdee*, where there is no grass, and but few trees besides those which produce the frankincense. The soil is red and sub-argillaceous, and in consequence of its scarcity, the trees are generally found growing out of the crevices of the limestone rock. It is from this part that the frankincense is chiefly brought; and as I have before said, that the largest quantities of it, are exported from the different towns on the coast between longitudes of $52^{\circ} 47'$ and $55^{\circ} 23'$ E., so the *Nejdee* lies behind these towns and between these points of longitude.

The other locality, viz. the *Sahil*, lies in front of that last mentioned; it is the plain between the base of the mountains and the sea, and is bounded on the east by the mountainous promontory of Ras Noos, and on the west by that of Ras Sajar. The frankincense trees are mostly

* Theophrastus says (Op. cit.) that those who went to see the Frankincense Trees, saw also the Myrrh Trees at the same time; this might have been the case in the Somali country where I believe it to be a fact, but not in Arabia; for where the frankincense tree exists in the latter country, the myrrh tree is unknown and *vice versa*; thence the ancient distinction of *Smyrnophorous* and *Libanophorous* regions. There is a tree called by the Bedouins *Akor*, which yields *Mogl*, a gum slightly resembling myrrh in appearance and taste, but not in its perfume which is disagreeable, and which the Persians and Arabs use as a fumigation in the cure of Hæmorrhoids: this grows side by side with the frankincense tree and is equally plentiful.—H. I. C.

congregated towards each extremity of it, viz. about Marbat, and in the neighbourhood of Bandar Resoot, where they are found at the base and on the sides of the mountains, about five miles from the shore, and I believe they are also met with in a similiar position near Hasek. The quantity of frankincense that is collected from them is proportioned to their number, which bears no comparison with the myriads that are spread over the *Nejdee*. The soil of the *Sakil* only differs from that on the tops of the mountains, in being richer and more abundant; collections of fresh water are common in most parts of it, and among the mountains above are rivulets and reservoirs, truly said by Theophrastus "not to be found elsewhere."—* In no part of the southeastern coast of Arabia, is there such an abundance of fresh water, such good land, such rich pasture, and such a variety of plants, shrubs, and trees, as in the Frankincense Region. It may fairly be said, to be the favoured part, the garden of Southern Arabia, while both east and west of it, all is characterized by a cheerless, dreary, arid waste.

So well as the Frankincense Region of Arabia is marked by its comparative fertility, in addition to its having ever yielded large quantities of an incense, that, from the remotest antiquity has been considered by the heathen nations of the eastern world as an essential in their religious ceremonies, it is not surprising that it should have gained for itself the appropriate designation of the *Libanophorous region*, under which appellation we meet with it in the geography of the ancients. But, as they do not appear to have been agreed as to its position, and their Commentators have been unaided by the means which we now possess to adjust their difference, I shall in conclusion, offer a few observations on its real position, compared with that which some of them would appear to have assigned to it.

On looking at Mercator's map of Ptolemy's Arabia, after what I have written, the misplacement of the *Libanophorous region*, becomes obvious; instead of being situated in the central part of the southeast coast of Arabia, we find it carried up into the province of Oman, upwards of four hundred miles from its real position, to a part of Arabia where, from the late Lieut. Wellsted's personal experience, † and my own repeated enquiries of the inhabitants of that province from north to south, I am satisfied the tree does not exist. On the other hand, Arrian, or the au-

* Theophrast. Op. cit.

† Wellsted's Trav. in Arab. V. I. p. 285.

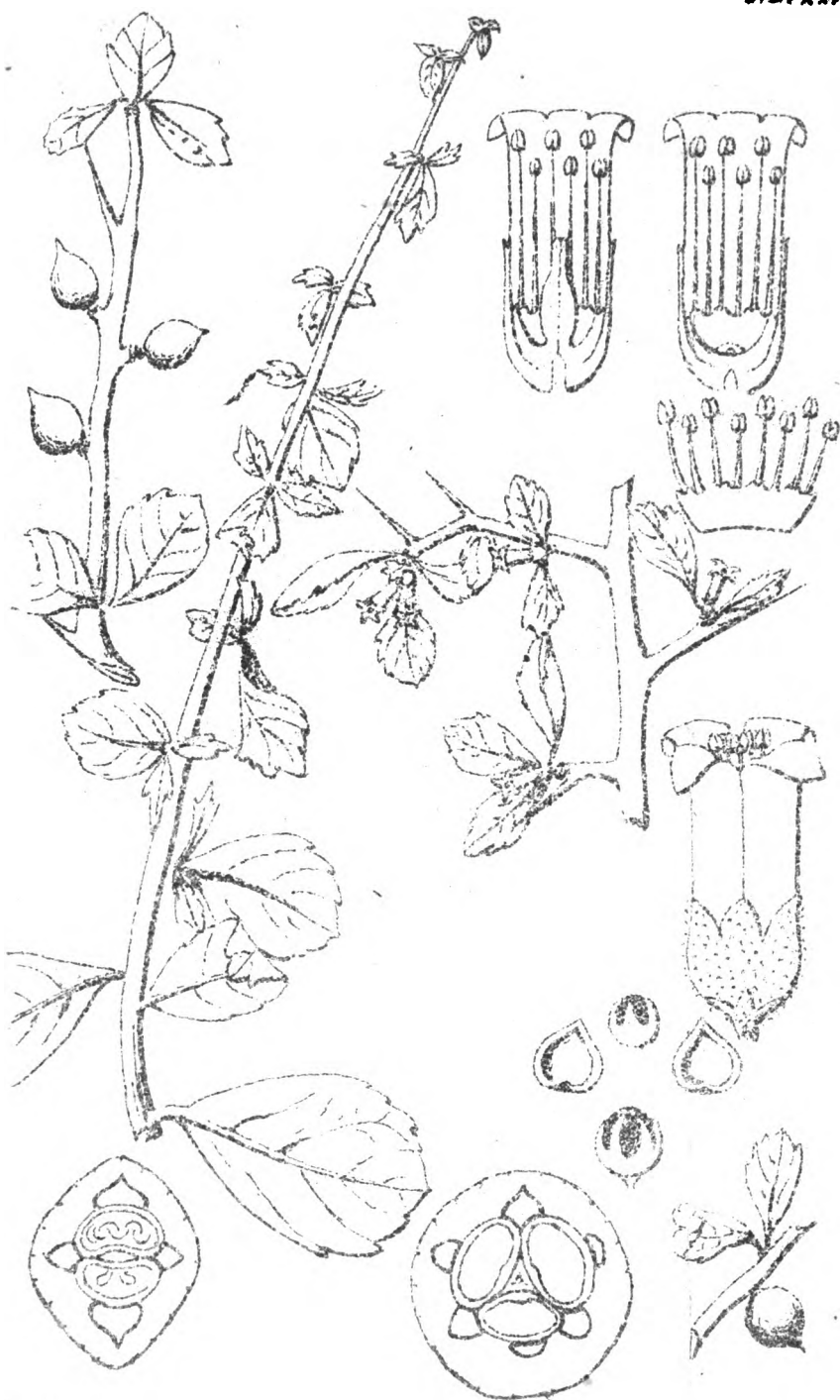
thor of the Periplus, * the most intelligible of all the ancient Geographers, in describing the southeastern coast of Arabia, advancing eastward, commences his *Libanophorous region*, at the *Syagrian Promontory*, (Ras Fartak,) which, in his general description, is sufficiently correct to shew that he was perfectly aware of its real position; yet, accurate as Arrian is in this instance, it is not more easy to comprehend why he should have said "adjoining Syagros" is a bay which runs deep into the mainland of *Oman*, than that Ptolemy should have transported the *Libanophorous region* across the great desert of Ahkaf, to that part of Arabia, which alone bears the name of Oman at the present day. Those who have witnessed the relative position of the Akhdthoor mountains of Oman in the northeast, and the abrupt commencement of the Nejdee or the Sabhan mountains on the southeast coast of Arabia, with the vast expanse of desert between them, cannot well conceive how the oversight could have happened, and can come to no other conclusion, than that both Ptolemy and Arrian must have been misinformed, or have misunderstood their informants; the former as to the position of the *Libanophorous region*, the latter as to the extent of the province of *Oman*; unless we suppose, that formerly the province of Oman extended further to the westward than it does at the present day, when both Ptolemy and Arrian would be right as to the country, but the former must still remain wrong in the position of the *Libanophorous region*. In whatever way we conceive the error to have originated, or attempt to solve the difficulty, we must allow, that Ptolemy's *Libanophorous region* has been misplaced, and that the position given to it by the Author of the Periplus is the correct one.

ARTICLE V.—On two Balsam-trees (*Balsamodendra*) from Sindh. By Assistant Surgeon J. E. Stocks, Vaccinator in Sindh.

1. *The Googul Balsam-tree.*

The gum-resin Googul (گوگل) has had its synonyms traced out by Sprengel (Hist. Rei Herbariæ I. 272), followed by Ainslie (Materia Indica I. 29), and Royle (Ill. Botany Himal. Mount. p. 176), and is the Mukul (مقل) of the Persians and Arabians, and the Bdellium

* Perip. Mar. Eryth.



W. Alcock del. J.E.S. dissect.

H.C. Sm.

Balsamodendron Roxburghii (Am.)

(βδέλλιον) of Dioscorides and (?) Genesis 2. 12; Numbers 11. 7.

There has always been, however, some degree of uncertainty about the tree from which it is taken.

It is unnecessary to dwell on the idea of Kœmpfer (*Amœnitates*, p. 668) that it is produced by the *Borassus flabelliformis*, or of Matthioli, that it comes from the *Chamœrops humilis*. Moreover it has no connection with the Googul of the Coromandel Coast, which is the Koonder gum from the *Boswellia glabra* (Ainslie I. 136). Virey, (*Hist. Nat. des Medicamens* p. 291) first suggested that *Bdellium* came from an *Amyris*, the Niotoutt of Adanson, Voy. 162. *Heudelotia Africana*, *Flora Senegambiae* 1. 150. *Balsamodendron Africanum*, Arnott in *Annals Nat. Hist.* 3. 87. It is probable that African *Bdellium* is yielded by this shrub, which is a closely allied species to the Indian Googul-tree. This tree Roxburgh had growing in the Calcutta Garden, and described in the *Flora Indica* 2. 244, under the name of *Amyris Commiphora*, with the Sanscrit synonym of Googula; but he was not aware of its yielding a bazaar-gum.

In the *Hortus Bengalensis* it appears as the *Amyris Agallocha*, which was probably the name finally adopted by Roxburgh, from some suspicion of the distinctness of Jacquin's plant, the supposed identity of which had suggested the specific name in the *Flora Indica*.

Royle had this plant in the Saharunpore Garden, and was informed that it produced the Googul gum-resin, but recommends (*Him. Botany*, and more recently in his work on *Materia Medica Lond.* 1847) that the subject should be followed up by those who have the opportunity of examining the flowers and collecting the gum.

The tree is abundant on rocky ground in Sindh, about Kurrachee, Garrah, Tattah, Jerrok, &c. in short wherever the limestone formation extends. It is therefore, most probably, very common in Beloochistan and up the Persian Gulph, and is one of the plants connecting the Syrian and Indian Floras.

BALSAMODENDRON ROXBURGHII (Arnott).

Amyris Commiphora.—Rox. *Fl. Ind.* 2. 244.

Amyris Agallocha.—Hort. Beng. p. 28.

Protium sp. *Balsamodendron*.—W. and A. *Prod.* p. 96.

Commiphora Madagascarensis.—Lindl. *Fl. Med.* p. 173, and

O' Shaughnessy, Beng. Disp. p. 287, non (?) Iacq. Hort. Schön 2. 66. t. 247.

Balsamodendron Roxburghii.— Arn. Ann. Nat. Hist. 3. 86, and Wight Illust. 1. 185.

Balsamodendron Agallocha.— Voight. Hort. Suburb. Calcutt. p. 150.

A small tree 4 to 6 feet high, or more generally a stunted bush, with thick branches spreading on all sides. In barren and rocky situations the gnarled limbs spread from the crown along the surface of the rock. Branches knotty and crooked, with the ash-coloured bark peeling off in flakes; the sub-terminal ones short and spiniform, with buds and secondary spines on them.—Leaves and flowers collected at the end of short stunted buds, which finally develop into spines, or become young soft shoots, on which the leaves are arranged alternately.

Leaves smooth and shining, obovate, almost sessile, shallowly toothed anteriorly, the tapering base entire; in thriving plants and luxuriant shoots inciso-serrate, cuneate-obovate or oval-acute, with a longer stalk from which spring one, or more generally two, lateral leaflets, which are sometimes minute and entire, but generally serrated, half the size of the terminal leaflet, and overlapping it in its induplicate vernation.

Young leaves, while in the bud, covered with glandular hairs which soon drop off, a few only remaining in the axil and on the petiole. Flowers minute, in little bundles at the ends of the non-developed buds, with or without leaves, subsessile, with 3 minute bracts to each flower.

Calyx cylindrical, 4—5 toothed, thickly covered externally (as are the bracts) with glandular hairs; tube splitting as the fruit develops, and remaining spread out and withered at its base. Corolla of four, rarely five, strap-shaped, brownish-red petals; margins slightly overlapping in æstivation, with an inflexed mucro; tips of the petals curled back.

Stamens 8—10, the four opposite the petals, shorter than the others.

Disk 8—10 toothed, the alternate sinuses deeper and in these are situate the short stamens. Ovary bisulcate, two-celled, rarely three-celled, and still more uncommonly four-celled; sometimes imperfectly developed. There is no relation between the quinary proportion of the perianth, and this increased number of the carpellary leaves.

Ovary tapering upwards and passing imperceptibly into the short and thick style.

Stigma obscurely two-lobed.

Ovules two in each cell, collateral, suspended.

Drupe red when ripe, ovate-acuminated, often bluntly angular, marked by two sutures along which the epicarp and a portion of the mesocarp fall from the base in two fleshy valves, whose position is that of the carpellary leaves, leaving the nut enveloped by a four-cleft orange-coloured pulp, whose arms meet at the apex.

Nut ovate-acute, readily splitting into two. Each half has a groove on the commissural plane, bifurcating upwards. Into this groove fits a prolongation of the axis.

The drupe has sometimes 3 sutures, and a six-cleft pulp; and rarely 4 sutures, 4 nuts, and a four-cleft pulp.

Out of a parcel of 56, two had 3 sutures and one had 4 sutures, the rest being normal.

Seeds generally one in each cell or $\frac{1}{1}$ (two ovules being abortive), often $\frac{0}{1}$ (three abortive), more rarely $\frac{2}{1}$ (one abortive), still more rarely $\frac{2}{0}$ (two abortive), and very seldom $\frac{2}{2}$ (all perfect).

Out of a parcel of 41

15	were	$\frac{1}{1}$
13		$\frac{0}{1}$
5		$\frac{2}{1}$
8	all abortive or uncertain.	
<hr/>		
41		

Out of a parcel of 61

24	were	$\frac{1}{1}$
17		$\frac{0}{1}$
8		$\frac{2}{1}$
4		$\frac{2}{0}$
2		$\frac{2}{2}$
6 all abortive or uncertain.		
<hr/>		
61		

Albumen none; embryo straight; radicle superior; cotyledons thin, intricately crumpled and plaited.

Obs. 1. This shrub is called Googul or Googur, by the Hill-Belooches, who do not know it by the name of Mukul. It yields the gum-resin Googul, which they collect and bring to the bazaars of Hydrabad and

Kurrachee, where it sells at the rate of 4 Rupees the Maund of 80lbs. At Bombay, its Tariff valuation is 2 Rupees the Maund. It is collected in the cold season by making incisions with a knife in the tree, and letting the resin fall on the ground. Hence the dirty and impure state in which it is found in the shops. I have obtained it from September to December, and have found it stand off in large tears from a clean incision, of the consistence and opacity of "pus laudabile." My informants say that from half to a whole seer is yielded by a single tree. It is regarded as cordial and stimulant.

Made up into a cake with bajree flower, it is commonly given to horses and cattle when they have a cold. The dealers from Cabool make a practice of giving it to their horses in the cold season, thinking that it keeps them in health and condition. The fruit and young shoots are given for a similar purpose.

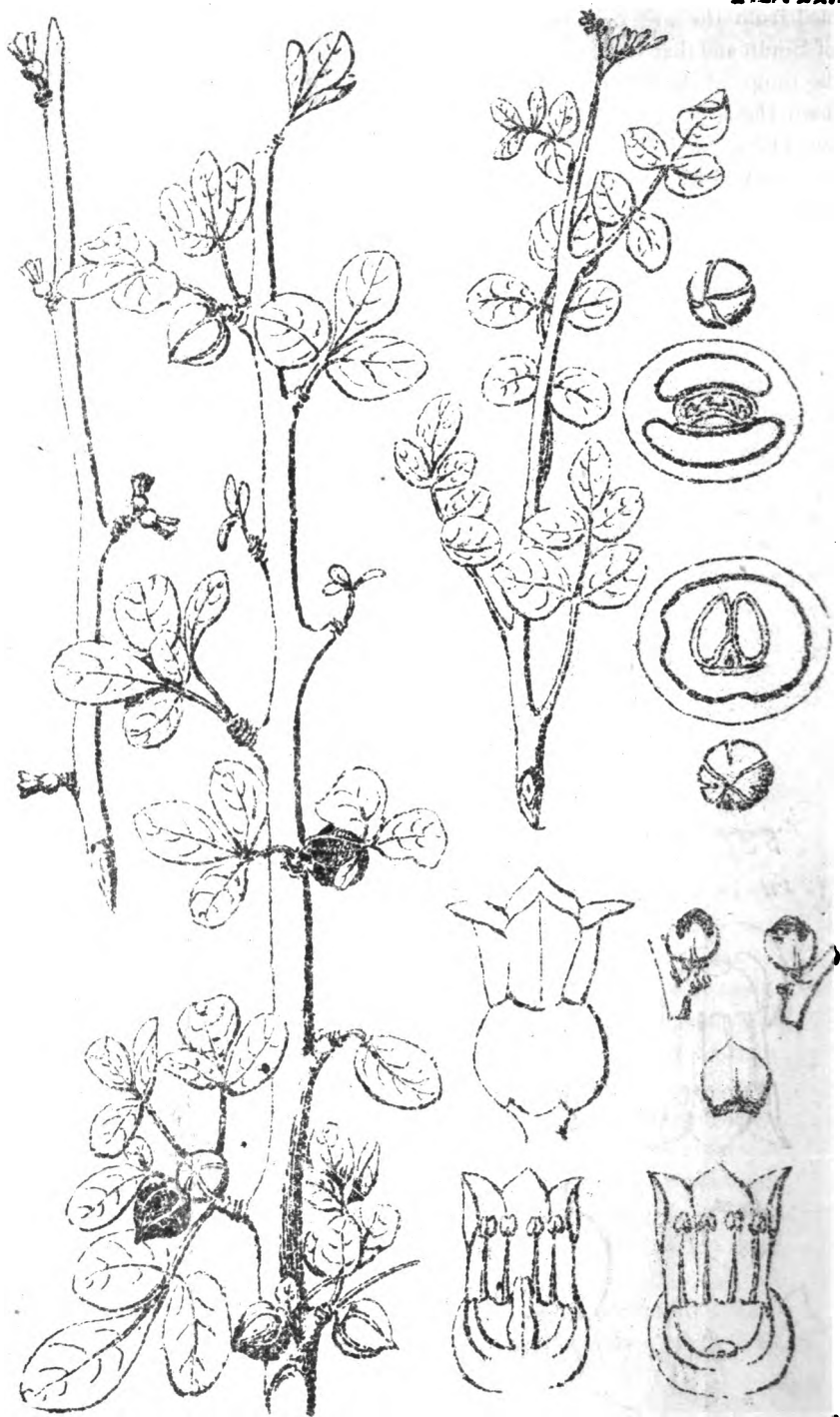
The gum is made into a plaster and used to discuss tumours and boils, and is regarded efficacious in expelling the guinea-worm both taken internally and applied to the tumour.

It is extensively used by the Hindoos as incense for burning in their temples, although its smell is by no means agreeable.

It is also much used by builders, who mix it with the mortar and plaster used in the construction of houses of a somewhat superior description, where durability is an object. The Googul is boiled in water for a considerable time, when its spirit (as they phrase it) is communicated to the water, and the dregs are thrown away. This solution of the gummy part, which according to Newman's analysis should be six drachms, two scruples in every ounce, is mixed with the lime, and employed with confidence to make the plaster adhere strongly, and to prevent it from crumbling and splitting. The Googul water is sometimes washed over the walls by itself.

OBS. 2. My friend Assistant Surgeon Carter showed me fine specimens of the "Mukul" gum collected by him on the southern coast of Arabia, together with numerous other gums, all accompanied by admirable drawings of the trees producing them. There is, therefore, some error in the statement of Dr. Malcolmson (Royle's *Materia Medica*) that Bdelium is not produced in Arabia.

Moreover the "Mukul" and the tree producing it, are from Dr. Carter's specimens, identical with the Sindh Googul, and its tree, as might be



W. Abraham. del. J.E.S. direct.

A.T.C.L.

Balsamodendron pubescens (J.E.S.)

expected from the great similarity between the vegetation of the rocky part of Sindh and that of Arabia.

The range of the Googul tree is extensive. Arabia (Dr. Carter); Northern India (Dr. Royle); Silhet and Assam (Roxburgh); and the Garrow Hills (Voigt). Aurungabad? (Dr. Walker). The Deccan? (Dr. Gibson). I have found it in Sindh, and at Deesa in Marwar.

2. *The Sindh Balsam-tree.*

BALSAMODENDRON PUBESCENS. (Stocks.)

A small tree, or stunted shrub, much resembling the Googul tree, but the sub-terminal branches, though abrupt, are not spiniform. Bark peeling off in flakes. Leaves ternate, fascicled at the end of the stunted buds, but on the young soft shoots alternate, with an additional distant pair of leaflets; long petioled, soft and downy (as are the young shoots) with short furfuraceous pubescence. Leaflets obovate, entire, often retuse; the terminal one stalked, the lateral ones subsessile, often somewhat rounded.

Flowers, sessile in bundles at the end of the stunted buds.

Calyx, tube shallow, contracted at the mouth.

Petals, red or white, with æstivation as in the Googul, but erect and not reflexed at the apex in anthesis.

Stamens, equal in height.

Disk, equally toothed.

Ovary, as in the Googul.

Drupe red, globose with a short point, marked by four conspicuous white sutures, the alternate ones (corresponding to the mid-rib of the carpellary leaves) not reaching to the apex of the fruit. Valves two, each cleft half way up by the secondary or false suture. Pulp orange coloured, four-toothed upwards, not reaching to the apex of the nut which is left naked. Nut ovate obtuse; one of the halves into which it splits is a mere flat plate or scale, the other is a perfect cell grooved on the commissural plane. Sometimes the number of carpellary leaves is increased. Thus out of a parcel of 120 there were four, and out of a parcel of 200 there were seven, which had 6 sutures and a pulp 6 toothed towards the top.

In these cases the additional carpel was represented by a second flat plate, or more rarely there were two perfect cells and one abortive

One seed in each perfect carpel.

Albumen none; embryo straight.

Radicle, superior; cotyledons, crumpled and plaited.

OBS. 1. This shrub is called Bacc by the Hill-Belooches, who make no use of it. Its young shoots and buds are remarkably fragrant when bruised. In the cold season it yields a small quantity of a tasteless, inodorous, brittle gum, almost entirely soluble in water. It flowers scantily in October, and its leaves and young shoots appear with a few flowers in April and May. It is a native of Beloochistan and the hills which separate that province from Sindh; probably also of Afghanistan, attaining its southern limit about Kurrachee.

OBS. 2. Dr. Arnott makes two sections of the genus *Balsamodendron*, depending on the relative depth of the calyx. The Googul tree has its calyx long and tubular. The one just described has its calyx shallow; and this is especially observable in a section of the flower. Moreover its fruit differs in having two additional imperfect sutures, in which it agrees with *B. Gileadense* and *Kafal*, as we gather from Forskall, and from *B. Berryi* and *Wightii*, as Dr. Wight kindly informs me.

ARTICLE VI.—*On the Brahmanical manner of contracting third Marriages.* By the Rev. J. STEVENSON, D. D.

The ancient Hindu legislators, not having courage enough openly to denounce polygamy, and yet having wisdom sufficient to see the hurtful effects of such a custom, if carried to any great extent, have endeavoured to deter men from its practice by working upon their superstitious fears. Bigamy they permit unchallenged, but place what might at first sight appear an insuperable barrier in the way of contracting a third marriage, by asserting that he who does so, will invariably die in a short period after the ceremony; and this wholly irrespective of the consideration of the wives formerly wedded being alive or dead. Indeed, it is by no means considered respectable for a householder to contract even a second marriage, while his former wife is alive, provided that he has a son; the want of an heir to inherit his property and perform his funeral rites being considered the only proper excuse for departing from adherence to what is generally admitted to be the law of Nature. Brahmanical ingenuity has,

however, without the indecency of running openly in the face of a threatening contained in one of their sacred books, found a way of evading it by getting married the third time to a shrub called by them *Rui* (रुई) a kind of Swallow wort. After this ceremony has been gone through, all the danger falls on the poor vegetable; and so leaving the Purans and their curses behind him, the disciple of the Brahmins may run in the path of polygamy as far as he feels inclined.

Thinking that a short description of such a singular rite might be interesting to the Society, I have translated a short account of such a marriage drawn up by the Principal of the Hindu college at Poona, and transmitted to me by the Superintendent, Captain Candy. The paper is to the following effect.

“In the Matsya Purāna, a third marriage is prohibited, and it is there declared that if any one through ignorance or presumption contract such a marriage he will die, and this denunciation rests on the authority of Garga. In the work that contains the Synopsis of rites and ceremonies, it is stated that if a third marriage is contracted, the woman will speedily become a widow, and therefore in order to accomplish a fourth marriage it is necessary first of all to be affianced to the Rui tree. The rite is performed in the following manner: On Sunday or Saturday, or any time when the sun is in the Lunar Asterism Hasta, let the resolution be expressed and the message of greeting sent by a Brahman. Then let the Manes of the deceased ancestors be worshipped under the name of Nāndimukha (Pleasurable faces). The Rui tree is then to be worshipped through the priest, and to be considered as a representative of the sun in union with his wife Chháyá (Shadow); an offering at the same time of raw sugar and boiled rice is to be presented.

Then the following invocation addressed to the Sun is to be made:—
“O thou who dwellest in the three worlds, do thou along with thy wife Chháyá obviate the dangers that attend a third marriage and confer on me felicity.” Then placing the hand three times on the bush, it is thus to be addressed at the first time :

“O Rui, created by Brahmá Deva that thou mayest preserve me, therefore, O beneficent goddess, I prostrate myself before thee. O daughter of the Sun, I worship thee; mercifully preserve me now that thou art come to be my wife.” At the second time, he says, “O swallow wort, thou wert produced by Brahmá Deva for the benefit of all living beings. Thou art the first born of trees, who increasest towards us the love of the gods, obviate

the dangers of a third marriage." Then putting the hand out the third time, after this the priest is to say, "I will give to you of such a tribe my daughter Arkakanya, the grand daughter of Savita, the great grand daughter of Aditya, of the tribe of Kasyapa." Then the ceremony of presenting curds, honey, and sweatmeats, is to be performed. The veil is then to be drawn between the parties, and the marriage benediction pronounced. Afterwards the veil is removed, the newly wedded husband puts a garland on the tree, and the priest one on him in the name of his new wife; the marriage is thus rendered indissoluble. Then the priest says, "Now I have given to thee my daughter Arkakanya, the grand daughter of Savita, the great-grand-daughter of Aditya, of the tribe of Kasyapa. After this, gifts are to be given to the attendants and to the priest." Then a thread is to be passed round the newly married pair, and a bracelet bound on one of each of their hands. Vishnu is then to be worshipped In all the four points of the compass sacred fire is also to be consecrated, and oblations made to Brahaspati, priest of the gods, to Agni (Fire), Vayu (Wind), Surya (the Sun), and Prajapati (the Progenitor of mankind). Two cows are next to be given to the officiating priest. Then the newly married husband is to utter the following prayer, "O Arka (Sun), as I who am a man, have gone through this ceremony with a tree, grant me descendants and pardon whatever has been done amiss." After which he takes some water and casts it from his hands as the termination of the rite.

[*Translation of the Preceding.*]

तृतीयेशीं विवाह करण्याचा निषेध.

मत्स्यपुराणामध्ये रतिसाठीं तृतीयेशीं विवाह कधींहि करूं नये, मोहाने किंवा अज्ञानाने जर तृतीया मानुषीशीं विवाह करील तर मरेल यांत संदेह नाही, गर्गाचें वचन याप्रमाणें आहे, असा आहे व संग्रह ग्रंथां तृतीयेशीं लग्न केल्यास ती विधवा होईल, यास्तव चतुर्थ विवाह होण्याकरितां रुईशीं विवाह करावा असें लिहिलें आहे. त्याचें विधान; तर रविवारी, किंवा शनिवारी, किंवा हस्तनक्षत्री नवव्याने संकल्प करून स्वस्तिवाचन (आशीर्वचन) ब्राह्मणाहीं कडून करवून पित्रांस

नांदी मुख नाम लावून, नांदी श्राद्ध करून, आचार्य वरून रुईचे ठाई छायायुक्त सूर्याचें पूजन करून, गुडादनाचा नैवेद्य करून, संतूनी वेष्टन करून, हे रवे त्रिलोकांत राहणारा छाया सहित तूं तृतीय विवाहजन्य दोषाचें निराकरण करून, सुख कर, अशी प्रार्थना करून तीन वेळ पाणी घालावें; माझी प्रीति करणारे, मी उत्पन्न केलेली, प्राचीन सूर्यापासून जात, ब्रह्मदेवाने उत्पन्न केलेली रुई आह्माला संरक्षो, ह्मणोन एकवेळ हे मंगलकारके देवी तुला नमस्कार असो. हे सूर्य पुत्री, तुला नमस्कार असो. मला कृपेने राख, तूं माझ्या पत्नीत्वाप्रति आलीस. ह्मणोन दुसऱ्याने. व हे अर्कवृक्ष तूं ब्रह्मदेवाने सर्व प्राण्यांच्या कल्याणार्थ उत्पादित आहेस, तूं वृक्षांचा आदिभूत आहेस, देवांची प्रीति वाढिवणारा, तृतीय विवाह जन्य दोषाचा, व मृत्यूचा लवकर नाश कर; ह्मणोन तिसऱ्याने पाणी घालावें. त्यानंतर आचार्याने काश्यप गोत्रांची आदित्यांची प्रपौत्री, सवित्याची पौत्री, माझी पुत्री, अर्ककन्या अमुक गोत्रांतल्या वराला देईन, असें वाणीने दान करून, वराची मधुपर्क पूजा करून, दोघामध्ये वस्त्रधरून, मंगलाष्टक ह्मणून, मग वस्त्र काढून नवऱ्याकडून रुईस माळ घालावी, व आचार्याने रुईची माळ नवऱ्याचे गळ्यांत घालावी, असें लघ लावावें. त्या नंतर काश्यप गोत्राची आदित्याची प्रपौत्री सवित्याची पौत्री माझी पुत्री अर्क कन्या अमुक गोत्रांतल्या वराला तुला दिव्ही, असें दान करून दक्षिणा द्यावी. तदनंतर रुई आणि नवरा यासभोवतें सूत्र वेष्टून त्या सुताने रुईत एक, व नवऱ्याचे हातांत एक, असीं दोन कंकणें बांधून रुईच्या चोहो दिशेस कुंभावर विष्णुपूजा करून, अभिस्थापन करून बृहस्पत्यर्थ व अग्न्यर्थ होम करून, अभि वायु सूर्य प्रजापत्यर्थ होम करून, आचार्यास दोन गाई देऊन, मी मनुष्याने वृक्षाचे ठाई हें कर्म केले हे अर्क मला अपर्ये दे, आणि तें सर्व क्षमा कर, अशी प्रार्थना करून, या कर्माने परमेश्वरास संतोष व्हावा ह्मणोन पाणी हाताने सोडावें.

ARTICLE. VII.—*Reports accompanying Copper Ore from the Island of Maseera, and on Lithographic Limestone from the Southern Coast of Arabia.* By Assistant Surgeon H. J. CARTER.

To the Secretary to the Bombay Branch Royal Asiatic Society.

SIR,—I am directed by the Honorable the Governor in Council, to transmit to you, for presentation to the Bombay Branch of the Royal Asiatic Society, the annexed Copy of Reports, by Assistant Surgeon Carter, on Copper Ore from the Island of Maseera, and Lithographic Limestone from the south-east coast of Arabia, accompanied by specimens of the ore.

I have the honor to be.

Sir,

Bombay Castle,
21st December, 1846. }

Your most obed. servant,

W. ESCOMBE,

Secretary to Government.

While the Officers of the H. C. surveying Brig “Palinurus” were engaged in surveying the channel between the mainland of Arabia and the the Island of Maseera, I occasionally amused myself by collecting specimens from the mineralogical productions of the latter, and having heard, (but from what source I cannot now remember,) that the Persians formerly worked Copper mines there, I determined to test as far as possible the validity of the report. With this view, I from time to time, as the survey of the inner side of the Island was carried on, landed and prosecuted my research by excursions across it, opposite the point at which we were stationed; but my investigations were unattended by success, and the inhabitants either could not or would not guide me to the mines, being altogether ignorant of the facts of their existence, or otherwise too cautious to enlighten me on the subject, not thoroughly understanding, for some time after our arrival, what was the real nature of our visit to their Island. We had reached the south-western extremity of Maseera, before I had the good fortune to discover a vein of the mineral, of which I had been so earnestly in search. I had wandered over many miles of the

forests of volcanic Cones, (for such is their appearance when viewed from a height), which pervade the island, and was about to relinquish my search, when, on the morning of February 1st 1846, I landed about a mile from Ras Abo Rasas, the south-westernmost point of Maseera; and after a short ramble fell in with some small portions of the blue carbonate of Copper, (Azure Malachite, M.). Had I seen the vein at that moment, I could not have felt more confident of its existence or more delighted with my success; and but a little further on, I halted at the sites of some old smelting-places, around which was a quantity of the blue mineral just mentioned, and slags containing portions of it in a reduced state; and a few moments more brought me to the object of my search viz. the ore itself *in situ*.

It occurs in the form of the blue and green carbonates, disseminated in crystalline quartz-veins which are about six inches in width, and associated with brown Hematite. These veins, to which the mineral appears to be confined, traverse a green hornblendic earthy rock in the direction of north and south; they have not been much worked below the surface, and there are no remains of shafts or subterraneous excavations in their neighbourhood.

Afterwards I discovered some of the "Blue carbonate of Copper," strewn over the surface of the ground, on the outer side of the island near Ras Jah, but as it was towards evening that I fell in with it, and the sun had set, I had not another opportunity of returning to the same spot to seek for the vein.

The third and last place where I met with the mineral mentioned, is about a mile due east of Ras Jazeera, a little Cape on the outside of Maseera, close to which is a small island. Here the veins are in a reddish trap rock, and though much richer than those at Aboo Rasas, they have been less worked; as at the latter place they are about a mile from the shore, and from fifty to one hundred feet above the level of the sea.

After it became known to the inhabitants that we were aware of the existence of Copper in the island, I was informed that there are several other places, which I had not seen, situated near the village of Garen, where there are also the remains of smelting-places, said to have been built by the Faringhees; but as my excursions were over, the survey of the Island of Maseera completed, and we were about to weigh anchor to

take up a station on the opposite coast, I had not an opportunity of visiting them.

The specimens accompanying this Report have been collected from the *debris* of the decomposing metalliferous rocks which the veins traverse, and will serve to shew in what form the Copper occurs in the volcanic rocks of Maseera; but the richness or poorness of the veins themselves, lower down, in the undecomposed part, must be ascertained by a more extended examination than it was then in my power to accomplish. Of this I feel satisfied, that there are many others of the same mineral which I did not see, many also undiscovered, and that there is a vast quantity of Copper Ore scattered through the *Trap Rocks* of Maseera. That these mines at some time or other were, considered worth working, is proved by the presence of the remains of old smelting-places in the vicinity of the veins, but with what profit, is probably now unknown.

The Island of Maseera is inhabited by the Janabah tribe, a cognate tribe of the Beni-Bo-Ali, and a few families of the tribe of Hakiman, who people the islands in Gubat Hashish. At first they were much opposed to our landing, and threatened to murder the first boat's crew that came on shore; subsequently, however, Hamud, Shaykh of Soor, came down for the purpose of mediating between his uncle Mohamed bin Mohamed, Shaykh of the Janabah tribe, and ourselves, and after a reconciliation had taken place, the steadiness and kindness of treatment every member of the tribe received, won for us their good opinion, and our departure from the island was as much regretted by its inhabitants, as our arrival had been considered hostile and unwelcome.

So willing were the inhabitants to supply all our wants, after the object of our visit was thoroughly understood; so great is their confidence in our pecuniary transactions with them; and so much more are they given to habits of industry than the Bedwins of the mainland, that if any desire of the Government to work these Copper mines was intimated to them, I feel convinced that they would hail the proposition with delight, as holding out a prospect of amelioration which, from the barrenness of their island and their extreme poverty, they could expect from no other source.

The channel between Maseera and the mainland, though difficult to navigate, is safe, offers good anchorage and plenty of water. It would appear by the information obtained from the inhabitants, that having anchored there, you could not work out during the south-west monsoon, but

could remain as safe as during the north-east monsoon, when there is hardly a ripple there to disturb the surface of the water.

There is excellent fresh water to be obtained from shallow wells on the inner side of the island, but provisions of all kinds, excepting fish, are scanty from the barrenness of its soil.

*Report on Lithographic Limestone from the South-east
Coast of Arabia.*

As we approach the south-western half of Kuria Muria Bay, on running down the south-eastern Coast of Arabia from the N. E., a Limestone formation of great magnitude makes its appearance in the form of mountains near the sea, backed by table land, (a less disturbed part of the formation), elevated about four thousand feet. From the Bay of Kuria Muria this highland is continued on with trifling interruptions here and there, of valleys and passes, to the Fudhaylee mountains, a little to the north-east of Aden. In its composition are found limestone strata of various degrees of purity, passing from pure compact fine-grained limestone above, breaking with a conchoidal fracture, downwards into coarse micaceous sand-stone. It is near the village of Marbât towards the upper part of its series, that I observed a stratum possessing the character and properties of Lithographic Limestone, and from which I gathered the specimens I have now the honor to forward. One of them has been ground down by Dr. Buist, whose report on its genuine character, and its commercial value, I beg leave to annex to my own ; and to prove its identity with that used for lithographic purposes, a design has been transferred to it, from which the accompanying impressions have been taken, that, in forwarding the specimens, satisfactory evidence might at the same time be given of what can be produced from them.

The stratum composed of this stone, is from three to four miles inland (varying with the distance of the highland from the shore), close to the summit or edge of the table-land above the village of Marbât ; from whence there is a descent towards the sea, sometimes gradual, sometimes precipitous, so that blocks loosened from the top, could with little trouble, be rolled down to the water's edge, where they might be immediately shipped ; there is also a running stream of fresh water on the spot. As however the stratum must be continued on, and the mountains are equally near the sea for some distance on both sides, there might even be a still

more convenient position for quarrying the stone than that above Marbāt; at all events this would offer an advantage in the selection of material.

The people who inhabit the highland, where the lithographic stone is to be found, are the Beni Gara; they are fierce and revengeful, but if properly treated, are easily managed; and though they would not submit to be employed as quarrymen, yet they would be quite ready to enter into any engagement to protect others from being attacked by the more predatory part of their tribe. At the same time each Beit or family, of the Gara tribe, possessing its distinct and particular portion of the district they inhabit, and being exclusively entitled to its peculiar produce, it would simplify the matter much, to treat with that family only from whose land the stone might be required to be taken; this could not be done, however, without the concurrence and the aid of the Arab (not Bedwin) Shaykhs and merchants of the neighbourhood, who, under the idea of participating in the gain, would be quite willing to smooth the way for the introduction of any commercial scheme. Before however proceeding in the matter, it would be advisable to ascertain more satisfactorily what quantity of Lithographic Limestone the stratum is capable of yielding, as well as its average uniformity of texture; points, which from such investigations generally being considered of so little consequence compared with the main object of the survey, I had neither time nor means afforded me to determine.

Bombay; }
November 30th, 1846. }

H. J. CARTER.
Assist. Surgeon.

ARTICLE VIII. *Notice of Dr. Roth's investigations of the Vedas.* By the Rev. J. M. MITCHELL.

Some recent researches into the literature and history of the Vedas, conducted by a German Orientalist, Dr. Rudolph Roth, have been productive of results sufficiently interesting and important to claim the attentive consideration of our Society. These results have been communicated to the public in a volume, of 180 pages 8vo. entitled

Zur Litteratur und Geschichte des Weda. Drei Abhandlungen, von Rudolph Roth, Doctor der Philosophie. Stuttgart, 1846.

A special interest attaches itself to the Vedas at present, from the

fact that the Court of Directors is understood to have come forward in patronage of an edition of the Rig Veda, which is to be edited in Sanskrit by a German Scholar, Dr. M. Müller, with a translation into English by Professor Wilson. Independently of this, however, Dr. Roth's contributions to Oriental investigation would be most welcome to all who take an intelligent interest in the history of the human race, and in the unsealing of a book which is unquestionably one of the most remarkable of its records.

Dr. Roth seems carefully to have examined the MSS. of the Vedas that are deposited in the library of the East India House, London, the Bodleian library at Oxford, and the Bibliothèque Royale at Paris.

The following is a condensed statement of the results to which his inquiries have conducted him.

The Vedas are properly five in number,—the *Rik*, the *Sáma*, the *White Yajus*, the *Black Yajus*, and the *Atharva*. A Veda consists properly of two perfectly distinct parts, the first being collections of hymns, the second liturgical treatises. The first part is called *Sanhitá*; the second, *Bráhmaṇa*. These two parts are probably not of the same age,—the hymns being more ancient than the liturgical treatises. Among the five Vedic books denominated *Sanhitá*, there are, however, only four collections of hymns. The fifth, the *Taittiriya Sanhitá* (or the so-called hymns of the *Black Yajus*), is a liturgical work.

Among the four collections of hymns, the *Rik* is the most extensive, amounting to nearly 11,000 verses. The *Atharva* hymns are nearly as numerous; those of the *Vájasaneya* (or *White Yajus*) may amount to half as many as those of the *Atharva*, and those of the *Sáma* to one fourth of those of the *Atharva*. The hymns of all the four Vedas taken together may amount to about 30,000 verses.*

But, as Colebrooke has remarked, the hymns of one Veda are often repeated in one or more of the others. Nearly the entire *Sáma* is in the *Rik*. About half the *Yajus* is in the *Rik*. Roth speaks doubtfully respecting the *Atharva*, of which he has been able to consult only an indifferent copy, but conjectures that one-third of it is in the *Rik*.

* In the *Jahrsbericht der Deutschen Morgenlandischen Gesellschaft* for 1845 and 1846, the numbers are thus stated on Roth's authority; *Rik*, 10,500 double verses; *Atharva*, about 8,000; *Vájasaneya*, considerably fewer; *Sáma*, about half of the *Vájasaneya*.

The usual division of the *Rik* may be called purely mechanical. It is into 8 equal parts (*ashtaka*), each *ashtaka* being divided into 8 sections (*adháya*), and each *adháya* into *varga* of 5 verses each. This arrangement appears to have been adopted simply to facilitate reference to the Veda in schools. The true division is into 10 *mandala* (books), consisting of *anuváka* (chapters), which are again divided into *sukta* (hymns) and *rik* (verses).

The disposition of the parts of the *mandala* depends partly on ritual reasons, partly on similarity of subject ; — for example, invocations of Agni generally come first, then of Indra, and so on.

We may specifically designate the *Rik* as the *historical* Veda. The collection of its sacred hymns is an astonishing work, and proves the existence of a scientific development of mind among the Hindús at a date long anterior to that when the Homeric poems were brought together. More than one thousand hymns are here before us, in which the ancient inhabitants of the Panjáb implored blessings on themselves and their herds, saluted the glowing East, sang the combat of the lightning-darting god with the dark night, and rendered thanks to the celestial powers, which had dispensed to them, as they believed, succour amid their battles.*

* Such, very nearly, is our author's animated description. It will be seen that he contemplates these ancient hymns in a purely literary point of view. It is however interesting and useful to examine them in another light ; and when we do so, we are compelled to form a far less favourable estimate of their character. It is true, that the general absence of *anthropomorphism* from the Vedic notion of divine beings, necessarily excludes many of the worst outrages against morality that shock us in the Puránas, in which the worship of deified heroes and gods assimilated to men, plays so important a part. Still even in this respect the Vedas are faulty ; and in the character of the sacred Rishis—particularly as these are represented in the commentaries on the Vedas—there is much that is morally repulsive. A dialogue is given in which Yama endeavours to seduce his twin-sister Yamuná. The Rishi Vasishtha is assailed by the house-dog, when about to steal grain. See Colebrooke, *Asiat. Res.* vol viii. p. 401 402. The warlike and revengeful character of the Rishis will be afterwards noticed. Gross indelicacy (such as in Rosen's *Rig Veda* p. 214, 215,) is too common to attract much notice. More portentous is the passage from the *Vrihad Aranyaka* quoted by Colebrooke *ut supra* p. 440.

Enthusiastic antiquarians like our author sometimes dislike such remarks as these. But, even were we permitted to waive the claims of religion and morality, a purely literary estimate of the Vedic hymns would be chargeable with that one-sidedness which the Germans generally pride themselves on shunning.

It must not be supposed, however, that the hymns of this Veda are exclusively religious. A hymn in the 7th *mandala* (noticed briefly by Colebrooke) describes in jocular language the revival of the frogs at the commencement of the rains, and compares their croaking to the singing of the Bráhmans in worship. In the 10th *mandala* we have the lamentation of a gamester over his ruinous devotion to play. Other instances might be adduced. Probably, those non-religious portions belong to a later period.

The *Rik* professes to give the hymns in the complete form in which they were *seen* by the Rishis. Not so the *Sáma* and *Yajus*, the liturgical purpose of which has materially affected their contents. In the *Sáma*, the metre has had much influence; similarity of sound even, appears frequently to have affected the succession of verses.

The undoubted fact that the hymns of the *Sáma* and *Yajus* form part of the *Rik* does not prove that the contents of the *Rik* were first *collected*. Probably, those that were required in worship, viz. those of the *Sáma* and *Yajus* were first brought together. The collecting of the *Rik* hymns depended on other and more scientific grounds. We may even presume that science, as usual, may have overdone her task; and, instead of transmitting the ancient hymns in an unaltered form, may have tried to improve upon them, and so given us a *rifacciamento* (*ueberarbeitung*). Still, we see no cause for holding that the collectors of the *Rik* tampered with the old hymns in any thing essential.

The *Atharva* does not present us with single unconnected verses, but with complete hymns, the order of which is determined by their subjects. In this respect it resembles the *Rik*. Indeed, it may be called a supplement to the *Rik*,—a supplement which aimed at comprising the religious hymns of a period, when the *mantra* was no longer the expression of direct religious feeling, but had degenerated into a kind of charm or magical formula. This Veda, then, consists mainly of texts intended to protect against the hostility of divinities, against sickness, against wild beasts, &c. it contains curses against enemies, invocations of healing herbs, and prayers for aid in the occurrences of ordinary life, for safety in travelling, success in play, and so forth. In the passages common to the *Rik* and *Atharva*, the latter introduces many capricious inversions and alterations. In the portions peculiar to the *Atharva*, the Sanskrit approaches to the flowing diction of a later age, although the forms of the

words still remain archaic. A remarkable fact in the relation of the *Rik* and *Atharva* is, that the *Rik* towards the end (10th *mandala*, last chapter) contains many sections decidedly bearing the character of *Atharva* hymns, and actually found to be contained in the *Atharva*.

Many additional proofs might be adduced to shew not only the more recent collection of the *Atharva*, but also its more recent composition.

A very interesting section in Dr. Roth's treatise is on the *historical element in the Rig Veda*. He presents us with the text and a translation of various portions of the *Rik*, relating to the celebrated *Rishis Vis'wámitra* and *Vas'ishta*. From these passages he thinks he is able to deduce important historical facts. They relate to a great struggle which is represented as carried on by the ancient chief families on the banks of the *Yáska*, which Roth identifies with the *Hydraotes* in the *Panjab*. He holds it to be established by the *Rik* that the ancient Hindú families resided farther to the northwest than we find them in the later books, and nearer the *Indus* than the *Yamuná*. The *Sindhu* or *Indus* is often mentioned, and highly celebrated; in the *Rik* hymns, it is termed, for example, *apasám apastamá*, the most copious of streams,—whereas, Roth has found the *Ganges* only once referred to, and then, with no special commendation. The remaining rivers of the *Panjab* can also be clearly made out.

We find the ancient families which are accounted holy in the later Indian books, represented in those early poems as actively engaged in strife and war. Races, which, at the remote period referred to, possessed a common habitation, a common speech, and a common creed with those holy families, were afterwards widely separated from them in all respects. The religion that was born on the banks of the five rivers, was reared into a stupendous system in more southern lands; and the Brahmanic people applied the appellation of barbarians to those tribes which they had left behind, and which received a different development from themselves. The ancient songs breathing strife and slaughter were succeeded, in the fertile plains of the south and south-east, by sacrificial hymns and prayers; the gods too changed: and the once chivalrous race, courting ease and abandoning itself to superstitious dreams, retained no trace, except in a rigid asceticism, of that dauntless and energetic spirit by which, in days of old, it had been so remarkably distinguished.

Among the Vedic *Rishis*, *Vas'ishta* was farthest to the south-west,

and already possessed the region that subsequently came to be regarded as the holy land. *Vis'wámitra* was farther to the north-east, and in the tract which was afterwards held to be barbarous. *Vas'ishta*, in whom the lineaments of the future Brahman are discernible, was in subsequent times exalted above his warlike compeer. *Vas'ishta* is the priestly hero of the new order of things. *Vis'wámitra* is the last representative of the warrior-shepherds of the Panjáb.

Such would seem to be the general historical import of that great contest between the two Vedic families, the memory of which is preserved in the books of all succeeding times.

An interesting portion of Dr. Roth's treatise is occupied with statements relative to three Grammatical treatises, which he has been the first to bring to light. These are termed *Prátis'ákhya Sūtrāni*, i. e. Grammatical aphorisms belonging to each school. These works treat of the elementary part of Vedic Grammar, particularly the grammar of the *Rik* accent, *sandhi*, lengthening of vowels, pronunciation, & c. To these books Roth is disposed to ascribe a high antiquity. A passage in the ancient grammatical work called the *Nirukta*, proves that they are more ancient than Yáska, and consequently than Panini, the father, as he is often called, of Sanskrit Grammar. Supposing Panini to have flourished about 300 years before the Christian era, the *Prátis'ákhya* sutras now brought to light cannot be of later origin than between 450-400 B. C. These books again, however, frequently refer to still older grammatical treatises, and these we must suppose not more recent than from 500 to 450 years B. C. The collection of the Veda itself cannot well have been later, according to Roth, than the 7th century B. C.*

In the preceding remarks, I have contented myself with being simply the expositor of the views of Roth. The subject is so recondite, that few even of those who have paid attention to Sanskrit literature, can, without presumption, attempt to discharge the higher task of the critic. It appears, however, sufficiently plain that the results at which this zealous Scholar has already arrived, possess what our German friends would call an *objective validity* sufficient to excite the highest hopes regarding the services which he will render to Oriental literature, should his researches be continued in the spirit in which they have been commenced. Even already, although he has by no means equalled Colebrooke in ad-

* *Jarsbericht der Deutschen Morgenlandischen Gesellschaft.* p. 36.

ditions made to previously existing knowledge, and although the Essay on the Vedas of that profound and accurate Orientalist is at this moment by far the best exposition of those works, yet it must be admitted that Roth has brought forward not a little new and important matter.

Besides the treatise which has formed the subject of this notice, Roth has published an article on "Brahmá and the Brahmans," in the *Zeitschrift der Deutschen Morgenlandischen Gesellschaft*, Heft I. 1846, which, if it is not at all times perhaps convincing, is throughout most interesting.

Along with thorough-going German research, our author seems to possess an almost *Jonesian* ardour and imaginativeness. He is thus able to impart no small degree of fascination to his views. In his hands the old Vedic hymns, which lie withered and sapless in our collections, like the constituents of a *hortus siccus*, seem to burst afresh into life, and resume whatever of grace or fragrance they originally possessed; so that, when we consider them in a merely literary point of view, we are free to confess that among these faded leaves there lie, potentially, charms we could little have suspected. Many however will, we trust, approach the Vedas with yet other feelings; and, recognizing in them the most authentic and complete memorial of the human mind's early aberrations from primeval truth, will contemplate them in a far higher than merely esthetical point of view, and be enabled to deduce from those monuments "covered with the hoar of innumerable ages," lessons, which the human race, in all succeeding times, and throughout all lands, will do well to ponder and lay seriously to heart.

ARTICLE IX.—*Correction of the Girnar Asoka Inscription.*

By Captain LEGRAND JACOB. Belguain, 3rd March, 1845.

SIR,—I do myself the pleasure to send you a Table of corrections of sundry errors in the Lithographed copy of the Girnár Asoká Páli Edict, published in No. V. of the Society's Journal. My own copy may possibly be defective but it may help to aid any revised translation that may be attempted of this very ancient Inscription.

Girnar Asoka's Inscription.

Table of Corrections of sundry errors in the Lithographed Copy of the Girnar Asoka's Inscription published in No. V of the Bombay Asiatic Journal 1843. — By Capt. LeGrand Jacob.

1st Division.

4 th line	2 ^d letter for 1	read 6	3 ^d letter for 7	read 2
8 th .	1 st — for 3	—	3	
10 th .	5 th — for 5	—	5	
11 th .	5 th — for 3	—	3	10 th — for 5
12 th .	last — for 3	—	3	5 th letter read or 16 th letter for 5 read 7

2^d Division.

1 st line	2 ^d letter for	read	8
2 ^d —	18 ^h — for	—	1 st read 1
4 ^h —	3 ^d — for	—	10 ^h — for 18 ^h let. for 8 read 5
5 ^h —	8 ^h — for	—	1
6 ^h —	20 ^h — for	—	7
8 ^h —	24 ^h — for	—	4

3^d Division.

1 st line	20 ^h letter for	read	8
2 ^d —	3 ^d — for	—	12 ^h letter for 8 read 5
3 ^d —	23 ^d — for	—	0
4 ^h —	6 ^h — for	—	23 ^d — for 1
5 ^h —	7 ^h — for	—	9 ^h — for 8 read 5

4th Division.

7th line 5th letter for H read K²⁷

2d. — 15h. — for { —

$\frac{1}{2} - \frac{1}{4} = \frac{1}{4}$

5^h - 3^d - for h³⁰ - A 12^h. letter for I³¹ read E

b. The "answer" should follow the 1st letter and not be below the 2^d.

8th Line 14th letter for ^{32.} Read X

9⁷ — 8⁴ — for D — D —

10^h - 1st - for omit, -^{5th} for red -

11h. — 4h. — for —

D^o. — 26th — for omitted ver. 23.

19th. 18th. 45. for I read 7

A. The first omitted letter counted.

36.
for K read K
36.
read ~~the~~ last letter

5th Division.

4th line 13th letter for ^{47.} ~~Y~~ read ~~Y~~ 16th letter for ^{48.} ~~Y~~ read ~~Y~~ 46th letter for ^{49.} ~~Y~~ read ~~Y~~

5th — 2^d — for ^{50.} ~~D~~ — 18th — for ^{51.} ~~E~~ — ~~E~~

6th — 2^d — for ^{52.} ~~F~~ — 3^d — for ^{53.} ~~F~~ — ~~F~~

7th — 25th — for ^{54.} ~~K~~ — ~~K~~

8th — 15th — for ^{55.} ~~H~~ — ~~H~~

9th — 5th — for ^{56.} ~~G~~ — ~~G~~

6th Division.

1st line 14th letter for ^{57.} ~~Y~~ read ~~Y~~ 4th letter for ^{58.} ~~E~~ read ~~E~~ 11th letter for ^{59.} ~~F~~ read ~~F~~

2^d — 4th — for ^{60.} ~~L~~ — ~~L~~

4th — 1st — for ^{61.} ~~K~~ — 28th — for ^{62.} ~~L~~ — ~~L~~

9th — 2^d — for ^{63.} ~~L~~ — 22^d — for ^{64.} ~~J~~ — ~~J~~

^{65.} 10th line 23^d letter for  read  26th letter for  read 
 11th — 20 — for  — 
 13 — 24 — for  — 

8th Division.

1st line 31st letter for  read 
 2^d — 23^d — for  —  26th letter for  read  35th letter for  read 
 5th — 10th — for  — 

9th Division.
 1st line 14th letter for  read  30th letter for  read 
 6th — 35th — for  ^{76th init} after read 
 7th — 22^d — for  read 
 9th — last — for  

10th Division.

B the two erased letters not counted.

B. ¹⁹
1st line 29 letters for A read A
3^d — 16th — for C — C
4th — 10th — for 7 — 7

11th Division.

²¹
2^d line 16th letter for E read E

12th Division.

¹²
4th line 39 letters for D read D
6th — 18th — for } — S
9th — 10th — for 8 — 8

²⁶
3^d line 6th letter for T read T 9th letter for L read L

13th Division.

58. C. 59. C.
1st line 1st letter for omits read ~~the~~ 1st letter for read X C. The first omitted letter counted
N.B. The note to the 28th letter X of this line has by mistake been given in the
lithograph below the following line.

8th line 10th letter for ^{90.} read ^{91.} 13th letter for ^{91.} read ^{92.} 20th letter for ^{92.} read

NB The notes to the 8th line have been inserted incorrectly, this line therefore is here given in full.

8th line J L E U \$ ^{space for two initials} T P Y R J L D C T S E I A Z X P V A T P G H ^{E.E.G.}

In the 11th line / 3^d Division, for the lithographed note to the blank space

In the 11th line 13th Division, for the lithographed note to the blank space for
"perhaps it", read "perhaps 1 but extremely doubtful."

D. G. - all but, if not utterly impossible very faint trace apparently unevenness of rock of I

E. Very doubtful if there be an upper stroke to constitute a λ

F. Doubtful if dotted line be fracture or letter, the vowel, i, being the most likely portion.

G. h, impossible, n, quite plain.

H. "ga" rather than "ta", "ya" impossible.

14th Division.

2^d live last letter for A read A.

4th — 24th — for O — O.

5th — 19th — for O — O.

/ Signed / C.L. Jacob.

H. 10/11

ARTICLE X.—*Some Remarks on the Relation that subsists between the Jain and Brahmanical systems of Geography.*

By the Rev. J. Stevenson. D. D.

Before entering on the immediate subject of this paper, a few remarks require to be made upon the illustrative maps appended. I have to acknowledge my obligations for those necessary appendages, to a pupil of the Elphinstone College, Vasudeva Bapu, and to Bombay Lithography, which has not allowed his labour and skill to prove abortive. The maps were ordered to be drawn according to the Bhagavat, and in relation to the first I need not here make any remark. The difficulty all lay in the execution of the second. Jambudwipa and the Salt sea, the subject of the first map, is comparatively a known world, having some limits, but the remaining Dwipas and seas almost set reason at defiance. The whole diameter of a great circle of the earth is 50 crores of Yojanas, or four thousand millions of miles. The diameter of the seven Dwipas amounts to little more than a tenth of this. The Lokaloka mountains, at the extreme limits of the earth, are said to have a width equal to one fourth of the whole, or 12 crores and 50 thousand Yojanas. The distance from Meru, in the centre, to the circular mountains Manasottara, in the last belt of land, is found by computation to be 57 lakhs and 50 thousand, and this is said to be the extent of the Suvarna Bhumi, *land of gold*, used for a play ground by the gods. The radius of Jambudwipa is half a lakh; the width of the Salt sea one lakh of Yojanas; the next continent is two lakhs in width; the west sea is the same; the next continent is double of that, and so on; giving us as follows:

Radius of the circle embracing the 7 Dwipas	2,53,50,000
Extent of the golden land	1,57,50,000
Extent of Lokaloka	12,50,00,000
	<hr/> 16,61,00,000
Subtract this from radius of the whole, viz.	25,00,00,000
And we have a remainder of	8,39,00,000

Leaving a belt of eight crores and 39 lacks of Yojanas unaccounted for. What then was to be done with this? Why, the best thing that

could occur to a school boy was done, and the excess was thrown up to the play ground, at the expense however of increasing it to five times the size assigned in the Puran. In the Vishnu Puran, the boundary chain of mountains is only 10 thousand Yojanas wide, but the whole extent is stated to be the same as in the Bhagavat. Professor Wilson supposes this total was intended to embrace also the planetary spheres.

The central region of the earth, it will be seen, is supposed to be occupied by the solid circle of land called Jambudwipa, the diameter of which is said to be a hundred thousand Yojanas, divided mostly by tranverse chains of mountains, into nine great Divisions or *Varshas*. The Salt sea, a belt of water a hundred thousand Yojana wide, surrounds all this central continent, and is encircled by *Plakshas Dwipa*, a band of land twice its width, and which by transverse ranges of mountains is separated into seven *Varshas*. This continent is surrounded by the sea of sugar of the same width, and it again encircled by *Salmali Dwipa*. In the same manner, and increasing in the same ratio, follow the sea of ardent spirits, *Kusadwipa*; the sea of melted butter, *Kraunchadwipa*; the sea of milk, *Sakadwipa*; the sea of cream, *Puskaradwipa*; and the fresh water sea. The last mentioned continent, however, instead of being divided by transverse chains into seven parts as the rest, is divided by a circular mountain chain, called *Manasottara*, into two equal parts. Then follow the golden land and the boundary chain called *Lokaloka*, of which we have already spoken.

Instead of seven continents, the Jains acknowledge only three, and the outer part of the last being uninhabited, the two others and a holy continent with them, mean the habitable earth. The sea around *Jambudwipa* is a salt water band of twice its diameter, or two hundred thousand Yojanas. Dhataki, the next band of land, has a width of twice this extent, and the fresh water sea by which it is encircled, is twice that again, while Puskara is double of that, or 16 lakhs. This system is much simpler than the Brahmanical, and is evidently the original from which the other was formed, though the observations on which it was modeled, seem to have embraced little more than the knowledge that the Ganges and Indus ran into the sea, and that there were mountains and vast collections of fresh water to the north of the Himalayas. The Peninsula must have been wholly unknown, or the fabricators could never have made the line of coast, from the mouths of the Indus to those of the Ganges, the arc of a circle a hundred thousand Yojanas in diameter.

In reference to more minute particulars, both parties agree as to the position and heights of Meru, rising a hundred thousand Yojanas from its base, though of these 16 are under the earth's surface. This funnel-shaped central mountain is 16 thousand Yojanas in circumference at its base, and 32 at its summit. * On the top of Meru the Brahmins have placed the city of Brahma, while the Jains assign this site to the abode of Lakshmi, goddess of good luck, the Latin *Fortuna*. The great chains which divide Jambudwipa, are the same in position with Brahmins and Jains, only that the Jains interpose between us and Himavat the range called Waitadhya, or the white mountains, from behind which the sun is seen to rise. The chain on the north of Meru, which corresponds to the Himavat on the south, is called Sikhari, a name given also to Mount Parisnath. These two mountains are both of a light yellow colour, and send out at each extremity two lotus-leaf shaped promontaries, extending more than half way through the Salt sea, so that in all, we have eight of these projections. The two next chains, one on the north and the other on the south, corresponding to the Hemakuta and Sweta Parvata of the Purans, are called by the Jains Mahimavat and Suvarna Kuta, being respectively of a white and golden colour. The northern and southern Nishada, the former painted green and the latter red, and corresponding to the Nishada and Nila of our map, form the last pair of parallel ranges of mountains, running east and west. The central portion of Jambudwipa is divided by the Brahmins, as shewn on the map, into three sections. To these the Jains add two more, drawing lines from the extremities of the southern, till they meet the northern Nishada. These segments they call the eastern and western Máha-Vidrehas. In the angles of Ilavrita, called by them Devakuru and Uttarakuru, the Jains place four enormous tusk-shaped mountains, that on the southeast being yellow, that on the south-west green, that on the north-west white, and that on the north east red; near these also the four trees are situated which they, as well as the Brahmins, suppose to rise to immense height in these regions. The districts of Bhadrāsna and Ketumala they call Vijaya and Uttarardha Vijaya. These are divided by transverse ranges into thirty-two parts. Sixteen districts of Vijaya lie on the east, and sixteen on the west of Meru, and the districts of Uttarardha Vijaya lie to the south and north of these, and come in contact on both sides with the Nishada mountain. These 64 portions of

* By mistake the accompanying map gives but half these number.

land are divided from one another by alternately blue and red mountains. The smaller divisions of Jambudwipa amount in all to 190, of which though six belong to Bharat Khanda, or the region south of the Himalayas, only one, the district between the Indus and Ganges, is inhabited by men acquainted with true religion. The others are the abode of Mlechchas, men who do not follow the religious system of the Jains. The two rivers take their rise from the Himavat, not from Meru as on our map. The Jains place a lake on the top of each of the mountainous chains in its centre, from which have their source two rivers, one running eastward on the south of the mountains, and another westward on the north. The two rivers that run from the Nishadas to the central regions, pass through five additional lakes, after the manner of the St. Lawrence, till they approach Meru, when they take a bend, and pass perpendicularly down through the centre of the Vijayas. The river that flows from the top of the Himavat to the east, divides itself into two portions, forming the eastern and western sides of a spherical triangle, of which the Salt sea forms the base. The district of Airavartta, on the opposite side of Jambudwipa, corresponds in most particulars with Bharat Khanda. Its capital city is Prabhasa, while that of Bharat Khanda is Ayodhya. These are the only two districts that are subject to periodical destructions and renovations. They form the chief abode of human beings, though the Vijayas also are inhabited by men, and have four *Tirthankaras*, divine sages, living in them at present. The central portion of the earth around them, and the two immense plains to the south and north of the Nishada mountains, on either side of Meru, and contained between the longitudinal ranges of mountains above described, are inhabited by Hermaphrodites, called by the Jains, *Yugals*. The height of those in the central regions is three * *garas*, in the next division two, and in that nearest the abode of man, one. It is from these *Yugals* that the population of the earth is renewed after a periodic destruction; for by residence in our locality, and eating the fruit it produces, they become men. In their own territories the period of gestation is 79 days, 64 days, and 49, respectively. The parent dies immediately on the birth of a young *Yugala*. These persons are not the subjects of virtue and vice; they enjoy the reward of merits in a former state, which deserve nothing superior. Towards the four points of the com.

A *garas* varies from 5 to 9 miles.

pass in the Salt sea, there are four cavities of the shape of a large water jar, descending a hundred thousand Yojanas ; these are called Patala Khand, and form so many hells. The diameter of Jambudwipa is rated at a hundred thousand Yojanas, as is done by the Brahmans, but, as the Jains have only two seas and three continents, it was necessary to maintain their ground in the race of absurd exaggeration, begun with the Brahmans, to have a second Yojana, which they make 1,600 Kos, making the diameter of Jambudwipa 320 millions of miles. The width of the Salt sea encircling it, is double that amount ; Dhataki Khanda, the next continent abelt, is double that again ; the freshwater sea double that ; and the last continent, Pushkara Dwipa, is double that, or 16 lakhs of sacred Yojanas, making the diameter of the whole terrestrial circle little short of two thousand millions of miles, just however one half of the computations of the Bhagavat. As the Bhagavat is the latest of all the Purans, the same total was likely formed without any regard to the different items, to get beyond the Jains, as they by the innovation of the sacred Yojana had got before the ancient Brahmans. Immense however as these figures are, the earth in which we live and the system to which we belong, is but one of an infinite number of Chakravali, which occupy space. The Jains, having no infinite deity or soul of the world, like the Brahmans, satisfy the aspirations of the human mind, as far as such systems can satisfy, by an infinite universe. Their geographical scheme was at first apparently not very complicated, and such as might satisfy the unscientific minds of those in Upper India, who had heard of a Salt sea to the south, and of mountains and vast fresh water lakes to the north of the Himalayas ; but it is vain to look into their books for any definite information relative to any distant locality, though patient research might, from this source, throw some light on the internal Geography of India.

ART. XI.—*Desiderata, relative to Thibet and Central Asia, in a series of questions, proposed by the Bombay Branch Asiatic Society, to the Members of the Embassy proceeding to the Frontiers of Chinese Tartary.*

On the following communication, from the Foreign Secretary to the Government of India, being received by the Bombay Branch Asiatic Society,

a draft of *desiderata*, relative to Thibet and Central Asia, was made and ordered to be forwarded to Mr. Elliot, in reply to his letter; of which a copy was also communicated to the Bombay Geographical Society, with a request to know if its Members had any questions to propose to the Mission. The reply from the Secretary of the Geographical Society, containing suggestions on certain points, to which the attention of Members of the Mission might be usefully directed, was accompanied by a letter from Mr. Chambers of Edinburgh. The latter, in reference to a paper on *ancient Beaches*, read by him at the Oxford Meeting of the British Association, sought for further information and facts, on the relative leve's of sea and land over large portions of the Globe, similar to those from which his deductions had been made. The Bombay Society, at its Monthly Meeting of the 9th September 1847, resolved that both these communications should be forwarded to Mr. Elliot; and the *desiderata*, or notes of information supplied for the use of the Thibet Mission, are here published with a view that they may be serviceable to the researches of future travellers.

Simla, July 8th, 1847.

DEAR SIR,—As a Mission is about to start to the frontier of Chinese Tartary, I shall be glad to learn if there is any question of literary or scientific interest, which you would wish its Members to make the subject of their investigation.

A Barometer and a few Magnetical and other Philosophical Instruments accompany the Mission, which will consist of Captain Cunningham, Dr. T. Thompson, and Lieutenant Strachey; and to such careful and intelligent observers may safely be entrusted any enquiry your learned Society may wish them to prosecute.

I remain,

To

*The Secretary of the
Branch Asiatic Society,
Bombay.*

Dear Sir,

Your most obedient Servant,

(Signed) H. M. ELLIOT,
Foreign Secy. to the Govt. of India.

The letter from the Foreign Secretary to the Government of India, now submitted to the Society, not informing us of the proposed route by which Captain Cunningham and the Mission intend to visit the frontiers of Chinese Tartary, a letter has been accordingly written to Mr. Elliot, requesting he will kindly intimate the line of route likely to be followed.

In order to prevent delay, and in anticipation of Mr. Elliot's reply, the following draft of a series of questions, on the *Orography*, *Hydrography*, *Ethnology*, and *Archæology* of Central Asia, can be forwarded to the Members of the Mission. The Society have reason to gratefully acknowledge this flattering reference made to it by order of the Governor General, and ought cheerfully to respond to this call by sending a catalogue of *desiderata*, on various points of investigation, relative to a portion of the earth now little known, but of great interest; such being connected, as Humbolt observes, with ideas of an extraordinary configuration of the surface, and being as it were the cradle of those primitive races of mankind, which have successively overspread and barbarized Europe.

The Mission may follow either the *Western* or *Eastern* route to the frontiers of Chinese Tartary; but many of the objects deserving of attention, and requiring investigation, would of course be somewhat different, according as its Members selected one or the other. If the former, Captain Cunningham will proceed I suppose from Kashmir to Lei or Ladak, and thence going along the banks of the river *Shayuk*, or northern branch of the Indus, will pass the *Karakorum* mountains, to Yarghien or Yarkand, Kashgar, and *Ili* or *Gulja*, the now Head Quarters of the Chinese Military Government, to which are subject the Mahomedan cities of Yarkand, Kashgar, Yengi-Hissar, Aksu, Ili, Ooch-Tur-fan, Koneh-Tur-fan, (or Hami), Gummi, and Lop. If he intends to pursue the latter, he will penetrate into Eastern Thibet, by the pass of *Tuklakoot*, on the eastern side of Kailas, or will follow the route already traversed by Turner, from the northeast frontier of Bengal, by way of Muri-chom, Tassisudon, and Dakka Je-ung, to Teshoo-Loomboo and Lhasa, the residence of the Grand Lama.

Under the supposition that either route may be taken, the following are some of the questions which the Society propose as subjects of research for Members of the Mission.

OROGRAPHY AND HYDROGRAPHY.

I.

What is the geognostical structure and highest elevation of the *Kuen-lun* mountain range, which separates Thibet from the western portion of Chinese Tartary, including the territories of Yarkand and Kashgar?

The Karakorum mountains, from which the Shayuk river has its source, form part of the Kuenlun range, and give origin also, on the opposite or northern declivity, to the rivers Karakash, and Yarang-Kash. These being joined by the *Serakol* river, of which a large branch flows from the *Karakol* lake, in the Bolor Tagh cross range of mountains, become then the river of Yarkand; which, after receiving two chief streams from Khoten, disembogues itself, on the eastward, in lake Lop, considered in the time of Marco Polo to be within the limits of Eastern Turkistan. The intermediate desert, from Kashgar to lake Lop, appears to have been anciently occupied by the *Yaghar-Ghoz*, a tribe of Turkish Nomades, frequently mentioned by the Arab Geographers, and who became early acquainted with the use of letters and the *Aigure* Alphabet, which is now generally used both among the *Turkish* and *Mon-golian tribes*. This country, formerly designated on the maps as *Little Bukharia*, and more correctly known as *Eastern Turkistan*, is now, without much attention to accuracy or the origin of its tribes, and simply from having become subject of late years to the Chinese Empire, reckoned part of Chinese Tartary.

II.

What is the breadth and elevation of the Bolor Tagh mountain range, from southwest to northeast, at that part forming the water-shed between the *Sir-i-kol* lake, or sources of the Oxus westward, and the *Kara-kol* lake eastward, which gives origin to the northern branch of the Yarkand river?

The Bolor Tagh, according to Humbolt, is that mountain range parallel to the Meridian, extending from $32\frac{1}{2}^{\circ}$ north to 45° , which intersects the Himalaya, the Kuenlun, and the Tien-shan, to the parallel of $45\frac{1}{2}^{\circ}$ north, and to the extent of nearly 780 miles. The culminating points of the Bolor, which is composed of a number of chains nearly parallel, are supposed to exceed 18,000 feet, and are situated between 35° and 40° north. Lieutenant Wood, who reached the Sir-i-kol lake on the 19th of February 1838, places it in $37^{\circ} 27'$ north, and $73^{\circ} 40'$ east, and estimates its elevation to be 15,600 feet; above which the surrounding mountains, covered with perpetual snow, rose 3,500 feet.

III.

What are the names of the passes, and nature of the roads running across the Bolor Tagh mountains?

Three great passes are supposed to cross this mountain range. The two most northerly are those to Kashgar. One of them, in 1557, was described to Jenkinson as a journey of 41 days from Bokhara, by way of Tash-kand and Khojend, along the banks of the Sihon, or Jaxartes. The same route appears to have been followed, in A. D. 1780, by a Russian Officer named Czernechef, who went from Khojend to Kokan, Merghilan, Chihal-situn or Takhti-Suliman, (now called Oosh,) by some lead mines and the entrance of the plains eastward, to Kashgar. Meer Izzet Ullah, in returning from Kashgar to Kokan, reversed this route, having followed west by north for 98 hours the course of the Kashgar river, (*or northern branch of the Yaman-Yar,*) which has its source at Koksú, near the pass called *Darwaza Dawan Tezek*, or valley gate of Tezek. Westward of this are the streams which unite to form the *Sir* or *Sihon*. Meer Izzet Ullah describes the road, leading from the top of this pass, to be at first west by south in a narrow valley, and then along the skirts of the mountain Tezek to the town of *Irchelak*, for a distance of 16 hours. From Irchelak a road is said to run south 3 or 4 days journey to the Sir-i-kol or northern branch of the Yarkand river.

The second pass to Kashgar follows the course of the Oxus, and is the same as that called in Mr. Elphinstone's *Kabul* the pass of Chiltung: from which two roads, to the left and right, lead respectively to Kashgar and Yarkand. Instead therefore of three passes by which the traveller is conducted across the Bolor Tagh mountains, or rather the *plateau of Pamir*, there are more correctly speaking only two; of which the first, along the Oxus, was taken by Marco Polo, and the latter by Goetz (A. D. 1603). This has been more recently traced in part, by Lieutenant Wood of the Indian Navy, who, in his journey to the sources of the Oxus, describes the road, from the latitude of Issar $37^{\circ} 02' 10''$ north, as running along the stream of the Oxus by the Darah or valley of the Sir-i-kol, which is divided, at Issar, from the Daráh of Mastuch, conducting the traveller into the district of Chitral.

Marco Polo proceeded from Balkh to Taikan or Tailkan, thence ascended the mountain region of Balashan (Badakshan;) appears to have

crossed the Tokeba or river of Faizabad, and to have then followed the course of the Oxus to the elevated plain of Pamir; across which he journeyed for 12 days, before arriving at the region of Beloro, (Belor-Tagh), consisting of vast mountains with intermediate valleys; and thence, proceeded to Kashgar and Yarkand. Goetz also travelled for 20 days in a narrow track, overhanging the Oxus, before arriving at Sarchil, (Sarikol); and from thence went in two days to that part of the mountains covered with perpetual snow. He was then six days in crossing the southern portion of the plateau of Pamir, and was twenty days more in travelling to Yarkand by a very bad road. The Geography of these parts requires further elucidation as to the number of passes which lead in various directions. We have also as yet only approximations of the mean height of the *plateaux* of Ladak and the three Thibets.

IV.

What is the nature and length of the road said to lead across the mountains which separate the district of Rodokh, in Nari or Western Thibet, from the district of Khoten in Eastern Turkistan?

Thibet is the vast and mountainous tract of country between 73° and 98° east longitude, from Greenwich, and 27° $38'$ north latitude, inclusive of Beltistan (or Little Thibet,) to the frontier of China eastward, where its southeast boundary is little known, and is supposed to be inhabited by numerous Nomade hordes, speaking corrupt dialects of the Thibetan language. Nari, or Western Thibet, has, through the investigations of Gerard, Moorcroft, and others, become more familiar to us, though there be much still in this part of the country for the investigation of travellers. An extensive trade was formerly carried on between Khoten, (now Elchi,) and Hindoostan; and a royal road from Gardokh and Rodokh, in the eastern part of Nari, is said to have led to Khoten and other districts of Eastern Turkistan; but the present state of the route, and the direction of the mountains over which it passes, are worthy the attention of the Mission, as being little known at present, Humbolt thinks that the water-shed, which here, to the eastward of the sacred lakes *Manasa* and *Rawana-hrada*, separates the sources of the Indus, the Sutlej, and the Dzungbo-tchou, is nearly 79° $35'$ of east longitude from Paris, and in north latitude about 31° $56'$. It must be considerably more to the eastward, however, as this is nearly the correct

position of the high ridge, which, running from northeast to southwest, separates the vallies of the Indus and Sutlej.

V.

What is the highest elevation of the Kantesi or Kailas peak of the Himalaya range, which gives origin to the branches of the Sinh-khabab river, or southeast branch of the Indus, and divides its source from those of the Sutlej, and the Yaroo Sanpoo river, supposed to have its source in the same lofty mountain range?

The peak called in Thibetan *Tesé*, and *Kailasa* in Sanskrit, situated about 81° east longitude and 31° north latitude, is supposed to be the mutual boundary of Western and Middle Thibet, the last of which is generally called *Pot* and *U-tsang*, the capitals of which are *Lhasa* and *Zhikatse*. Eastern Thibet or *Kham-yul*, is bounded on the north by the countries of the Turks and Mongols, called by the Thibetans *Hor* and *Sokpo*. The greater number of the tribes inhabiting this part of Thibet, seem more nearly allied to the Mongolian than the Turkish races of men. The determination of this question as to the highest elevation of the Kailasa peak, with the elevation and direction also of other mountain ranges, which divide Thibet into various districts, is a subject requiring elucidation.

VI.

Is the Yaroo Sanpoo, the great river of Southeastern Thibet, the same as the Irawaddi or Ava river, as supposed by D'Anville and Klaproth; or is it the Brahmaputra, according to the opinion of Major Rennell?

Humbolt expresses himself doubtingly of the indentification of the Yaroo Sanpoo, or Dzangbo-tchou, with the Brahmaputra; and though the probabilities seem to be in favor of Major Rennell's opinion, as opposed to that of Klaproth, the subject of this question is a yet undecided point.

VII.

What are the traces of ancient Volcanic revolutions throughout the region of Central Asia, and are the fossil bones of the elephant and rhinoceros found here as in Siberia?

Three eminent Russian Mathematicians, Messrs. Tuss, Savitch, and Sabler, have, by independent trigonometrical levellings, determined

the long pending geographical question of the *depression* of the Caspian, which is now ascertained to be only 83, 6 English feet below the level of the Black Sea and Mediterranean. This seems rather unfavorable to the soundness of Humbolt's opinion, that this inland sea may be considered, in a Geological point of view, as a great *Crater*, connected with the volcanic elevation of the plateau of Persia, and the chain of Hindukush; if not with the up-heavement of that which is vaguely and incorrectly named the plateau of Central Asia. We are but slightly informed of the state of *ancient volcanoes*, and others lately in a state of activity, which have been met with in this great country; and the tracts of volcanic territory, including the mountains of Peshan, Houtcheou, Ouroumptsi, Kobok, and Aral-toube, and others not yet brought to notice, require to be better described and known.

VIII.

Do the rivers or mountains of Thibet furnish gold, and what are the other mineral productions of the country?

In Western Thibet, the mountains near *Gardokh*, or *Gortope*, are said to be rich in gold and mineral matter; and the sandy beds of several of the rivers of the country are known to contain grains of gold, which is also said to be disseminated, and in masses, through the *quartz* and other rocks of this country. Mines of lead, iron, and copper, are also said to occur, along with mines of mercury, the ore being cinnabar: all of which subjects will of course claim the attention of the Mission.

IX.

Does any great river flow out of lake Manasarowar?

Geographers are yet sceptical of the result of Mr. Moorcroft's examination of this lake, that no streams of any consequence, and none whatever on the northern, western, or southern sides, issue out of *Manasarowar*. Further evidence is wanting to decide the correctness of Moorcroft's opinion.

X.

Is there a mountain chain on the Northern frontier of Eastern Thibet, running parallel to the Yaroo Sanpoo river; or are the mountains in this

quarter detached groups, admitting the highland of Eastern Thibet to pass gradually into the plateau and desert of Central Asia, possessed by the Kalmuks and Monguls?

The country, on the north and east, intervening between Thibet and the edge of the great sandy desert of *Shamo* and *Kobi*, is only known to us by vague report. From the prevalence however of lakes in these tracts, and the reputed origin of rivers of magnitude, such as the Hoang-Ho, which finds its way to the Eastern sea, there is reason to believe that a bifurcation of the Kuenlun range takes place far to the East, running along the southern edge of the desert, and that a hilly tract of country divides Thibet from the Great Desert.

XI.

If there be a mountain chain on the Northern frontier of Thibet, is it a continuation of the Kuenlun range, or an extension of the Kantesi and Kailasa peaks of the Himalaya?

This question naturally follows from the former, with a view that a definite account of the system of mountain ranges, in these parts, may be obtained for Geography: for our present maps of the country are characterized by a blissful ignorance of this matter, and Humbolt distinguishes the tract as *Terra Incognita*.

ETHNOLOGY AND ARCHAEOLOGY.

XII.

What are the differencies of Ethnological physical character and features between the Thibetan tribes of Ladak and Lhassa, and is there any reason for believing that the people of Nari, or Western Thibet, belong to the Turkish race, or that the Thibetans proper, and Bhutias, are of the Mongulian family?

The Thibetans appear, as far as we may learn from their language and history, to be of mixed origin. The Western, or those of Ladak, are the descendants of the *Yeutchi*, *Indo-Scythians*, or *Sakas*, incorporated with the Turkish tribes of the *Hioung-Nou*; and the Eastern Thibetans, or those of *U-tsang* and *K'ham-yul*, are said to have sprung from the *Khiang*, a yet wandering horde of savages in the fourth century of the Christian era; who, on being united with the *Thoufsan* about A. D.

632, became an united people, and on adopting the *Bauddha* religion with its Sanskrit literature, soon after became conspicuous among the nations of Central Asia. If this opinion of the mixed origin of the Thibetans be true, it will probably be supported by the affinities of the Thibetan language being found cognate with the dialects of Turkistan and Kashmir, an opinion by the way which has in some measure received the sanction of Professor Horace Wilson. Such affinities can, however, only be looked for from a comparison of the *Jaghatai Turki* with the several dialects of Thibet.

XIII.

In what respect does the *Jaghatai Turki*, spoken at Yarkand and Kashgar, differ from the modern dialect of the same language now in use at Constantinople?

The modern *Osmanli*, spoken at Constantinople, is a very mixed dialect, which has adopted many Arabic and Persian words, with a large proportion also of Greek and Italian; while the *Jaghatai Turki*, in use among the *Usbeks* and the tribes of Khwarism, is a more pure and original language, of which the grammatical peculiarities and affinities have not, as far as I know, been made the subject of investigation by any modern Philologist. The *Jaghatai Literature* is said to be rich in works of Historical interest; of which those best known to us are the important histories of the Mongols by Rashid-ad din, and of Jhengiz Khan by the Wazir Ala-ad-din; taken it is said from earlier Annals, written in the language of the Onigours.

XIV.

What are the affinities of the Thibetan dialects, spoken by the *Brok-pa*, or *Hor-pa*, (remnants of supposed ancient Turkish tribes, living in the deserts north west of Lhassa) with the dialects of the two Turkish tribes of *Usbek* and *Khirkis*?

A more extensive comparison than has yet been made of these dialects is requisite before an opinion can be formed of how far Thibetan, and particularly its Western dialects, have any cognate affinities with the Turkish language.

XV.

Is there any good foundation for the opinion of Klaproth that the

Usbeks are the remains of the Ouigours or Aigures? And is there any tradition among them as to the period when the Ouigour alphabet, (known to be of Syrian origin,) was adopted by them?

According to Remusat and Klaproth the most ancient Turkish people, of which history makes mention, are the Hiong-nou, who possessed the original country of the Mongols, and were the ancestors of all the Turkish tribes. Among these the *Thou-khiou*, or Turks of the Altai, having obtained the superiority, and founded a vast Empire, about A. D. 552, assumed the national designation of *Thou-men*, from their first successful leader, who took to himself the title of *Il-khan*, or as written in Greek letters, on that series of coins belonging to him, *Aloukeno*, an apparent-Syriac title derived from *Aloho deity* — and *Kahin*, priest or diviner. It is just possible that the latter part of the word *keno* may be meant for the Tartar word *Ken* or *Kan*, signifying the sun; and this supposition becomes more probable from our finding, on the reverse of these coins, the word *AOH loeh*, with symbols of the fire worship; which seems to be either the *Anamese* word *lua* signifying fire, or the Thibetan *La* or *Lawa*, the appellation for the moon. The coins to which reference is here made will be found in Prinsep's Journal vol. v. pl. ii, fig. 17 and pl. xlvii, fig. 12. The *Il-khan Thou-men* was succeeded by his son *Iski-khan*, who transmitted his kingdom to his brother, called by the Chinese *Ti-theou-pou-li Khan*, who reigned under the title of *Mou-kan Khan*, and is called by the Byzantine Authors *Diza-boul*, to whom Justin the II, in A. D. 569, sent his Ambassador Zemarkh. From this embassy we become acquainted with the fact of this nation of Turks having, at this early period, adopted the Ouigour Alphabet, in which were written the letters of congratulation to the Emperor, who had them explained to him, from the Scythian language and writing, by means of an Interpreter. (*Corpus Scriptorum Historiæ Byzantinæ e excerpta e Menandri Historia fol. 296*). The whole of the Indo-Scythian coins, bearing the name of *Kenorano*, belong in all probability to this very *Mou-kan Khan*, called *Ken-khan* by the Persian Historians of the Turks. The *Thou-men* Turks, being occupied with constant wars with the powerful Chinese dynasty of *Thang*, became greatly weakened and divided among themselves, so as to give the *Si-yan-tho* and the *Hoei-he* an opportunity of completely destroying their power about A. D. 744, and of founding a new Empire on their ruin. The language of the latter has

been declared to be the Oriental Turkish, or Jaghatai dialect, spoken in the greatest purity by the Usbeks, who appear to be the descendants of *Hoei-he*, and to have established themselves as Nomades in *Khiva*, *Ferghana*, and *Kokan*, about the beginning of the sixteenth century.

XVI.

On the Indo-Scythian Coins of *Kenorano* there are apparently corrupted Syrian titles written in Greek letters, and as the Nestorians had established themselves at *Merv-Shah-jehan* in A. D. 410, and had penetrated into Tartary so early as A. D. 636, is there reason for supposing that the *Thou-men Turks* obtained the Ouigour alphabet from these Christian sectaries along with the name of Ouigour?

The appellation Ouigour is by the Persians more correctly written *ایغور*, *Aighur* or *Ighur*; and has like the alphabet I think a Syriac or Nestorian origin.—This will probably be found in the Hebrew *Agur*, which Gesenius thinks may, like the word *Kohemoth*, signify one of the assembly of wise men; a most appropriate appellation certainly for those who had introduced a knowledge of letters and writing among the rude savage tribes of Turkish and Tartar Nomades. This derivation too seems more probable, as the Chaldee *Igarath* signifies a Royal epistle or edict, sent by a public Courier and the same word *nummated* in Persian *انگاره* *Angarah*, signifying a narrative of facts or journal.

XVII.

Does the language of Thibet approach in Syntax and Grammatical form the dialects of the Mongol hordes, and of others inhabiting the country and belonging to the Indo-Chinese race; or does this language constitute a distinct class from either the Turkish, Mongol, or Chinese branches?

XVIII.

At what period of the Christian era did the *Sangayanas*, or Buddha Missions, from India to Thibet and Eastern Turkistan, carry with them into these countries the Prakrit alphabet of the Indian Cave Temples, along with the religion and literature of the people who formed them?

The Chronicle of Thibet relates that the Bauddha religion was introduced into that country A. D. 60, and that some of the most important Missions from India which established the national belief, took place in A. D. 225. Monsieur Remusat has endeavoured to shew that though this may be generally true of the people of Nari or Western Thibet, Ladak, and Eastern Turkistan, it is not so of the greater part of the nation, particularly the inhabitants of the eastern districts of Thibet, who remained in a state of ignorance till the beginning of the seventh century of our era, when the principles of Buddhism, eliminated and discussed in Sanskrit, appear to have been introduced from India.

XIX.

When was the religion of Bhuddha introduced into the district of Khoten, north of the *Kuenlun*; and what is the present state of the priests and followers of this faith, who are said to be numerous in that country?

M. Abul Remusat acquaints us with the important discovery that the language spoken at *Khoten*, before the Christian era, was *Sanskrit*, or at least *Prakrit*, a colloquial dialect of that learned tongue, and called *Fan* in the Chinese historical accounts. It was at least a dialect of the Arian family of languages, spoken by the *Sacæ* of *Casia* or Kashgar, and of *Bylta* or *Little Thibet*. The known existence of a colloquial medium of intercourse belonging to the Sanskrit class of languages tends to confirm *Masudi's* narrative, that *Naosherwan* the Great, after having killed the king *Akhshawan*, carried into Persia the original of the *Kalila Damna*. It has been already said, in the previous question, that the Bauddha religion was introduced into the country about A. D. 60; but there is reason to believe that the alphabet in which the Thibetan dialect was then written, a modification doubtless of the Indian-Cave alphabet, had been used in these countries at least 60 years B. C.

XX.

If there be any ancient books of the Bauddha religion met with in Khoten, what are the language and character in which they are written?

XXI.

Are there any works of value, written in the *Ouigour* alphabet or in *Jaghatai Turki*, relative to the history of the country to be met with in Eastern Turkistan ?

XXII.

Are there any sculptured stones or inscriptions in an unknown character and of supposed ancient date, to be met with in the countries of Thibet and Eastern Turkistan ?

XXIII.

Do any ancient *tumuli*, like the topes of Afghanistan and the Panjaub exist in these countries, and have any instruments of iron, or vessels of gold and silver ever been found in them ?

Since the draft of these questions was drawn up, another communication has been received from Mr. Elliot informing the Society that the precise route, taken by the Mission from India, will be along the upper part of the valley of the Sutlej near its origin; on which they will come after passing by the *Niti Ghat*, over the high southern ranges of the Himalaya mountains, at an elevation of 14,544 feet above the level of the Ocean, and about the 31st degree of north latitude and 80° of east longitude from Greenwich. They will then proceed across the Sutlej valley to the junction of its eastern branch (the river of Lan-zing) with the *Spiti* river, which is here flowing from the northward; and will thence proceed by the *Panj kang* lake to the pass of the Karakorum mountains, over which a road leads to Yarkand; or they will follow the pass across the mountains from Rodokh to Khoten, where they are desired to winter, if possible; but if not so, they are to remain at Rodokh, on this side of the *Kuenlun*, or go on to Yarkand on the other. As soon as the season will admit of travelling, Captain Cunningham is to explore the course of the Indus to *Gilghit*, and thence through the *Terra Incognita* of the *Dardu* country; and Lieut. Strachey will pass on through the district eastward of the *Sin-kha-bab* river, or eastern branch of the Indus to Gardokh and the *Manasarawa* lake, to which place he penetrated last year from *Kamaon* over the Himalayas. He may then follow the route into Eastern Thibet by the *La Ganskiel* pass, and is directed to explore

from thence the course of the *Sanpu*, ascertaining whether it be the river of *Ava*, or the *Dihung*, which falls into the *Bramahputra*. Dr. Thompson is to investigate all the mineral treasures of our northern frontier. They are provided with Barometers, Thermometers, Sextants, Altitude and Azimuth Circles, Magnetical Instruments, and with whatever is in fact necessary for the extension of Geographical knowledge and the domain of science. The Members are prohibited from going into Independent Tartary, in order to prevent the possibility of any of those accidents befalling to the Mission, such as have already happened to those who preceded them in the field of exploration. The following may be proposed as general questions.

GENERAL QUESTIONS.

XXIV.

What is the present state of the trade between Kashmir and Yarkand? and what is the annual amount of the *Ambar* or pure silver, the wool of the shawl goat, tea, and silk, brought in exchange for shawls, white piece goods and leather?

XXV.

What is the Revenue of Khoten, and the state of the traffic between it and Yarkand?

A considerable annual amount of Mahomedan prayer silk clothes, satin paper, gold dust, raisins, and other things, are exported to Yarkand for copper-pots and leather.

XXVI.

Is there any export of broad cloth, brocades and copper, to the frontiers of China, or to the *Khanate* of *Kokan*, in return for tea, China ware, rhubarb, and salammoniac?

XXVII.

What is the present amount of the transit trade of Eastern Thibet, by the *La Gaushiel pass*, to Ladak and the Panjaub.

Large quantities of impure borax, shawl wool, gold and silver, are said to be brought by this route from China and Thibet.

ART. XII.—*Biographical Memoir of the late Major General Vans Kennedy.*—By JAMES BIRD, Esq.

The late Major General Vans Kennedy was the scion of an ancient family long resident in Ayrshire in Scotland, and connected with the noble house of Cassilis (or Ailsa), a branch generally admitted to be the chief of the race of Kennedy's, who came originally from Carrick, of which they afterwards were the Earls. Many of his family greatly distinguished themselves in the early wars both of France and Scotland, where they obtained high honors. The subject of the present memoir therefore naturally and proudly thought that "no ignoble blood flowed in his veins," and would occasionally say that "one would rather be the child of some body than of no body". He was well pleased also to remember that he was of a stock connected on his father's side, with the Earls of Eglintoun and Dumfries, and on his mother's side, with the Marquis of Annandale; and that while three descents in the days of Chivalry made a gentleman, he himself could number seven till his distinct genealogy became lost among the Lairds of Bargany.

The General's immediate progenitors, though less noble, were not however less respectable than the more remote part of his ancestry. His grandfather, a younger brother of the House of Bennan, a man of high character, made a considerable fortune by the sale of cattle, which were bred by himself, and by assisting country gentlemen in the management of their affairs. Through this he was enabled to purchase the estate of Pinmore in Ayrshire, which he left to his eldest son Mr. Kennedy, the father of the General and of Miss Grace Kennedy the Authoress of *Dunallan*, *Father Clement*, and other deservedly popular works.

Mr. Kennedy, to whom the estate of Pinmore descended and the father of the two children mentioned, who were destined to attain celebrity in the literary world, was himself a man of considerable talent, acquirements, and brilliant conversation, but of peculiarly retired habits, and of great negligence in his affairs; his wife was Miss Vans Agnew, the eldest daughter of John Vans of Barnbarrock, in the county of Wigton, who, having married his cousin the heiress of Agnew, became

the representative of that family and assumed its name. Mrs. Kennedy, remarkable for general information and for sincere and genuine piety, lived in the utmost seclusion at Pinmore, until she had become the mother of ten children, five sons and five daughters. Soon after this, Mr. Kennedy's affairs becoming embarrassed by the failure of the Ayr Bank, he was obliged to sell his property and move with his family to the vicinity of Edinburgh, where he resided until his death, which took place in the year 1790, leaving his admirable wife with the responsible charge of her five sons, three of whom were afterwards educated to professions in which they appear to have given promise of future eminence, but died early, a fourth died when a child, and Vans, the youngest, was left (the representative of the family) with five sisters, who afterwards evinced intellectual superiority by various publications.

Two years previous to Mr. Kennedy's removal to Edinburgh, his son Vans was born (1784), and after having been educated in the Edinburgh classes, was sent when twelve years of age to England, where he attended Dr. Duprè's Academy at Berkhamstead, along with his cousins, the sons of Robert Vans Agnew. Here he soon gave proofs of his studious disposition and ready apprehension, and having been soon after removed to Dr. Powell's establishment at Monmouth, made such rapid progress in his studies there, that Dr. Powell told his uncle he would be happy if he had an usher in his school so well qualified as young Kennedy. So much at this time was he attached to books and yet so indolently disposed, that Dr. Powell had great difficulty in making him join his companions at play to take the exercise necessary for preserving his health; still, though in general averse to join in the recreations of the other boys, he would sometimes exert himself in performing feats of strength, which however, were accomplished so awkwardly that they frequently excited the ridicule of his companions. Naturally of studious habits with an irritable temper he was not generally liked, though a favorite with many by whom he was found warm-hearted and amusing. The desire of distinction through the acquirement of languages formed his ruling passion, so much so that even his holidays were devoted to attaining a proficiency in French and Italian, and having but little facility in pronunciation for acquiring the colloquial parts, his chief attention was directed to their grammatical construction and philological peculiarities.

On the completion of his fourteenth year, having hopes of an appointment for India, he returned to Edinburgh to spend the last twelve months of his stay in Britain with his mother and sisters. While with them, he still continued zealously to prosecute his studies, and having through the influence of Mrs. Crawford Bruce, (a lady much attached to his mother) obtained a cadetship, he sailed for Bombay in 1800, where, on his arrival, he immediately entered upon the distinguished literary career destined for him to pursue. Soon after reaching Bombay he was employed with his Corps, (the 1st Battalion 2nd Grenadiers) in a campaign against the people of Malabar and Cottiate, where he was wounded in the neck, and ever afterwards suffered from the effects of that injury. The nature of the service in which he was then engaged and the want of books prevented his following the natural bent of his inclinations to the extent that he wished, but unfavorably even as he was then situated, he continued to devote his leisure hours to the study of the languages and literature of the East and, as it appears, acquired a vernacular knowledge of *Malayálim*, the dialect of the province in which he was serving.

On returning from the Malabar Coast, Lieut. Kennedy was sent to the Dekhan, where in January 1807, he was appointed Persian Interpreter to Col. Wallace, then Commanding the Peshwa's Subsidiary Force at Seroor, and though little acquainted at this time with the *Persian* language, he soon acquired such a proficiency in reading it as well as *Arabic*, that he is said to have translated with wonderful fluency the Persian *Shikastah* letters, written to his Superior from the Native Courts and by the Jaghirdárs of the country. At this period, Col. Close, who was Political Agent at the Peshwa's Court and resided at the Sangam near Poona, was particularly fond of having Vans Kennedy at the Residency, and of discussing metaphysical questions with him. Lieut. Frissell, a nephew of Col. Wilks, another young man of much promise in those days, used to join in these colloquies. Sir James Mackintosh frequently spoke with the greatest respect of Col. Close's powers of argument, and of the ingenuity and indomitable hardihood of Kennedy. It is besides no insignificant testimony to Gen. (then Lieut.) Kennedy's talents and literary acquirements to state, that the Hon'ble Mountstuart Elphinstone who succeeded Col. Close, declared that at that time he knew no man with more varied and extensive

learning than the subject of the present memoir. He had not merely gleaned superficially from the authors he had studied, but had perused their works thoroughly and critically. He had read, for instance, all *Firdausi*, several of the *Puranas*, and many others works of antiquity. In study he was indeed indefatigable, and spared no expense on books, MSS. and Moonshis, while during the early part of his life he is said to have read for sixteen hours a day. He received no visitors and rarely went out, so that his presence in public was regarded with astonishment and curiosity. While he continued Persian Interpreter of the Seroor Subsidiary Force under four successive Commanding Officers, he was occasionally nominated to the duties of Deputy Judge Advocate General of Courts Martial assembled in the Dekhan.

Just preceding General (then Captain) Kennedy's appointment in 1817 to the Office of Judge Advocate General of the Bombay Army, in succession to Major Lewis, he became a member of the *Bombay Branch of the Royal Asiatic Society*, then the *Literary Society of Bombay*, when the well known Translator of the Emperor Baber's interesting Memoirs and the Author of other learned Essays, was the Secretary; and it is no mean proof of the estimation in which his abilities and extent of learning were then held by the members of the Society, to find, that at the Anniversary Meeting of that year he was unanimously elected one of its *Vice-Presidents*. About the same time he read at one of the Society's Meetings his "Essay on Persian Literature", which, though confessedly imperfect and of confined scope, gives a good general idea of the subject.

At the Society's Anniversary Meeting of 1819 Captain Kennedy took charge of the duties of Secretary, while by a most fortunate coincidence Mountstuart Elphinstone became its President. About this time the two first volumes of the Society's Transactions, (which have since become standard works in the literary institutions of Europe,) were published.

In 1825, Kennedy contributed several translations of the *Puranas* to the Quarterly Oriental Review, then published at Calcutta under the Editorship of the learned Director of the Royal Asiatic Society. The results of his labours in *Sanskrit* and other languages were published at home in 1828, under the title of "Researches into the Origin and Affinity of the Principal Languages of Europe and Asia"; and three years

after, his "Researches into the Nature and Affinity of Ancient and Hindu Mythology" appeared; it was the first publication of the kind derived from authentic and original resources. His reputation throughout Europe had now become established, and many subsequent contributions to periodical works both in India and England only confirmed the opinion already formed by the public, of the great extent and diversity of his knowledge. His oriental learning was profound and accurate, especially in the Sanskrit range, being particularly well read in the religion, philosophy, and law of the Mahommedans and Hindus, and that too in the writings of the *Vedanta School* pertaining to the latter. For the religion of the Parsis however, and the ancient books of that sect, he had no great respect. He often contributed to the *Asiatic Journal*, chiefly on subjects connected with Oriental Literature and to the Newspapers on matters regarding Military and Civil law. To the end of his days, he still kept up the character of a student, devoting his whole energy and thoughts to the study of Metaphysics and Philology, having, as he said, become tired of Theology, a subject to which in former days he had given much attention. He took a great interest in the prosperity of the Bombay Branch of the Royal Asiatic Society and was ever ready to volunteer his services for its support and improvement.

Those who were not intimately acquainted with General Vans Kennedy, would not conceive that under so cold an exterior, could exist such powerful feelings of affection and humanity as he possessed. Without the least regard to himself, he was ever ready to assist with all his might any one whom he believed to be the victim of injustice or oppression. He was careless of money and comfort, and was so liberal with what he had, that he was continually involved in pecuniary difficulties. At the same time he was most regular and punctual in his habits. Rising early, he first took exercise in his garden, then read the papers of the day and periodicals until breakfast time (about 8 A. M.); after this until dinner (about 4 P. M.) he engaged himself in his official duties and in attending to the more laborious part of his studies, devoting the evening to reading of a lighter character. His diet was abstinent and his hour of retirement early, and his health so good that he has been heard to say that he did not require to see a medical man for years together.

The duties of Judge Advocate General of the Bombay Army were

discharged by him up to the year 1835, when some misunderstanding having arisen between Sir John Keane and himself, he was removed from the appointment; but subsequently, on a Memorial to the Hon'ble the Court of Directors, was nominated Oriental Translator to Government, the duties of which Office he continued to perform up to the time of his death, which took place at his house in Bombay on the 29th of Dec. 1846. On the following morning his remains, attended to the grave by the principal people of this island, were interred in the European Burial Ground at Backbay with the Military Honors due to his rank.*

The following is a list of General Vans Kennedy's publications.

An Essay on Persian Literature.—*Transactions of the Lit. Society of Bombay*, Vol. II. 1819, London.

Remarks on the Chronology of Persian History previous to the conquest of Persia by Alexander the Great.—*Ditto*.

Notice respecting the Religion introduced into India by the Emperor Akbar.—*Ditto*.

Remarks on the State of Persia from the Arbela in A. C. 331 to the Rise of Ardeshir Babegan in A. D. 226.—*Ditto*, Vol. III.

Remarks on the 6th & 7th Chap. of Mill's History of British India, respecting the Religion and Manners of the Hindus.—*Ditto*.

Remarks on the Character of Muhammad.—*Ditto*.

A Dictionary of Maratha and English, and English and Maratha.—225 p. *Foolscap fol. Bombay*, 1824.

A Translation of the Legend of Jalandhara, 2 Parts.—*Quarterly Oriental Review*, Vol. IV. & V. 1825-26.

Researches into the Origin and Affinity of the principal Languages of Asia and Europe.—324 p. 4to. *London*, 1828.

An Abstract of Mohammedan Law.—*Journal R. A. S.* Vol. II. 1835.

Researches into the Nature and Affinity of Ancient and Hindoo Mythology.—494 p. 4to. *London*, 1831.

* See the Resolutions passed by the Bombay Branch of the Royal Asiatic Society on the occurrence of Major Gen. Kennedy's death, in this No. of the Journal. Art. XV.—*Extracts from the Proceedings &c.* for January 14th and February 4th 1847.

Remarks on the Vedanta System.—*Transactions of Royal Asiatic Society*, Vol. III. 1834.

A Treatise on the Principles and Practice of Military Law—378 p. 8vo. *Bombay*, 1832. 2nd & Revised Edi. 1847.

Five Letters on the Purans, with reference to the views of H. H. Wilson Esq.—*Asiatic Journal*, Vol. XXII. XXIII. & XXIV. 1834–40.

He is said also to have made a translation of the Diwan of Hafiz, but I believe it was never published.

*** For most of the facts on which the above sketch is founded I am indebted to Col. Ogilvie, and to C. J. Erskine Esq. C. S. whose father was an intimate friend of the deceased.

ATR XIII.—*Literary and Scientific Notices.*

The Society is indebted to the Editor of the *Journal of the Indian Archipelago* for Nos. 1 to 6 of that interesting Periodical. The Ethnology, Statistics, and Conchology of those interesting regions have met with able and laborious students in the contributors to this Journal. On the first of these subjects, besides some general remarks in No. 4, there is a long article in No. 5 chiefly devoted to a history of the manners and customs of a rude tribe in the interior, called the *Binuas*. While another of these tribes, the *Bermun* tribe, is perfectly atheistical, the *Binuas* are theists. The author hesitates as to whether their religious ideas are to be traced to the Hindus or Mahometans. If *Pirman*, the substitute for *Brahma*, the Supreme Being, were the only word where a connection could be discovered, we might remain undecided; but when we have *Devádewá*, intercessors and mediators between man and the Supreme, and *Bumi* the earth, also an inferior divinity,—names which are used every where among the Hindus to this day in the same sense essentially as among the theists,—all our hesitation ceases.

The article on the Statistics of the Dutch settlements ought to shame some of us nearer home in regard to the way this subject has been neglected among ourselves, and the article on the *Conchology* of a region so rich in treasures of this kind, must be read with interest by all who love to survey the shining wonders of the deep.

THE GERMAN ORIENTAL SOCIETY.

A Society was formed under the above-mentioned name (*Deutsche Morgenländische Gesellschaft*) in October, 1845. It is under the especial superintendence of Professors Roediger, Pott, Fleischer, and Brockhaus.

We are indebted to the courtesy of the Society for copies of the first Annual Report and the two first issues of their Journal.

The objects contemplated by this important Society are,

1. To collect MSS. and printed works, and productions of nature and art, connected with the East.
2. To publish, translate, and digest Oriental works.
3. To issue a periodical.
4. To support undertakings for extending our knowledge of the East.
5. To correspond with similar learned Societies and individuals.

The Journal of the Society (*Zeitschrift der Deutschen Morgenländischen Gesellschaft*) is to be issued four times a year. The well-known and valuable Journal edited by Prof. Lassen merges in the above, which is to enjoy the aid of the learned professor.

In the 1st No. of the *Zeitschrift*, we have a long article by Professor Ewald on a collection of Ethiopic MSS. sent by Dr. Krapf, several of which were hitherto unknown. This is followed by an article on "The nations and languages southward of Ethiopia", by the same distinguished scholar. Another long and interesting article is on "Brahma and the Brahmans", by Dr. R. Roth.

In the 2nd No. we have the commencement of an eloquent and powerfully-written article by Professor Neumann, of Munich, on "Sinologists and their works," commencing with Dr. Morrison, to whom warm, although not indiscriminating, praise is given. Dr. Pruner of Cairo contributes a lively "Aphoristic sketch" on "the Negro". We have next the "Plan of a Colonial Commercial Establishment in the East Indian Archipelago," by Dr. Selberg, the *practical* character of which took us rather by surprise, and for which the Editors half apologise, while yet they express their strong desire for Germany to have "a direct and enduring connexion with the East". Other articles of interest are given. The whole concludes with a number of literary notices; of which one of the most im

portant for us in Bombay, is an announcement that Dr. F. Spiegel, already well known as a Persian scholar, is employed on the Zendavesta, and a Grammar of the Pazend.

We have among the advertisements in the *Zeitschrift*, an announcement of the Mahábhárata being about to appear in "a complete critical translation," by Theodor Goldstücker. This will be an important contribution to Oriental literature.

We have been thus somewhat minute in our notice of the "Journal of the German Oriental Society", as we cannot doubt it will prove one of the most important means we possess of Oriental investigation. Germany has done much in this cause, and seems preparing to do more.

THE AMERICAN ORIENTAL SOCIETY.

We acknowledge with thanks the receipt of the 3rd No. of the Journal of this Society, which is for 1847. It contains a "Treatise on Arab Music", translated by the Rev. Eli Smith from a native work; "Notes on Arakan"; "Three chapters of Genesis in the Soahelee language, by the Rev. Dr. Krapf", with an introduction by W. W. Greenough; Reviews of Mons. Burnouf's *Introduction à l'histoire du Bouddhisme Indien*," and of Lassen's *Indische Alterthumskunde*, both by Prof. E. E. Salisbury, of Newhaven. Subjoined are various literary Notices, the most important of which is a Statement of the progress hitherto made in the decyphering of the Himyaritic Inscriptions, with the Alphabets proposed by Fresnel, Gesenius, and Roediger.

The "American Oriental Society" has sustained a great loss in the death of its late learned President, John Pickering Esq., of Boston; but we rejoice to see that it is still carried on with zeal and ability.

MEDICAL AND PHYSICAL SOCIETY OF BOMBAY.

No. VIII. of the *Transactions of the Medical and Physical Society of Bombay*.—In this No. we have observed some remarks by Assistant Surgeon Carter, on the Freshwater Sponges in the Tanks of Bombay. The Author states, that there are four distinct species to be met with; and after describing them specifically, alludes to their structure and animality.

In a subsequent communication to this Society, he observes, that in

his Notes published in the Journal to which we have alluded, he has con-founded two species under the head No. 2, and that the bright green colored species there mentioned, is distinguished from all the rest by having a crust of double pointed smooth spicula round its seed-like bodies. He supposes this to be *Spongia lacustris* (Lin.), *Spongilla friabilis* (Lam.).

Further, he observes respecting the animality of the Freshwater Sponges, that the animals of which they are but a congeries, are identical with the infusorium *Proteus*. 1st because they are composed of a semi-transparent gelatinous matter. 2nd because this gelatinous matter is endowed with the power of altering its shape and of locomotion. 3rd because in it are seen transparent cells (*contracting vesicles*) of various diameters from 1-9000th part of an inch to a mere point, (which he formerly supposed to be sphinctral orifices) dilating and contracting themselves as in other animalcules. And 4th because this gelatinous matter is provided with greenish yellow granules moving with, and especially characteristic of both the *Proteus* and the animal of the sponge.

He regards the *Proteus* as being more active in changing its shape, &c. than the animals of the sponge when first torn from each other, from the habits of the former having been vagrant perhaps from the commencement, and its full development thereby having been unimpeded, and states, that the *Proteus* feeds upon its like as well as upon other matter, enclosing its food within its own substance after the manner of the *Hydra*.

While examining the transparent border of a portion of sponge growing from the seed-like bodies, he has observed the contracting vesicles distinctly, and a little within this, the animals themselves distinguishable, though amassed together and ever changing their form, but he does not appear to have ever seen them enclose an object within their substance after the manner of the *Proteus*.

In the development of the contents of the Sphorangia or seed-like bodies, he observes, that when the latter are opened under water in a watch-glass the transparent cells within them having been eliminated, swell and burst by imbibition (*endosmose*) of that fluid; and that then the true ova of the Sponge with which they are filled, spread themselves over the surface of the vessel. Each ovum appears, not to be globular or ovoid as he formerly supposed, but discoidal, very much resembling

in size and appearance the globules of the blood, it being only when they are turned on their edges that they appear ovoid. The red spot in their centre he also now thinks to be an optical illusion, while he has every reason to believe that the ovum retains its planiform state until its transparent vesicles and granules have become developed and the power of locomotion in it fully established.

**ART. XIV.—*Report on the State of the Society's Museum*
1845.—By A. B. ORLEBAR, M. A., *Secretary of the Museum*
*Committee.***

The object of the following Report is to bring the state of the Museum before the notice of the public, for whose benefit the Society undertook to form it. It was originally instituted with the view that all classes might derive instruction from visiting it, and that all the Educational Establishments in this Island might share in its advantages; at the same time it was expected that all engaged in teaching, would join in supporting and improving it. That the Society's liberal design however, has not been generally understood is much to be feared, while it is hoped, that the present advanced state of its Museum when sufficiently made known, will prove that the laudable object for which it was instituted has not been disregarded, that it is attainable and that the collections only require to be a little increased and a little more attention given to their arrangement to render the Museum capable of affording all the information it was originally intended to convey.

During the past year the "Propositions" of 1840, relating to the Museum, have been steadily kept in view. They are the following;—

1st.—To make a general collection of such specimens in the various branches of Natural History, as would afford means of study to beginners and of comparison to students.

2nd.—To make such local collections from the Presidency and other places ordinarily visited by its residents as would fully exhibit the peculiarities in nature and art both of India and the neighbouring countries.

To effect the first purpose, the shells possessed by the Society were

arranged early in 1841 according to the system of Lammark; so that any person now by taking Lammark's *Histoire Naturelle* in hand, and comparing his descriptions with the labelled specimens, may obtain a knowledge of *Conchology* sufficiently accurate for any practical purpose.

During the past year, the collection of minerals generally has also been undergoing a systematic arrangement; the most difficult part has been accomplished, and had not the attention of your Secretary been drawn away to other parts of the Museum by the numerous donations made to it, it would have been completed some months back.

The Serpents, Fish, and Corals, as yet remain unarranged.

CONTRIBUTIONS TO THE MUSEUM.

Our collection of *Perim* fossils is very extensive, and although no additions have been made to it during the past year, yet there is no doubt, that if any member would apply himself to their examination, and arrangement, it would richly repay him for his trouble and end by inducing gentlemen who have the opportunity, to forward large supplies from the extensive fossiliferous deposits which we now know to be continued on far beyond that little Island.

Our collection of specimens from *Cutch* is still small.

Sindh has contributed several fossils during the past year, and this division forms the richest part of our collection.

Dr. Spilsbury, Dr. Malcolmson, and Dr. Bradley, have also made us rich in fossils from the extinct lakes of *Central India*.

Our collection of *Granitic*, *Trap* and other *Plutonian* rocks with their minerals from all parts of India is very great, and during the past year has been increased by some valuable specimens from the *Trap formations*.

In addition to collections from *India*, we have been forming others from *Egypt*, *Arabia*, and the *Persian Gulf*.

Small local collections of Shells from the mainland of India and from Bombay Harbour, the Red Sea, Aden, and Zanzibar, are also under formation. It is hoped that a marine *fauna* of all these localities may soon be completed, to afford both a study to Naturalists who may visit us, and a valuable source of instruction and useful relaxation to those whose duties may afterwards lead them to the places from which the collections have been made.

The Society has resolved to confine its *Zoological collection* to the skeletons and less perishable parts of animals, as the difficulty of preserving the more delicate tissues is now too great to be overcome in a satisfactory manner. It will notwithstanding be thankful for all donations, as it proposes to send presents to Societies out of India, with the hope of being able to effect exchanges which may be generally advantageous to the Museum.

The antiquities of India do not yet occupy much room in the Museum. But one very valuable illustration of a Religion, whose remains are of the deepest interest to the students of Indian History, now occupies one of our cases, viz. the donation from Sir H. Pottinger of a set of figures exhibiting the punishments in the *Buddh Tartarus*, faithfully copied from a Chinese temple belonging to that persuasion.

ART. XV.—*Extracts from the Proceedings of the Society.*

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 3d of July, 1845.

Read and approved the minutes of the last meeting.

The following gentleman was proposed as a member of the Society, to be balloted for at its next meeting, viz. The Rev. A. Fraser, by John Peet, Esq., seconded by the Secretary.

Read a letter from R. Clarke, Esq., Honorary Secretary, Royal Asiatic Society, acknowledging the receipt of the *Yacna, Visparad*, and Nos. 1, to 7. of the Society's Journal.

Read a letter from Dr. Thomas Hodgkin to Manockjee Cursetjee, Esq., relative to the establishment in London of the *Philological and Ethnological Societies*, for the purpose of investigating the physical character, history, and present condition of the different nations and tribes of the human race; and requesting the co-operation in this learned task, of all Societies and individuals in the East capable of collecting and diffusing the requisite information. Dr. Hodgkin remarks, that although much has been done by learned men in the East and by others in Europe for the investigation of Asiatic History, the tribes and languages are yet so numerous and the obscurity of the subject so great,

that much remains to be done, which can only be effected by able workers in the country where the necessary enquiries can be satisfactorily conducted. The letter further makes allusion to Dr. Stevenson's *Essay on the Language of the Aboriginal Hindus*, published in No. III of the Society's Journal, and recommends the continuation and extension of the same subjects relative to the various tribes of India.

The following donations were laid on the table :

TO THE LIBRARY.

By the Honorable the Court of Directors of the East India Company. Lieut. Col. Edward Sabine's *Magnetical and Meteorological Observations* for the years 1840, 1841 and 1842, made at the Observatory of Toronto in Canada.

The Secretary then submitted a paper entitled, "The travels of *Kumal-ad-din Abd-al-Rizak* from Persia to India in A. D. 1842," containing an account of the then flourishing city of *Bijunagar*. Translated from the Persian of the Author in the *Matlaa-as-Sadein* and illustrated with notes by James Bird, Esq.

Resolved that the thanks of the Society be given for the donation and paper presented.

Notice of the following motions to be brought before the next meeting of the Society was given.

1st.—That the London, Edinburgh, and Dublin Philosophical Magazines and the Literary Gazette discontinued by the Society, be re-ordered from Home.

2nd.—That the resolution relative to the payment of subscriptions by newly elected members of the Society, carried at the meetings of the 27th March and 24th April 1839 be abrogated, and that Art. XXV of the Society's Rules be acted on, in order to simplify the collection of subscriptions and the accounts of the Society.

The meeting was then adjourned to Thursday the 14th of Aug. 1845.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 14th of August 1845.

The minutes of the last meeting were read and approved of.

The Rev. A. Fraser proposed at the last meeting, having been balloted for, was unanimously elected a member of the Society.

Professor Harkness intimated, that E. Lyon, Esq. who was proposed a member of the Society, having become aware of circumstances which would compel him very shortly to return to England, begged to withdraw his name.

H. Conybeare, Esq., proposed as a subscriber to the Library by the Rev. G. Pigott, seconded by the Secretary, was admitted agreeably to the Regulations.

The following gentlemen were proposed as members to be ballotted for at the next meeting;—viz. Robert Burn, Esq., by John Smith, Esq. seconded by Dr. James Burnes, K. H., and H. Conybeare, Esq., proposed by Professor Harkness, seconded by Dr. James Burnes, K. H.

With reference to a note from Major General Kennedy, it was resolved, that directions be given to have the copies of the new Catalogue stitched and covered as originally ordered by General Kennedy, and that when ready they be forwarded to the Library, where they may be had on application to the Librarian, at Rs. 3½ each.

Proposed by Dr. James Burnes, K. H., seconded by P. W. LeGeyt, Esq. and unanimously carried:—

That the best thanks of the Society are due to Major General Vans Kennedy, for the ability and zeal with which he has so disinterestedly undertaken and executed the laborious task of preparing and carrying through the press, the Catalogue now on the Table.

The following donations were laid on the table.

TO THE LIBRARY.

A Dictionary of the Amharic Language in two parts, Amharic and English, and English and Amharic, by the Rev. C. W. Isenberg.—Presented by the Author.

A Grammar of the Amharic language, by the Rev. C. W. Isenberg. Presented by the Author.

Adumbratio Historiæ Mundi Amharice, or a sketch of universal history in the Amharic language, by the Rev. C. W. Isenberg.—Presented by the Author.

Regni Dei in terris Historia Amharice, or History of the kingdom of

God in the Amharic language, by the Rev. C. W. Isenberg.—Presented by the Author.

A Vocabulary of the Galla language, compiled by the Rev. J. L. Krapf.—Presented by the Author.

St. Matthew's Gospel in the Galla tongue, translated by the Rev. J. L. Krapf.—Presented by the Author.

By the Medical Board under sanction of the Honorable the Governor in Council.—A Report on Small-pox and Vaccination in Bengal, 1844; and Medical Topography of the Northern Hyderabad and Nagpore Divisions, the Tenasserim Provinces and the Eastern Settlements.

By the Asiatic Society of Bengal.—A Dictionary of the Technical Terms of the Sufies, edited in the Arabic original by Dr. Aloys Sprenger, of the Bengal Medical Service.

Presented through Professor Harkness.—Seven Inscriptions collected at Kolapur by Bal G. Shastree, Esq., who has added an English translation of one, and various explanations and remarks in regard to the others.

Presented by Professor Orlebar.—A paper on the Geology of the Egyptian Desert.

The Secretary was directed to forward the thanks of the Society, for the different donations and papers, and the meeting was adjourned to Thursday the 11th of September, 1845.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 11th of September, 1845.

The minutes of the last meeting were read and approved of.

Robert Burn, Esq., and H. Conybeare, Esq., proposed as members of the Society at the last meeting, were balloted for and duly elected.

Jaganath Sankarsett, Esq. was proposed as a resident member of the Society, by W. Howard Esq. seconded by P. W. LeGeyt, Esq.,

Read a letter from E. H. Townsend, Esq., Secretary to Government, accompanying a copy and translation of a list of Persian and Arabic Manuscripts at Bijapur; forwarded by Government for the information of the Society. In the collection are many rare works on Mahomedan Law, which are believed to be in a good state of preservation.

The following papers were read:—

1st. Notes on the Gara Tribe made during the survey of the south-east Coast of Arabia in 1844-45, by Assistant Surgeon H. J. Carter, of the Honorable Company's Surveying Brig *Palinurus*.

2nd. Extracts from a Journal kept during the survey of the Red Sea, by Capt. (then Lieutenant) Carless, I. N. Assistant Surveyor.

The thanks of the Society were unanimously voted to H. J. Carter, Esq., and to Capt. Carless for their interesting communications, which will appear in an early number of the Society's Journal.

The following donations were laid on the Table:

TO THE LIBRARY.

From Government.—Report of the Board of Education for the year 1844, three copies.

From the Chamber of Commerce.—Report of the Bombay Chamber of Commerce for the third quarter of 1844-45.

TO THE MUSEUM.

From Dr. Grierson, by Professor Orlebar,—some fossils collected in Sindh.

Thanks were ordered to be returned to the respective Donors, and the meeting was adjourned to Thursday the 9th of October, 1845.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 9th of October, 1845.

The minutes of the last meeting were read and approved of.

The ballot for the election of Jaganath Sankarsett, Esq. was unavoidably postponed, there being only eight members present, ten being required by the laws of the Society in all ballots for the election of members.

The following paper was read ;

By the Author.—*Memorandum* of the Great Comet of 1844-45, by William Pole, Esq., F. R. A. S., Professor of Civil Engineering in the Elphinstone College. The thanks of the Society were unanimously voted to the Author for his acceptable communication, which will appear in an early number of the Society's Journal.

The following donations were laid on the Table:

TO THE LIBRARY.

From the Author.—*Zeitschrift für die Kunde des Morgenlandes*, von Chr. Lassen, Phil. Dr. A. A. L. L. Mag.

From the Author.—*De Taprobane Insula Veteribus cognita Dissertatio*, by Chr. Lassen, Phil. &c.

From Col. Griffith.—Digest of the Reports made by the Commissioners into Charities.

From the Society for the promotion of knowledge through the medium of the Vernacular Languages.—Prospectus and Proceedings of the Society.

From Government.—Transactions of the Medical and Physical Society of Bombay for 1844.

Thanks were ordered to be returned to the respective Donors of the above presents and the meeting was adjourned to Monday the 24th of Nov. which being the Anniversary of the Society, the Office-bearers and Committee of Management for the ensuing year will then be elected—the latter by ballot, according to the rules of the Society.

At the Anniversary Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Monday the 24th of Nov. 1845.

The minutes of the last meeting were read and approved of.

Jaganath Sankarsett, Esq., a member of the Royal Asiatic Society of Great Britain, proposed at a former meeting to be a resident member of the Society, was balloted for and duly elected.

Assistant Surgeon Heffernan, H. M.'s 47th Regiment, proposed a subscriber to the Library by the Rev. G. Cook, seconded by the Secretary, was admitted agreeably to the Rules.

The Society then proceeded to the nomination of its Office-bearers, and a ballot being taken for the election of ten members of the Managing Committee, the following gentlemen were duly elected for the ensuing year, viz:—*Dr. Morehead, W. Howard, Esq., S. Dickinson, Esq., Professor Harkness, Captain H. B. Turner, Rev. G. Cook, J. L. Phillips, Esq., J. Peet, Esq., R. W. Crawford, Esq., and Captain H. B. Lynch.*

The President, Vice-Presidents and Secretary were continued in Office, agreeably to the rules of the Society.

R. W. Crawford, Esq., Captain H. B. Turner, Professor Orlebar, and the Secretary, were nominated a Committee to audit and report on the accounts of the Society. *

The following donations were laid on the Table ;

TO THE MUSEUM.

1st. From the President the Hon'ble J. H. Crawford.—A collection of Egyptian Relics and Geological Specimens, from the valley of the Nile and country in its neighbourhood.

2nd. Geological Specimens from the Southern Mahratta Country and Konkan.—By Lieutenant Suart of the Engineers.

3rd. Geological Specimens in illustration of the extinct lakes of India from the Gowel-Ghar Hills.—By Dr. Bradley.

4th. Fossil shells from Sindh.—By the Rev. G. Pigott.

5th. Shells from Johanna and Malwan Iron Ore.—By Dr. Grey.

6th. Coral from the African Coast. By R. X. Murphy, Esq.

7th. Specimens of fossil fish from Mount Lebanon.—By Major G. Jamieson.

TO THE LIBRARY.

1st. Report of the Superintendents of Roads and Tanks for the year 1843-44.—Presented by the Government.

2nd. The Hon'ble Mr. Justice Perry's Charge, delivered to the Grand Jury of Bombay, September the 25th, 1845.—By the Author.

Read a letter from Professor Chr. Lassen of Bonn, acknowledging the receipt of the Society's Journal (No. VIII), and thanking the Society for this acceptable and valuable gift.—The letter further noticed, and highly approved of the proceedings of the Society in collecting and publishing *Ancient Inscriptions* relative to India; such being the only authentic documents of information *on the former condition of it and the history of past times*.

Read a letter from Edwin Norris, Esq, Deputy Secretary of the Royal Asiatic Society of London, presenting a vocabulary of the *Makna Language* spoken on the African Coast of the Mosambique Channel.

Read a letter from Dr. Charles William Ball, Professor of Hebrew in the University of Dublin, on the subject of *Hamyaric Inscriptions* from Southern Arabia,—to which he is disposed to assign no higher antiquity than the fourth century of our era, from the circumstance of the letters being separated into distinct groups; it being ascertained that spaces between the words in any Greek writing are not older than the seventh century, and there is no reason to suppose that either the *Ethiopians or Arabians* arrived at this improvement in writing earlier than the Greeks.

Professor A. B. Orlebar, Secretary to the Museum Committee, submitted a report on the present state of the Museum, and remarked, that the objects for which it had been instituted had been steadily kept in view during the past year, and were rapidly progressing towards fulfilment. These were,—1st to make a general collection of such specimens in the various branches of *Natural History*, as would afford means of study to beginners and of comparison to students.—2nd, to make such local collections from the territories under the Bombay Presidency and other places visited by travellers from Bombay, as would at once exhibit the peculiarities of *nature and art*, both in India and the neighbouring countries. The report will be published in an early number of the Journal.

The meeting nominated Professor J. Peet and C. J. Erskine Esq., to supply the places of the Rev. G. Pigott and H. B. Frere Esq., as members of the Sub-Committee for the Museum.

Mr. Orlebar further presented a learned paper of Observations on *Solar Spots*, made between the 31st December and the commencement of the S. W. Monsoon of 1845.

The Secretary then read part of a Discourse on Arabia and the Arabs.

The thanks of the Society were accorded to the various Donors, and the meeting adjourned to Thursday the 11th of December, 1845.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 11th of Dec. 1845.

The minutes of the last meeting were read and approved of.

The following Gentlemen were proposed as members of the Society to be balloted for at its next meeting.—viz. M. Stovell, Esq., proposed

by the Secretary seconded by Captain H. B. Turner.—Dr. J. Don, proposed by the Secretary, seconded by Dr. Burns, K. H.—E. I. Wallace, Esq., Barrister, proposed by A. S. LeMessurier Esq., seconded by the Secretary.

It was proposed by Manockjee Cursetjee, Esq. Dr. Burnes, K. H. and James Bird Esq., Secretary, and carried unanimously, that the names of James Cowles Prichard, M. D. F. R. S. of Bristol, and Thomas Hodgkin, M. D. F. R. G. S. of London, be placed on the list of *Honorary Members* of the Society.

The following donations were laid on the Table:

TO THE MUSEUM.

1st. Two Jain figures from Katiawar.—By Dr. Nicholson, Civil Surgeon, Rajcote.

2nd. Specimens of large bricks dug from below the mounds which mark the ruins of the ancient city of *Vamilapura* in Kattiarwar.—By Ditto.

TO THE LIBRARY.

Report of the Bombay Chamber of Commerce for the fourth quarter of 1844-45.—By the Secretary of the Chamber of Commerce.

Professor Orlebar presented a series of Tables calculated at the Observatory from those by Major Boileau, in order to enable Meteorologists to find immediately from each observation of the wet-bulb Hygrometer, the amount of moisture in the air and its pressure. They will enable observers readily to find the correction required for Barometric observations on account of moisture.

The Secretary then read an interesting letter from His Excellency Major General Sir Charles Napier, G. C. B. Governor of Sindh, acknowledging with sincere thanks, the Society's attention in presenting through him for the use of the Sindh Association, the 1st volume of their Journal. The letter pointed out in a graphic and luminous manner the recent improvements which had been made in the construction of *Bunds*, to keep the waters of the Indus within proper channels and thus reclaim large *swamps* from the inundations of the river, which, annually overflowing, produces marshy and unhealthy localities affecting

the health of the Troops and the inhabitants. One of these *Bunds*, thirty miles in length, had been lately constructed between Sukkur and Shikarpur, in order to prevent the superfluous water of the river flowing into an unhealthy *basin* in that neighbourhood ; to the construction of which Sir Charles is disposed to attribute the superior healthiness of the Troops stationed at Sukkur for the past year, compared with the amount of sickness among them during previous seasons ; but carefully notes, that the experience of future years is requisite to establish the correctness of this opinion. Sir Charles further enumerates the productive capabilities of Sindh as a mineral and agricultural district. In return for this obliging communication, it was moved by James Bird, Esq., *Secretary* of the Society, seconded by James Burnes, K. H. *Vice-President*, and carried unanimously—"That the Society have received with the greatest satisfaction His Excellency Sir Charles Napier's highly interesting letter now read, and with his permission will include it in the next number of their Journal."

The thanks of the Society were then accorded to the various Donors, and the Meeting was adjourned to Thursday the 15th of January, 1845.

At a monthly meeting of the Bombay Branch of the Royal Asiatic Society held in its Library on Thursday the 15th of Jan. 1846.

The minutes of the last meeting were read and approved of.

The following gentlemen were proposed as members of the Society, to be ballotted for at the next meeting.—viz. Lestock Reid, Esq., and Charles James Davies, Esq., of the Civil Service, by the Hon. L. R. Reid, seconded by the Secretary.

The following donations were laid on the Table:

TO THE MUSEUM.

Minerals from Katiawar.—By Dr. Nicholson, Civil Surgeon, Rajkote.

TO THE LIBRARY.

Grammaire Persanne de Sir William Jones, seconde edition Francaise revue, corrigée et augmentée, Par M. Garcin De Tassy, Membre de l' Institut Royal de France, etc.

The Secretary then read a note from the Rev. Dr. Stevenson, accompanied by a Devanagari transcript of the great inscription from the Bauddha Caves of Nasick, with an English translation which records that the Cave was appointed for the gods and Brahmans, to mortify the passions; and was excavated at the expense of the lord *Dinika*, son of the *Kishaparátá*, ruler of the Kshatriya tribe and protector of men. The inscription further records that the constructor of this holy place gave one hundred thousand cows along with the river *Banasa* and a gift of gold on the occasion of its dedication; and sings its praises as a more desirable place of pilgrimage than *Prabhasa* (Somnath,) the holy Gaya, the Bauddha monastery of the city *Pratisraya*, or even the edifice by *Depankora* on the shore of the fresh-water sea. The date of this Inscription seems also to be mentioned under the astronomical position of the sun and planets, at the period of the gift before mentioned.

The thanks of the Society were accorded to the various Donors, and the Meeting adjourned to Thursday the 12th of February, 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 12th of February, 1846.

The minutes of the last Meeting were read and approved of.

M. Stovell Esq., Dr. J. Don, E. J. Wallace Esq., Lestock Reid Esq., and C. R. Davies, Esq. C. S. duly proposed and seconded as Members of the Society at former Meetings, were ballotted for and unanimously elected.

Dr. Ogilvie M. D., Assistant Garrison Surgeon, was proposed as a Member of the Society by Dr. Burnes, K. H. seconded by the Secretary.

The following donations were laid on the Table:

TO THE MUSEUM.

1st. From the President, the Hon'ble J. H. Crawford; a further collection of Egyptian Relics and Geological Specimens from the valley of the Nile.

2d. Specimens of Minerals and Plants at Aden. Presented by J. P. Malcolmson Esq.

TO THE LIBRARY.

1st. A Supplement to the Glossary of Indian Terms used in the North Western Provinces. By H. M. Elliot, Esq., of the Bengal Civil

Service, accompanied by a note to the Secretary, requesting to be favored with any comments on the present or suggestions for a future volume, which may be deemed necessary.

2d Abdul Rizak's Dictionary of Technical Terms, used by the *Sufies*, edited in the Arabic original by Dr. Aloys Sprenger, of the Bengal Medical Service. Presented by the Asiatic Society of Bengal.

3rd. The Bengal Pharmacopœia by W. O. O'Shaughnessy, M. D. F. R. S., Bengal Medical Service; and Pathologia Indica, by A. Webb, Esq. Bengal Medical Service. Presented by the Medical Board.

4th. Icones Plantarum Indiæ Orientalis, by R. Wight Esq., M. D. F. L. S., of the Madras Medical Service, Vol. III part 3. Presented by Government.

5th. Circular Orders of the Sudder Dewanee Adawlut of Bombay, for the years 1843 and 1844.—Presented by Government.

The thanks of the Society were accorded to the various Donors, and the Meeting adjourned to Thursday the 12th of March, 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society (postponed from the 12th of March), held in its Library on Wednesday the 8th of April, 1846.

The minutes of last Meeting were read and approved of.

G. Ogilvie, M. D., Assistant Garrison Surgeon, duly proposed a Member of the Society and seconded at the last meeting, was balloted for and unanimously elected.

His Excellency Monsieur de Lagréné, French Ambassador to China proposed an Honorary Member of the Society by the Secretary, J. Bird, Esq., and the *Vice-Presidents*, Dr. Burnes, K. H. and Col. Jervis, was duly elected in accordance with Art. III of the Regulations.

Col. Jervis, seconded by Dr. Burnes, K. H., moved that a deputation consisting of those who brought forward the forgoing proposition should wait on His Excellency Monsieur de Lagréné, and announce to him his election as Honorary Member of the Society. The proposition was unanimously carried.

On the proposal of Dr. Burnes, K. H.; seconded by Col. Jervis, it was unanimously resolved—That His Excellency should be presented with a complete copy of the Society's Journal from its commencement.

The Hon'ble James Henry Crawford, *President* of the Society, having resigned his Office consequent on his intended departure for Europe by the Mail of the 1st May next, it was proposed by the Secretary, seconded by Col. Jervis and carried unanimously—That the Society record the high sense of obligation it is under to their late *President*, for the devoted zeal and attention he has bestowed on the financial affairs of the Society, for the interest he has at all times manifested in promoting its literary objects and exertions, and for his liberal donations at various times to the Museum.

Moved by Major General Barr, seconded by Col. Dunsterville, and carried unanimously—That the Hon'ble Lestock Robert Reid be requested to accept the office of *President* of the Society, become vacant by the resignation of the Hon'ble James Henry Crawford, returning to Europe.

A letter from the Deputy Secretary of the Royal Asiatic Society of London, relative to the re-publication of the "Bombay Literary Society's Transactions", as agreed on by the Society at its Meeting on the 15th January 1844, was submitted to the Meeting, upon which the Secretary was authorized to reply that in the present state of the Society's finances, with the required list of one hundred subscribers at Rs. 20 each, not filled up, the publication must be abandoned.

The following donations were laid on the Table:

TO THE MUSEUM.

- 1st A Cobra de Capello, from W. Graham Esq.
- 2nd. A pair of horns from the "wild goat," inhabiting the hills bordering on the northern shore of the Persian Gulf, from Capt. C. Giberne, 29th Regt. N. I.
- 3rd. Specimens of *Algæ*, from Dr. Grierson.

TO THE LIBRARY.

- 1st. Appendix G. to the new Edition of Tredgold on the Steam Engine, being a Treatise on the *Cornish Pumping-Engine*; by W. Pole; F. R. A. S; F. G. S.—Presented by the Author.
- 2nd. A collection of *Integral Formulæ*, translated from the German of Meyer Hirsch. Presented by J. Waterston, Esq.

3rd. Persian and Gujarati verses in praise of Ardaseer Dhunjeeshaw. Presented by Jehangeer Pochajee.

4th. Transactions of the Bombay Geographical Society from May 1844 to February 1846. Presented by the Society.

The *Secretary* then read an interesting letter from B. A. R. Nicholson, Esq., Civil Surgeon, Rajcote, containing notes on the Ruins of *Vamilapoor* or *Valabipoora*, near Bhao-Naggar in Khatiawar; which ancient city gives name to an era commencing A. D. 319; and which is mentioned, by the Arab Geographer Abdul Rihan-al-Bairuni, as commencing at the same period as the era of the *Guptis*, or 241 years after the *Shalivahana* year, which dates from A. D. 78.

The *Secretary* also read part of a paper on the Arabian system of Geography, translated by himself from the Introductory Chapter to the *Takwim al Baldan* of Abulfeda.

The thanks of the Society were accorded to the various Donors, and the Meeting adjourned to Thursday the 14th of May, 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 14th of May, 1846.

The minutes of the last Meeting were read and approved of.

A letter from the Hon'ble L. R. Reid was read, expressing a deep sense of the honor conferred him on by the Bombay Branch of the Royal Asiatic Society in having elected him their President, and intimating his earnest desire to forward the interests and promote the objects of the Society to the utmost of his power.

A Memorandum from Sir William Harris was also read, accompanying a presentation to the Society of Charles Futschek's *Galla Grammar* and *Dictionary*, in the name of Dr. Roth of Munich; Dr. Roth has kindly volunteered his services to purchase any books required by the Society from Germany.

TO THE LIBRARY.

No. 1. A Grammar and Dictionary of the *Galla language*, by Charles Futschek; Edited by Lawrence Futschek M. D. Presented by Dr. Roth of Munich.

The Secretary then submitted a note from the Rev. J. Stevenson, D.D., accompanying his translation in part, of the *Kalpa Sutra*, the Scriptural book-authority for the *Jaina* religion. This was written by *Sri Badra Bahu Swami*, who states in his account of the 24th or last Jain Tirthankara called *Mahavira*, that he wrote 980 years after his apotheosis; from which Dr. Stevenson assumes the date of the work to be A. D. 453; while there is reason to suppose that the author of the *Kalpa Sutra*, otherwise called in tradition *Jaina Acharya*, was cotemporary with *Khka Raja*, otherwise named *Raja Amoghversha*, whose date from Copper-plate grants is known to be Saka 894. A. D. 972.

A letter from the Rev. Dr. Stevenson relative to the astronomical date given in the great Inscription from the Bauddha Cave at Nasick, submitted at the January Meeting of the Society, was also read. In this, Dr. Stevenson states the date for the calculation to be the *Sun's Longitude* in the Hindu Ecliptic 10° , *Venus* 357° , and the *Moon's Ascending Node* somewhere between 60° and 90° ; from which he deduces the date of the Inscription to be B. C. 453.

The Secretary then submitted to the Meeting an English translation, by Ball G. Shastree Esq. of a Copper-plate Inscription in Sanskrit, found during the late Kolapoor campaign in one of the Hill-forts of that country. The date of the inscription is Saka 675, A. D. 753, and the grant of land recorded was given by *Danti Darga Raja* son of Indra Raja, son of *Kakka Raja*, son of Govinda Raja, of the same family and race as *Raja Amoghaversha*, between whom and *Danti Durga Raja* the apparent founder of the family, other Copper-plate grants give a lineage of fourteen princes, bringing (on the supposition of twenty years to a reign) the origin of the family to nearly the period given in the present grant.

The thanks of the Society were accorded to the various Donors, and the Meeting adjourned to Thursday the 11th of June, 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday, the 11th of June, 1846.

The minutes of the last Meeting were read and approved of.

Capt. J. H. G. Crawford, Engineers, proposed as a Subscriber to the Library by R. W. Crawford, Esq., seconded by Capt. H. B. Turner, was admitted agreeably to the Regulations.

The following gentlemen were proposed as Members of the Society, to be ballotted for at the next Meeting, viz. G. J. Blane Esq., C. S. by W. Escombe Esq. seconded by the Secretary of the Society; and A. Malet, Esq., Political Secretary to Government, by the Hon'ble John P. Willoughby, seconded by S. S. Dickinson, Esq.

Read an account by Assistant Surgeon W. J. Stuart, of a bird of the Swallow tribe (*Hirundo esculenta*,) of which a specimen, preserved in proof spirit, was presented for the Museum.

Read also an account, by the same gentleman, of the tree from which the gum *Kino* is procured in this country and of the mode of preparing it, accompanied by specimens of the gum and the wood of the tree from which it is procured.

The best thanks of the Society were accorded to Dr. Stuart for his valuable communications and presents.

The Meeting was then adjourned to Thursday the 9th July, 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 9th of July, 1846.

The minutes of the last Meeting were read and approved of.

G. J. Blane, Esq. and A. Malet, Esq., Civil Service, proposed as Members of the Society and duly seconded at the last Monthly Meeting, were ballotted for and unanimously elected.

The following Gentlemen were proposed as members of the Society, viz. E. Down, Esq. C. S. by C. J. Davies Esq. C. S., seconded by the Secretary, and Capt. J. H. G. Crawford, Engineers, by H. B. Turner, seconded by R. W. Crawford, Esq.

A letter from Sir Erskine Perry, resigning his Office of *Vice-President*, was submitted to the Meeting.

A letter from the Marquis de Farrier-le-Vayer, accepting with thanks the mark of distinction conferred on him by the Society in electing him an Honorary Member, as communicated in its Secretary's letter of the 17th February, 1845.

A letter from the Curator of the Museum of the *Literary and Philosophical Society* of St. Andrews, dated the 29th May 1846, announcing that a donation from that Society of Geological Specimens and Minerals, in return for the contribution of the Indian Minerals sent

home by the Bombay Branch Royal Asiatic Society, had been shipped from Liverpool, on board the brig *Hesperus* for the latter.

James Bird, Esq. proposed by J. Burnes, K. H. seconded by Major Gen. Barr, was unanimously elected a *Vice-President* of the Society to fill the vacancy made by the resignation of Sir E. Perry, the former to retain his Office of Secretary of the Society in conformity to a similar proposition of the Bengal Asiatic Society, in which H. Torrens, Esq. was elected to the double Office of V. P. and Secretary,

The following donations were presented to the Society :

TO THE MUSEUM.

1st. From Assistant Surgeon F. Broughton, through the *Vice-President* J. Burnes, K. H., a skull from New Zealand, and some specimens of Lead and Copper ore from the mines of *Glen Ozman*, near Adelaide in South Australia, and from the *Montacute* mines in the same neighbourhood; also a specimen of the *Sphæria Robertii*.

2nd. From Capt. J. Young I. N. a collection of Birds' skins, from New Zealand. Presented through Professor Orlebar.

The Secretary then read some "Notes," by Assistant Surgeon H. J. Carter, on the great *Mahrah* Tribe of Southern Arabia; accompanied by a Vocabulary of the *Mahrah* Language and further "Notes" on the *Garah* Tribe.

A note from Professor Orlebar accompanying a description of the phenomena attendant on the annular Eclipse of 1840 in India, with computations and illustrations drawn up by Keru Luxuman, one of the Assistants at the Observatory, was also read.

The best thanks of the Society were accorded to the Donors of the above valuable presents and communications, and the Meeting was adjourned to Thursday the 13th of August, 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 13th of August, 1846.

The minutes of last meeting were read and approved of.

E. Down Esq., C. S. and J. H. Crawford, of the Engineers, proposed as Members of the Society and duly seconded at the last Meeting, were ballotted for and unanimously elected.

The following gentlemen were proposed and duly seconded as Members of the Society, Capt. Curtis, by W. Escombe Esq., seconded by W. H. Harrison, Esq.; A. F. Bellasis Esq. C. S., by W. H. Harrison, Esq., seconded by W. Escombe Esq.; and Lieut. J. F. Jones, I. N. by Capt. H. B. Lynch, seconded by Capt. H. B. Turner.

Agreeably to the notice in the Monthly Circular, the proposal to have the Calcutta Review taken in from its commencement, was submitted to the Meeting; relative to which it was resolved—

That this proposition recommended by the *Committee of Management*, be sanctioned; in consequence of the Asiatic Journal (one of the periodical publications retained in the list adopted by the General Meeting held on the 13th of February 1846,) having been discontinued.

Read a letter from Sir Erskine Perry accompanying a present of copies of some of the printed minutes of the Law Commission with reference to a new Law Tribunal. Sir E. Perry regrets that it is not in his power to forward to the Society a complete series, as the views contained in them are especially applicable to India. The other part of the letter comments on the deficiencies that exist in the classes of works in the Society's Library, which refer to the Government of India and Oriental Literature.

The following donations were presented to the Society :

TO THE LIBRARY.

1st. From Sir Erskine Perry,—Minutes on Law Reform with reference to a New Tribunal.

2nd. From E. Wallace, Esq. Barrister at Law, Bombay,—A Map of the *Oregon Territory*, the subject of dispute between the British and United States' Government, with a Pamphlet on the controversy written by the Donor.

3rd. From the Government with a letter from W. Escombe, Esq.—A Copy of the Reports on the Roads and Tanks for 1844-45, drawn up by the Government Superintendent.

TO THE MUSEUM.

From the *Literary and Philosophical Society* of St. Andrews,

through Dr. Buist.—119 Geological Specimens and Minerals, chiefly from the County of Fife.

The best thanks of the Society were accorded for the various Donations, and the Meeting adjourned to Thursday the 10th of September, 1846.

At a Monthly Meeting of the Bombay Branch Royal Asiatic Society, held in its Library on Thursday the 10th September, 1846.

The minutes of the last Meeting were read and approved of.

Capt. Curtis, A. F. Bellasis, Esq. By. C. S. and Lieut. J. F. Jones, I. N. proposed as Members of the Society, and duly seconded at the last Meeting, were ballotted for and unanimously elected.

The following gentlemen were proposed as Members of the Society to be ballotted for at its Meeting viz.—T. S. Cowie Esq., proposed by R. W. Crawford, Esq., seconded by the Secretary;—A. Blackburn Esq. proposed by John Holland, Esq. seconded by R. W. Crawford, Esq.; and T. J. A. Scott, Esq. proposed by the *Vice-President* Col. Jervis, seconded by the *Secretary*.

The following donations were presented to the Society :

TO THE LIBRARY.

Memoirs of the Royal Astronomical Society of London. Presented by that Society.

TO THE MUSEUM.

From Capt. T. Johnson, Commanding the Ship *Recovery*, a large specimen of *Cheiroptera* from the island of Java.

A letter from Capt. P. T. French, dated Mundlaiser, accompanied by copy of an inscription in the round character of the Armenian, was also submitted. The stone from which the inscription was taken, was brought several years ago from Asseer, and records that it belongs to the tomb of Sarkies, the son of Lagar Khoorsian of Jevan, who died suddenly on Ascension Day, the 17th June, 1131. There is a second inscription in the same character on another stone, which is somewhat broken; a copy also of which Capt. French offers to forward to the Society.

A letter from W. Escombe Esq., Secretary to Government, presenting to the Society a copy of a *Prakrit* inscription, (taken from Copper plates found at *Oojein*), forwarded to Government by Assistant Surgeon E. Impey, was also laid before the Meeting.

The Secretary then submitted for examination a collection of undescribed *Parthian Coins* belonging to John Bowman, Esq. accompanied by Numismatic observations on leading historical points and peculiarities of this collection.

The best thanks of the Society were accorded for the various donations and presents, and the Meeting was adjourned to Thursday the 8th October, 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 8th October, 1846.

The minutes of the last Meeting were read and approved of.

S. Cowie Esq., Andrew Blackburn, Esq. and T. J. A. Scott, Esq. proposed as Members of the Society and duly seconded at the last Meeting, were ballotted for and unanimously elected.

MUSEUM.

The following donation was presented to the Society by James Bird, Esq. viz. Ten silver Coins, being a part of four hundred lately found in a ploughed field near Shirouli, distant ten miles eastward of Narayan-goan, in the district of Junir. The Donor states that they are of *Vijaya Sah*, *Rudra Sah*, *Atri Dama*, and *Wiswa Sah*, four of the ten *Sah Rajas* of whom a nearly correct list was given by the late James Prinsep, Esq., that they will prove of great use in further investigation of the Sah dynasty, and their dates and Greek legends will afford considerable help in determining the relative position of these Princes to the *Valabhi* and *Gupta Rajas* of the fourth and fifth centuries of the Christian era.

The thanks of the Society were accorded to Dr. Bird, and the Meeting was adjourned to the 12th of November; 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 12th of November, 1846.

The minutes of the last Meeting were read and approved of.

Members proposed; Lieut. G. F. Ashburner 8th Regt. N. I., proposed by Dr. James Burnes, K. H. V. P. and seconded by Major Holland.

Letters and Communications.-- Letters were read from Major General Vans Kennedy and Professor Orlebar, respecting the merits of Mr. McCudden's work on Oriental Eras.

The Meeting adjourned to the 12th December, 1846.

At the Anniversary Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Monday the 30th November, 1846.

The minutes of the last Meeting were read and approved of.

Lieut. G. E. Ashburner, 8th Regt. N. I. proposed a Member of the Society and duly seconded at the last meeting, was balloted for and unanimously elected.

The Meeting proceeded to the election of *Office-bearers* for the ensuing year; on the proposition of Col. Jervis, *Vice-President*, seconded by J. Glen, Esq., the Rev. John Stevenson, D. D. was unanimously elected a *Vice-President* of the Society.

The *Committee of Management*, was then balloted for, and the following gentlemen chosen, viz. Professor John Harkness, Capt. H. B. Turner, S. S. Dickinson, Esq., Rev. G. Cook, J. Glen, Esq., J. Don, M. D., C. Morehead M. D., Capt. H. B. Lynch, I. N.; W. Howard, Esq. and J. Scott, Esq.

The following gentlemen were also chosen as a *Committee for the Museum*: Professor A. B. Orlebar, Rev. G. Pigott, H. J. Carter, Esq. C. J. Erskine, Esq., Lieut. W. F. Marriott, and Capt. T. M. B. Turner.

The Meeting was then adjourned to the 10th of December, 1846.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 10th December, 1846.

The minutes of the last Meeting were read and approved of.

The Rev. P. Anderson, Chaplain, was proposed as Member of the Society by the Rev. G. Pigott, seconded by the *Secretary*, to be balloted for at the next Meeting.

The Secretary submitted a letter from the chief Secretary to Government, transmitting ten printed copies of a despatch from the Honor-

able the Court of Directors to the Government of India, intimating that a *Statistical Department* had been formed in the Home Establishment, where all information relative to the Geology, Climate, Cultivation, and Agricultural Productions, Population, Commerce and Political Geography of the various districts in India will be received, arranged, and recorded for reference.

The Secretary was authorized to thank Government for the information communicated, and to state in reply that the Society is ready to promote the useful and interesting researches contemplated by the Honorable Court, and to aid in carrying out its object in any way which Government may propose.

The following donations were presented to the Society :—

A copy of the *Bhagavata Purana* lately printed in Sanskrit, at the Royal Press of Paris, under the superintendence of M. Eugene Burnouf, Member of the Institute of France. Presented and accompanied by a letter from the French Government to the *President* of the Society.

The Secretary was instructed to draft a letter of thanks for this most acceptable donation, and to acquaint Monsieur Lebrun, Director of the Royal Press of Paris, that copies of the Society's Journal from its commencement, will be forwarded in the name of the Society, for presentation to the *Royal Library*.

TO THE MUSEUM.

120 Specimens of Ores from Germany. Presented by J. Bowman, Esq.

The best thanks of the Society were accorded to Mr. Bowman for his valuable present.

The Meeting then adjourned to Thursday the 14th January, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 14th January, 1847.

The minutes of the last meeting were read and approved of.

The Rev. P. Anderson, Chaplain, proposed as a Member of the Society, and duly seconded at the last meeting, was ballotted for and unanimously elected.

On the motion of R. W. Crawford, Esq., seconded by J. Bird, Esq.,

intimating that Sir David Pollock, *Chief Justice*, Member of the Royal Asiatic Society of Great Britain, should be invited to become a Member of this Society,—the *Secretary* was instructed to write to Sir David Pollock, and to inform him that he had been admitted a Member by virtue of his belonging to the Home Society.

The following Gentlemen were proposed and duly seconded as members of the Society to be balloted for at its next meeting; Lieut. C. G. Constable, I. N. by H. J. Carter, Esq., seconded by the *Secretary*, and Dr. W. C. Coles, B. M.S. by the *Secretary*, seconded by H. J. Carter, Esq.

On the motion of the *President* the Hon. L. R. Reid, seconded by the *Vice-President* Col. Jervis, it was resolved,—That in testimony of the profound learning, deep and varied acquirements, in History, Philology, and other branches of Oriental Literature, of the late Major General Vans Kennedy, this meeting, from a grateful appreciation of his long and valuable services in connection with General Literature, and the special object for which the Bombay Branch of the Royal Asiatic Society was instituted, do record its admiration of his great and varied talents, with an expression of deep regret for the loss experienced by his death; and that a special meeting be convened on Thursday the 4th February next, for taking into consideration the best method of manifesting the Society's respect for his memory.

The following donations were presented to the Society :

TO THE LIBRARY.

A letter from the Chief Secretary to Government, presenting Vol. III. Part 4 of Wight's *Icones Plantarum Indiæ Orientalis*.

A letter from the Secretary to Government, in the General Department, presenting Report No. V. of the Board of Education, for the year 1845.

TO THE MUSEUM.

Specimens of Copper-Ore brought from the Island of *Maseera* on the South-East Coast of Arabia by Assistant Surgeon Carter. Presented by the Government.

ORIGINAL COMMUNICATIONS.

Assistant Surgeon Carter's Report on Copper-Ore from the Island

of *Maseera*; and of Lithographic Limestone from the South-Eastern Coast of Arabia.

An account, by the Rev. Dr. Stevenson, of the Marriage Ceremony of Brahmans, who wish to contract the *third* Marriage, and are anxious to avert the evils and misfortunes denounced against such contracts.

The best thanks of the Society were accorded for the various donations and interesting papers noticed.

The Meeting was adjourned to the special Meeting appointed to be held on the 4th of February, 1847.

At a Special Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library, on Thursday the 4th of February 1847, for the purpose of taking into consideration the best method of manifesting the Society's respect for the memory of the late Major General Vans Kennedy.

The minutes of the last meeting were read and approved of.

A Biographical Memoir of the late General Kennedy was then read by the *Secretary*, after which it was moved by the Hon'ble the *President* L. R. Reid, seconded by the *Vice-President* Col. Jervis, and resolved, —That in reference to a resolution of the Society passed on the 14th of January to call a special meeting on this day, to take into consideration the best method of manifesting its respect for the memory of the late Major-General Vans Kennedy, this Society, in addition to its opinion of his valuable services in connection with *Oriental Literature* &c. already recorded in its proceedings, do open a subscription for the purpose,—1st of erecting a suitable monument over his remains, and 2nd of providing a Gold Medal, to be placed annually at the disposal of the Board of Education, and awarded by it in a manner that may seem most conducive to the promotion of Oriental Literature.

2nd. It was moved by Chief Justice Sir David Pollock, seconded by the *Vice-President* and *Secretary*, J. Bird, Esq.—That the subscription should not be confined to members of the Society alone, but be open to all persons.

3rd. It was moved by the Hon'ble J. P. Willoughby, Esq., seconded by J. Glen, Esq.—That the Biographical Memoir of Major General Vans Kennedy be printed in the Society's Journal, and copies of it distributed to all the learned Societies connected with Oriental Literature

in all parts of the world, with an expression of the Society's deep regret at the demise of one so deservedly celebrated in the *Annals of Oriental Learning*.

4th. It was moved by C. J. Erskine, Esq., Priv. Secy. to the Governor, seconded by A. Malet, Esq., Secy. to Government—That the several Asiatic Societies in Asia, Europe, and America, be specially invited to join in this tribute of respect to the memory of one whose reputation as an Oriental Scholar is so widely extended throughout the civilized world.

Sir David Pollock, seconded by Dr. Buist, then proposed—That the cordial thanks of this Meeting be presented to the *Secretary* of the Society, for his able and satisfactory Memoir of Major General Vans Kennedy. The above propositions were carried unanimously.

The Meeting was then adjourned to Thursday the 11th of February, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library, on Thursday the 11th February, 1847.

The minutes of the last Meeting were read and approved of.

Lieut. C. G. Constable, I. N. and Dr. W. C. Coles, By. M. S. who were duly proposed and seconded as Members of the Society at the former Monthly Meeting, were ballotted for, and unanimously elected.

Capt. Partridge, of the 8th Regiment N. I. proposed as a Member of the Society by Dr. Buist, seconded by the Secretary, to be ballotted for at the next Monthly Meeting.

On the motion of the *Vice-President* Col. Jervis, seconded by the *Vice-President* and *Secretary*, J. Bird, Esq., it was resolved,—That a deputation, consisting of the *President*, *Vice-President*, and *Secretary*, should wait upon the Hon'ble the Governor, George Russell Clerk, to solicit his Honor to become the Society's Patron.

On the motion of R. W. Crawford, Esq., seconded by the *Vice-President* the Rev. J. Stevenson, D.D., it was resolved,—That Sir David Pollock, Chief Justice, be further requested to do the Society the honor of becoming its *Vice-Patron*.

It was then proposed by the *Vice-President*, the Rev. J. Stevenson D.D., seconded by the Rev. G. Pigott, and unanimously resolved,—That in consideration of the many and deep obligations which this Society is

under to Professor Orlebar, both for the assiduous labour and varied talents which he has devoted to the classification of the Museum, in all its branches, as well as for the zeal which he has invariably displayed in furthering its literary and scientific objects, *this Society* do convey to professor Orlebar, through their Secretary, their sincere regret at the cause which has compelled him to finally leave India, with an expression of their high sense and appreciation of the extent and value of his former services as Secretary (already placed on record in the proceedings of the Society), and since as Conservator of the Museum.

On the suggestion of the Rev. G. Pigott, H. J. Carter, Esq., B. M. S. was unanimously nominated by the Society as *Conservator* of the Museum in succession to Professor Orlebar.

The following donations were presented :—

TO THE LIBRARY.

Twelve volumes of the Bible for the Blind, and a copy of Grammar embossed for the purpose of teaching them to read. Presented by H. B. E. Frere, Esq.

No. III. of Jordon's Illustrations of Indian Ornithology. Presented by Framjee Nasserwanjee, Esq.

A copy of the *Sanhita* of the *Sama Veda*, translated into English by the Rev. John Stevenson, D.D. Presented by the Author.

TO THE MUSEUM.

1. A collection of Fossils from Sindh and the valley of the Indus. Presented through Dr. Buist, by Capt. Partridge, of the 18th Regiment N. I.

2. A collection of Geological Specimens from Khatiawar, collected by Capt. H. Aston, Ist Assistant to the Political Agent at Rajcote, with a letter from A Malet, Esq., Political Secretary to Government. Presented by Government.

ORIGINAL COMMUNICATIONS.

Assistant Surgeon Carter's account of the *Frankincense Tree* of *Arabia* with remarks on the misplacement, of the "*Libanophorous Re-*

gion," in Ptolemy's Geography accompanied by a Botanical drawing of the tree producing Frankincense.

The best thanks of the Society were accorded for the donations to the Library and Museum; and the Meeting adjourned to Thursday the 11th of March, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 11th March, 1847.

The minutes of the last Meeting were read and approved of.

Capt. Partridge 18th Regt. N. I., duly proposed and seconded as a Member of the Society at its last Meeting, was ballotted for and unanimously elected.

The following Gentlemen were proposed and duly seconded as members of the Society, to be ballotted for at its next Meeting; Dr. Hyslop, by Capt. Carless I. N. seconded by James Bird, Esq; Lieut. J. B. Dunsterville, by Col. J. H. Dunsterville, seconded by J. Glen, Esq; and E. Impey, Esq., by Capt. Montriou, I. N., seconded by H. J. Carter, Esq.

Letters were then read from Sir David Pollock, accepting the Office of *Vice-Patron* of the Society, and from Dr. Sperschnneider, accompanying a present from Dr. Pruner of Munich.

The following donations were presented to the Society:

TO THE LIBRARY.

1st. Two copies of the "Provisional Report on the Meteorological Observations made at Colabah, Bombay, for the year 1844" by G. Buist, Esq., L.L. D. Presented by the Author.

2nd. A Copy of a paper on the identity of feature between the Ancient Egyptians as figured in the tombs at Thebes and the Fellahs of the present day, by Dr. Pruner. Presented by the Author.

The best thanks of the Society were ordered to be transmitted to Dr. Buist, and to Dr. Pruner for their valuable contributions to the Library.

Respecting the motions, of which notice was given at the last Meeting, for the alteration of Arts. VII and XLI. of the Society's Rules, it was proposed by R. W. Crawford, Esq., seconded by T. M. B. Turner, and carried,—That the following sentence shall be added to Art. VII of the Society's Rules, viz.—

“The Members of the Society resident in Salsette, Caranja, or Angria’s Colabah, are allowed the option of being considered Resident or Non-Resident Members.”

The Meeting then adjourned to Thursday the 8th of April, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 8th of April, 1847.

The minutes of the last Meeting were read and approved of.

Dr. Hyslop, Lieut. J. B. Dunsterville, and E. Impey Esq. who were duly proposed and seconded as Members of the Society at its last Meeting, were ballotted for and unanimously elected.

Col. G. Moore, Auditor General was proposed as a member of the Society by the *President*, seconded by W. Escombe, Esq.

The following donations were presented to the Society :

TO THE LIBRARY.

1st. The sixth volume of Thornton’s History of British India, *in sheets*. Presented by the Hon’ble the Governor in Council, accompanied by a letter from W. Escombe, Esq., Secretary to Government in the General Department.—2d The Bengal Pharmacopœia, and General Conspectus of Medicinal Plants, by W. B. O’Shaughnessy, M. D. F. R. S. &c. Presented by the Author.—3d A translation from the German, of Dr. E. Alban’s, High-pressure Steam-Engine investigated, with notes by W. Pole, Esq., F. R. A. S. Presented by the Translator.

ORIGINAL COMMUNICATIONS.

Geological Observations on the banks of the river Taptee, accompanied by a section taken from a Ford near the village of Dolan, by A. B. Orlebar, A. M. Presented by the Author.

TO THE MUSEUM.

A collection of Geological Specimens from the Ford near the village of Dolan above mentioned. Presented by A. B. Orlebar, A. M.

The best thanks of the Society were ordered to be transmitted to the

several Contributors for their valuable additions to the Library and Museum, and the Meeting was adjourned to the 13th of May, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday, the 13th of May, 1847.

The minutes of the last Meeting were read and approved of.

Col. Moore, Auditor General, duly proposed and seconded as a Member of the Society at the last Meeting, was ballotted for and unanimously elected.

Mr. Wattenbach, was proposed as a Member of the Society by Capt. T. M. B. Turner, seconded by Lieut. Marriott.

Letters were read from Lieut. Col. Melville, Secretary to Government, Lieut. Col. Waddington, Capt. Montriou, I. N., and the Rev. William Clarkson.

The following presents to the Society were laid before the Meeting :

TO THE LIBRARY.

“Magnetical and Meteorological Observations made in the Observatory at Colabah, Bombay, from April to December 1845.” By Professor A. B. Orlebar, M. A. of the Elphinstone Institution. Presented by the Hon’ble the Governor in Council.

Through the Lord Bishop of Bombay,—“Expository Lectures on St. Paul’s Epistles to the Colossians,” by Daniel, Bishop of Calcutta. From the Author.—“Five Sermons on public occasions,” by the Bishop of Calcutta. From the Author.—“Journal of a Visitation Tour through the provinces of Madura and Tinnevely in the Diocese of Madras, to which are added two Charges,” by the Right Reverend George Trevor Spencer, Lord Bishop of Madras. From the Author.

Through the Hon’ble L. R. Reid, *President* of the Society, “A Catalogue of Chinese Buddhistical Works,” also “Statistics of Government Charitable Dispensaries.” Presented by Lieut. Col. W. H. Sykes, F. R. S.—Through the Hon’ble the Governor in Council, from the Hon’ble the Court of Directors. “Facts and suggestions concerning the Economic Geology of India,” by Professor D. T. Ansted, F. R. S. Vice-Secretary, Geological Society.—“A Grammar of the Gujarati Language,” by the Rev. William Clarkson, of the London Missionary Society. Presented by the Author.

TO THE MUSEUM.

A large collection of Mineralogical Specimens from the Countries of *Khatiawar* and *Cutch*, each labelled with the name of the place from whence it was taken and its distance from some known station. Presented by Lieut. Col. Waddington, C. B.

The best thanks of the Society were voted to the several Contributors for their valuable presents to the Library and the Museum; and the Meeting was adjourned to Thursday the 10th of June, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 10th of June, 1847.

The minutes of last Meeting were read and approved of.

Mr. Wattenbach, duly proposed and seconded as a Member of the Society at its last Meeting, was ballotted for and unanimously elected.

Letters were read from H. M. Elliot, Esq., Secretary to the Government of India with the Governor General, and Henry Cope, Esq., Secretary to the Archæological Society of Delhi.

Presented to the Museum.—Two Specimens of *Scorpio aser* from Cochin on the Malabar Coast by Capt. Lynch, Indian Navy.

With reference to the letter of H. M. Elliot, Esq., requesting the Society to furnish him with a list of its manuscripts on subjects connected with Indian History,—it was resolved, that one should be made out after the form transmitted and forwarded to his address by the earliest opportunity.

It was also resolved, upon the reading of the letter of Henry Cope, Esq.,—That a complete set of the Society's Transactions be forwarded to his address for the acceptance of the Archæological Society of Delhi, and that the Secretary be requested to intimate the willingness of the Bombay Branch of the Royal Asiatic Society to co-operate with it in any way that will tend to promote its objects.

Adverting to the printed dispatch forwarded by the Hon'ble the Court of Directors to the Government of India for the purpose of obtaining general statistical information of India, copies of which had been transmitted through the Government of Bombay to the Society,—Dr. J. Stevenson *Vice-President*, stated, that at the last meeting, the Hon'ble the Governor had been pleased cursorily to ask what had been done in

this respect, and that actuated by this, he was induced to submit the following resolutions to the Society, viz.—

1st. That as the subject of Statistics has of late particularly occupied the attention of the Royal Asiatic Society at home, this Branch appoint a Statistical Committee for this special object.

2nd. That as a general *Census* of the population of the island of Bombay must form one of the fundamental elements of a Statistical Report, steps be immediately taken in connection with Government, to have an accurate *census* made.

3d. That as considerable expense will attend the taking of this census, the Statistical Committee be directed to put itself in communication with Government and to obtain from that quarter the necessary funds, as unfortunately at the present time the Society's finances will not permit of its doing more than directing and superintending the operations of the Agents employed in the work.

4th. That to ensure the completion as soon as possible of an accurate Statistical Report of the Island, the Statistical Committee be directed to divide itself into sections, as for example, into a Population, a Geological, an Antiquarian, a Mercantile, a Medical, and an Educational Section.

5th. That it be distinctly understood, that if the labours of the Statistical Committee succeed in Bombay, the results will be published in the Society's Journal, and steps taken for extending operations of a similar nature to the other cities and districts of the Presidency through the Non-Resident Members of the Society in their respective Provinces.

The above resolutions having been read, a copy of them was ordered to be posted in the Library, and their discussion deferred until the next Meeting of the Society.

The best thanks of the Society were voted to Captain Lynch I. N. for his valuable present to the Museum, and the Meeting was adjourned to the 8th of the July, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society held in its Library on Thursday the 8th of July, 1847.

The minutes of the last Meeting were read and approved of.

Capt. Ethersey, I. N. was proposed as a member of the Society, by Capt. Carless, seconded by James Bird, Esq; Major D. Davidson, Com-

missary General, was proposed a member of the Society, by Dr. Don, seconded by J. Glen, Esq.

Read a letter, from Professor Lassen of Bonn to the Secretary, intimating that No. IX of the Society's Journal, which was forwarded to him by a private channel, had not been received. In reference to this, it was resolved, that Nos. IX and X. of the Journal should be forwarded to Professor Lassen by the first Mail, to the care of Mr. J. M. Richardson, London.

PRESENTED TO THE LIBRARY.

A Copy of M. A. W. Von Schlegel's *Bhagavad Gita*, edited and corrected under the care of Christian Lassen. Presented by the Editor.

An account of China, comprising the Topography, History, Customs, and Languages,—written in Gujarati, by Cowasjee Sorabjee Cowasjee Patell. Presented by the Author.

Royal Astronomical Society's Proceedings No. 12 of Vol. VII, February 1847. By that Society.

Files of the London Times Newspaper from 1822 to 1846. Presented by the Proprietors of the Bombay Times, through Dr. Buist.

A Copy of the Report on Roads and Tanks for the years 1845 and 1846, by the Superintendent. By the Government.

Dr. Stevenson's propositions for appointing a Statistical Committee, to obtain in connexion with Government a correct *census* of the population of Bombay as the first step to a Special Report of the Island, and afterwards to extend its labours to the several districts of the Presidency, was submitted to the Meeting for discussion, and it was resolved,—That the following gentlemen be appointed a Sub-Committee for ascertaining and reporting to the Society whether it be practicable to carry out the objects contemplated by these propositions,—viz. The Rev. Dr. Stevenson, *President*; Professor John Harkness; Assistant Surgeon H. J. Carter; The Rev. G. Pigott; The Rev. Mr. Mitchell; H. Young, Esq. C. J. Erskine Esq; J. Smith Esq; Capt Curtis; Capt. H. B. Turner, Cursetjee D. Pestonjee, Esq; Juganath Sunkursett, Esq; Aga Mahomed Jaffer, Esq; Manackjee Cursetjee Esq; and the *Secretary* of the Society.

On the proposition of the Rev. G. Pigott, seconded by the Secretary, it was resolved,—That a Sub-Committee consisting of C. J. Erskine, Esq. Professor John Harkness, H. J. Carter, Esq. and the Secretary be ap-

pointed to report on the present state of the Library, and the best means of securing a better preservation of the Standard Works and valuable MSS. belonging to the Society.—It was further resolved on the motion of the *President* that Mr. Pigott's name be added to this Committee.

The Secretary then submitted to the Meeting a valuable and interesting paper on the "Balsam-Trees (*Balsamodendra*) of Sindh," by Assistant Surgeon J. E. Stocks, Vaccinator in Sindh.

The best thanks of the Society were voted to the Author of this communication, and to the several Contributors for their valuable presents to the Library.—The Meeting was then adjourned to Thursday the 12th of August, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday, the 12th of August, 1847.

The minutes of the last meeting were read and approved of.

Capt. Ethersey, I. N. and Major D. Davidson, Commissary General, who were duly proposed and seconded as Members of the Society at its last Meeting, were ballotted for, and unanimously elected.

Read,—The following letter dated Simla, July the 8th, from the Foreign Secretary to the Government of India in attendance on the Governor General.

Simla, July 8th 1847.

Dear Sir,—As a Mission is about to start to the frontier of Chinese Tartary, I shall be glad to learn if there is any question of literary or scientific interest which you would wish its Members to make the subject of their investigation.

A Barometer and a few Magnetical and other Philosophical Instruments accompany the Mission, which will consist of Capt. Cunningham, Dr. T. Thomson, and Lieut. Strachey; and to such careful and intelligent observers may safely be entrusted any enquiry your learned Society may wish them to prosecute.

I remain,

Dear Sir,

To,
*The Secretary to the
 Branch Asiatic Society, }
 Bombay.*

Your most obedient servant,
 (Signed) H. M. Elliot,
Foreign Secy. to Govt. of India.

With reference to this letter, the Secretary submitted a draft of *Desiderata* relative to the *Orography, Hydrography, Ethnology* and *Archæology* of *Central Asia*. On which it was resolved,—That the draft be adopted, and forwarded without delay to H. M. Elliot, Esq. the Foreign Secretary with the Governor General; and that a copy of his letter be transmitted to the Geographical Society, requesting to be informed if its Members have any questions to propose to the Mission.

Read,—A letter from the Secretary of the Bombay Government, presenting three copies of the Report of the Board of Education for 1846.

The following presents to the Society were laid before the Meeting :

TO THE LIBRARY.

Zeitschrift fur die Kunde des Morgenlandes herausgegeben, von Christian Lassen.—By the Author.

La Rhétorique des Nations Musulmanes d'après le traité Persan, intitulé Hadayik ul-Balagat, par M. Garcin de Tassy.—By the Author.

Statistics of Civil and Criminal Justice, and of Government Charitable Dispensaries in India. By the Author Lieut. Col. Sykes, C. B.

Circular Orders of the Sudder Dewanee Adawlut, Vol. I, part 3, and Report of the Board of Education for 1846. By Government.

Prospectus of a general exposure of the Oriental Pantheon, or a Review of the spurious creeds now extant in the East. By the Author, Mr. Muhleisen.

TO THE MUSEUM.

Specimens of Iron-ore from Malwan. By Lieut. C. W. Montriou, I. N.

In reference to the proceedings of last Meeting appointing a Sub-Committee for ascertaining and reporting whether it be practicable to carry out Dr. Stevenson's propositions for obtaining a correct *Census* of the population of Bombay, the Sub-Committee reported to the Meeting of the Society, that having made the necessary preliminary inquiries, and obtained returns of the number of houses in the several divisions of the Island, the Committee are of opinion that, under present circumstances, and in deference to the feelings of the Natives, it is advisable to postpone the *Census*.

For the donations to the Library and Museum the thanks of the Society were unanimously voted; and the Meeting was adjourned to Thursday, the 9th of September, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 9th of September, 1847.

The minutes of the last Meeting were read and approved of.

H. P. Malet, Esq., C. S., proposed as a Member of the Society by A Malet, Esq., seconded by James Bird, Esq., to be ballotted for at its next Meeting.

In reference to the proceedings of last Meeting, that a Copy of the Letter from the Foreign Secretary to the Government of India, be forwarded to the Geographical Society, requesting to be informed if its Members have any questions to propose to the Mission proceeding to the Frontiers of Chinese Tartary,—the Secretary read a reply from that Society, containing suggestions on certain points to which the attention of the Members of the Mission might be usefully directed. This reply was accompanied by a copy of a letter from R. Chambers, Esq. of Edinburgh, who, in reference to a paper on *Ancient Beaches*, read by him at the Oxford Meeting of the British Association, sought for further information and facts similar to those on which his deductions had been made, on the subject of the relative levels of sea and land over large portions of the Globe. Resolved—That both Communications be transmitted to H. M. Elliot, Esq., Secretary with the Governor General, for the purpose of recommending the proposed investigations contained in them to the favorable attention of the Members of the Mission.

There being no other business, the Meeting was adjourned to Thursday the 14th of October, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Thursday the 14th of October, 1847.

The minutes of the last Meeting were read and approved of.

In reference to the proceedings of the Society's Meeting of the 12th August last, directing that the Notes of Inquiry for the Thibet Mission, should be dispatched to the Foreign Secretary to the Government of India in attendance on the Governor General, to be followed by ques-

tions expected from the Geographical Society. Read,—letters of thanks acknowledging their receipt, and stating that they had been forwarded for the use of the members of the Mission.

The following presents to the Society were laid before the Meeting :

TO THE LIBRARY.

Royal Astronomical Society's Proceedings No. 13 of vol. VII, March, 1847.

TO THE MUSEUM.

A white marble Jain Image dug up in the Town of Broach. Presented by A. W. Ravenscroft, Esq.

A Bow and Arrows taken from a Sikh Soldier on the field of Sobroan. Presented by Mr. Blackwell, through Dr. Buist

The following papers presented to the Society were read to the Meeting :

Notice of Dr. Both's investigations of the Vedas, by the Rev. J. M. Mitchell. Some Remarks on the relation that subsists between the Jain and Brahmanical Systems of Geography, accompanied by two Maps illustrative of Puranic Geography, by the Rev. John Stevenson, D.D.

The Society's best thanks were voted for 'the several donations, and for the interesting and valuable communications mentioned. The Meeting was then adjourned to Thursday the 11th of November, 1847.

At a Monthly Meeting of the Bombay Branch of the Royal Asiatic Society held in its Library on Thursday the 11th November, 1847.

The minutes of the last Meeting were read and approved of.

H. P. Malet, Esq., C. S. duly proposed and seconded as a Member of the Society, was ballotted for and unanimously elected.

The Hon'ble Sir William Yardley, and J. G. Lumsden, Esq. C. S. were proposed as Members of the Society, by the Hon'ble Sir Erskine Perry, seconded by Col. Jervis *Vice-President*, to be ballotted for at the next Meeting.

The *Secretary* announced his approaching departure for Europe, and

consequent intention of resigning his office at the Anniversary Meeting of the 29th instant.

The following donations to the Library and Museum were laid before the Meeting:

TO THE LIBRARY.

Notizia intorno alla famosa opera istorica di A,bd-er-Rahhman Ibnu Khaldun del Conte Cavaliere Jacobo Graberg Da Hemso.—Ultimi Progressi della Geographia, by ditto.—Observations authentiques sur La Peste du Levant, by ditto. Presented through the Rev. J. Wilson D.D.

TO THE MUSEUM.

Shells from Kattiawar, collected by Capt. H. Aston. Presented by Government.

There being no other business, the Meeting was adjourned to Monday the 29th November, 1847.

At the Anniversary Meeting of the Bombay Branch of the Royal Asiatic Society, held in its Library on Monday the 29th November, 1847.

The minutes of the last Meeting were read and approved of.

Dr. Arbuckle, Bombay Medical Service, was proposed as a member of the Society by Dr. Glen, seconded by Dr. J. Scott.

The Meeting, in conformity with Art. X of the Rules, proceeded to the election of Office-Bearers; when on the proposition of the *President*, seconded by Dr. Stevenson, Sir Erskine Perry was unanimously chosen *Vice-Patron* of the Society; and the following gentlemen were duly elected, for the Managing Committee of the ensuing year, viz.—Professor John Harkness; C. J. Erskine Esq.; S. S. Dickinson, Esq.; Rev. G. Cook; J. Glen, Esq.; J. Don, M. D.; C. Morehead, M. D. Capt. H. B. Lynch I. N.; W. Howard, Esq., and John Scott, Esq.

The following gentlemen were also nominated a Committee for the Museum, viz.—The Rev. G. Pigott; H. J. Carter, Esq.; C. J. Erskine

Esq.; Lieut. W. F. Marriott; Lieut. C. W. Montriou I. N. and Dr. W. C. Coles.

Col. G. Moore and A. Spens Esq. C. S. were nominated Auditors for the Society's Annual Accounts.

Dr. Bird, *Vice-President* and *Secretary*, having resigned these Offices, in consequence of his approaching departure for England, the Hon'ble J. P. Willoughby, was unanimously elected *Vice-President*, and H. J. Carter, Esq. *Secretary*.

It was then proposed by the *President*, seconded by Sir Erskine Perry, and resolved,—That the thanks of this Society be given to Dr. Bird, who has now resigned the Office of Secretary, which he has so ably and zealously filled for a period of three years, during which his scientific attainments and great knowledge of Indian Literature have proved highly beneficial to the Institution; and that the Society further express its regret at the loss of his valuable services in India, resting assured that, although removed from the scene of his labours, he will continue his exertions in the cause of Indian Literature and Science.

A letter from Dr. Buist, embodying certain propositions relative to the *Malcolmson Testimonial*, which had been previously circulated to the Managing Committee, was then submitted to the Meeting.—Resolved that the two first of Dr. Buist's propositions be adopted, viz.—

1st. That the subscription to the *Malcolmson Testimonial* be closed.

2nd. That one half the sum subscribed be devoted to the purchasing of *dies*, and of *ten silver medals* to be struck from them for distribution by the Society, with such devices and inscriptions as may be considered expedient; and that the details, as to the mode of distribution of the medals, be left for the future consideration of the Committee.

The following donations were presented:

Historical Researches on the Origin and Principles of the *Bauddha* and *Jaina Religions*, by the Author, J. Bird, Esq.

A Fac-simile of a Copper-plate Grant found in the vicinity of Ujein, dated *Sumvat* 1036, A.D. 980. Presented by R. N. C. Hamilton, Esq. Resident at Indore.

The Society's thanks were voted for these donations, and the Meeting was adjourned to Thursday the 9th December, 1847.

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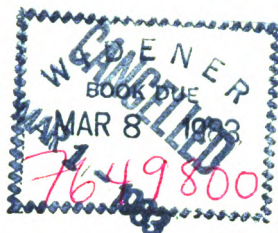
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