

PREFACE.

IN concluding the Fifth Volume of the Society's Journal, the Editor would take this opportunity of acknowledging, with grateful thanks, the assistance he has derived from the different gentlemen who have contributed to the publication since he has had the honour to be *Secretary* of the Society ; more particularly to the Rev. Drs. Wilson and Stevenson, the former *Honorary President* and the latter late *President* of the Society, to whose exertions and willingness at all times to aid in the management of the Society, and the advancement of its objects, independently of their valuable contributions to the Journal, the Society must ever remain indebted.

While availing himself of this opportunity also to apologize for the delay which has attended the publication of the last Number, the Editor would observe, that it has been occasioned by an increase of duty over which he had no control ; but he trusts that ere long the Society will, by the assistance of Government, be enabled to provide against such contingencies, and thus find means of insuring that stability and competence in the performance of its *Secretary's* duties, without which the best endeavours of the Society must always be dependent on chance for a successful issue.

Bombay, 1st July 1857.

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JOURNAL
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ART. I.—*Historical Names and Facts contained in the Kánheri (Kenery) Inscriptions ; with Translations appended.* By the Rev. J. STEVENSON, D.D.

Presented 14th October 1852.

It has been well observed by Mr. Prinsep, that as long “as the study of Indian Antiquities confines itself to the illustration of Indian history, it possesses little attraction for the general student,” and that an interest in this subject is only awakened when there has been discovered some “plausible point of connection between the legends of India and the rational histories of Greece and Rome.”* Discoveries, however, like those he made, form an era in Indian Archæology. Mr. Prinsep gathered the vintage, and has left to others little more than the gleanings of the grapes ; and but for his lamented early decease, his zeal and ardour would not have allowed even these to remain. We have no names of equal interest to bring forward with those already introduced to the notice of the literary public of Europe ; no Chandragupta to identify with the Sandracottus of the Greeks, as was done by Sir William Jones ; no Antiochus engraved on our rocks by command

* Journal As. Soc. Bengal, vol. viii. p. 156.

of the lord paramount of India, as in the case of Mr. Prinsep's discoveries. Still we have names interesting to those who wish to follow up the few recorded facts of Indian history, and come to some definite conclusion as to the persons by whom, the purposes for which, and the time about which those remarkable excavations, known as the Caves of Western India, were executed. And as a connecting point with the records handed down to us by the ancients, we learn something of the religious profession of the sovereigns of the *Validior gens Andaræ*, who, according to Pliny, had in his time thirty fortified towns, and an army of a hundred thousand foot, two thousand cavalry, and a thousand elephants, ruling over the Maháráshtra or Great Kingdom, in an extent to which it again in modern times, under the Peshwas, attained and vindicated its claim to the name it bears.

Apparently the most ancient historical name on our rocks is that of the famous Chánakya, the preceptor and prime minister, for a while, of the above mentioned Chandragupta. He is mentioned under his gentile name of Dámila (*Sans.* Drámila). The name Chánakya is a patronymic, and Kautilya (the crafty), as he is called in the play of the Mudra Rákshasa, is evidently a nickname given him by his enemies. His proper name was Vishnugupta, and Drámila seems to have been a gentile appellation, equivalent to the Sanscrit Drávida, and the modern Tamil,* all of these words being radically the same. In ancient times it is well known that all Brahmans to the South of the Nerbudda were included among the Panch Drávida. When then Vishnugupta left his native town to seek his fortune in camps and courts, his gentile name served him as a surname, in the same way that our French, Scott, Inglis, Cumberland, and many others have become the appellations of individuals. From the two inscriptions in which his name is found, it appears that he was an inhabitant of Kalyána (Callian), and hence not improbably a Koncaní Bráhmaṇ of the Chitpawṇ tribe, who are by far the most numerous class of Brahmans between this and Goa. This is the tribe that, in the Poona Peshwas, gave rulers to the Maráthá Empire, and in Náná Farnavist produced the most celebrated Indian statesman of modern times, and a perfect Kautilya for his crooked policy. In accordance with the traditions about Chánakya's fame and penance, collected by Wilford in vol. ix. of the Asiatic Researches, it is rather interesting to find,

* In the Mahavanso, Dámila is translated Malabarian, though doubtless Hindús from both sides of the Peninsula were included.

† The name of this statesman was Bálají Janárdhan Bhánu, though, like many great men in India, he is seldom mentioned by this his proper name.

that the only two epithets by which he is described in our inscription (No. 15) are "celebrated throughout the world," and "purified." The two inscriptions contain merely a dedication of a cave to the memory of Dámila, without saying by whom. We are left, then, to conjecture that some one of his descendants, a convert to Buddhism, on entering the priesthood, devoted his property to the excavation of a monument to his great progenitor. The name chosen by which to designate him may be considered a happy one, as it contains a compliment to his native land, while pointing to one illustrious man. From the character of the letters, we may infer that the inscription was engraved shortly after the commencement of the Christian era.

The dynasty that succeeded the Maurya, that founded by Chandragupta, and under the third king of which, A'soka, Buddhism became the state religion in India, is called the Sunga. The founder of this royal house was Pushpamitra. From him the appendage Mitra was confessedly given to some, and was probably borne by most, if not all, of his successors in the same line. It is, although common as an adjunct to proper names on the other side of India, by no means so on this; and therefore there is a presumption in favour of any one bearing such a name belonging to the royal family. The word Mitra is the Mihr of the modern, and Mithras of the ancient, Persians. In Sanscrit it means a friend, and is applied as an epithet to the sun, as being in a special manner the world's friend. In our inscriptions it is to be taken in its original, and not in its derivative sense. Thus the proper name Rohiṇi-mitra literally means the friend of Rohiṇi, one of the lunar constellations, and is a name of the moon. Whatever, however, might have been the rank or family of the persons with Mitra forming part of their name, mentioned in our inscriptions, names of members of the royal family are undoubtedly inscribed on the rocks at Kárlén (Carlee). On the obelisk outside the temple there is an inscription, which, when translated, is as follows:—"The chief Agni-mitra (*Prácrit* Agi-mitra), son of the Great King Bhúti (*Prácrit* Bhoti),* erected this lion-crowned pillar." The name of Jaga-mitra also, no doubt one of the same family, is inscribed on the fourth pillar after entering the cave. Bhúti

* In the Mahavanso, C. i. 1, 3, we have *poráno* for *puráno*, and x. 1, 26, 29, *sovarno* for *suvarno*; and *pokkaro* for *pushkaro*, *passim*. In No. 15 of our Inscriptions there is *भो* for *भू*, and in No. 12 *भो* as a common noun for *भू*. See also Vararuchi, i. 6—9, extending the principle to other words besides those mentioned. The inscription would, indeed, seem to give Goti, instead of Bhoti, but as the *g* and *h* are very similar, I suppose that either the original artist or the copyist has missed the small distinguishing stroke.

was then, probably, the excavator of this cave temple.* As from Wilson's Vishnu Purána, and Prinsep's Useful Tables, it appears that he reigned about B. C. 70, the cave must have been excavated about that period. Bhúti was accused of immoral practices, and his prime minister, Vasudeva, murdered him, and ascended his throne. Perhaps Bhúti, like the constructor of the first Egyptian pyramid, and the finisher of Saint Peter's, stirred up a spirit of revolt among his subjects by levies of men and money for his magnificent works, and thus his prime minister was tempted to dethrone him, and usurp the sovereignty.

The most important names on our Káñheri (Kenery) rocks are those of Gautami-putra and Yadnya S'ri-Sát-Karñi, two famous sovereigns of the A'ndhra dynasty of kings,—that mentioned by Pliny as celebrated in his time,—and perhaps also a third, that of Balin, first sovereign of the race. There is much confusion and many omissions in the Puráns in relation to these A'ndhra sovereigns ; yet in relation to the two first mentioned kings there is a pretty near agreement. The names in my copy of the Váyu, which was once the property of Colonel Kenedy, and in the Bramhánda, according to Wilford, agree exactly with the names on our rocks, except that S'ri is transposed, so as to come before Yadnya, which, too, is the usual arrangement. Though the two names follow one another, Yadnya is not said to be the son, but merely connected with Gautami-putra, so that he was likely his grandson. The first of the three kings that reigned between them swayed the sceptre twenty-eight years, and the next two only seven each. These two, then, were in all probability brothers or uncles of Yadnya. The same two names occur again in the same connection at Násik over the cave there most to the right, which is there said to have been excavated by the Commander in Chief of the latter of these two princes. Besides, on the left porch of the great cave at Káñheri (Kenery) the fragments of the inscriptions show that they there also occupied the same position. From the original Prácrit of Guatami-putra, the Bhágavat has by transposition formed Gomati-putra, perhaps intentionally, to conceal the relation subsisting between the A'ndhra sovereigns and the founder of Buddhism, whose family name this monarch bears. The names of these two kings are so very peculiar, no other persons known to Indian history or tradition bearing either the one or the other, that the bare pointing of them out is sufficient to identify them with the A'ndhra monarchs mentioned in the Puráns. It has also been several times noticed by

* True this king in the Puráns is called Deva-Bhúti, but Deva is so common a pronomen and cognomen to kings, that its presence or absence is immaterial.

others, that the latter of the above mentioned kings is doubtless the Indian sovereign mentioned by Des Guignes, who sent an embassy to China, and of whom it is specially remarked that he was of the religion of Fo (Buddha), and named Yuegnai.

Another celebrated historical name inscribed on our rocks is that of Buddhaghosha, who is claimed by the inhabitants of the Eastern Peninsula as their apostle, and whom the Ceylonese affirm translated into Páli, or more probably compiled from floating traditions, the Atthakathá, or comment on the sayings of Buddha, after having, before leaving India to visit their isle, published several works in defence of his new religion, and in opposition to his former co-religionists, the Bráhmans.* Whether he ever returned from Siam and Burmah to India, as the Ceylonese affirm, or not, it was probably before his departure that he was connected with Kánheri; and as he must have lived about the same time with the first of the above named A'ndhra monarchs, he was probably, in union with him, instrumental in promoting Buddhism in Western India.

There has been another name of some historical interest engraved on the Kánheri rocks, which, however, has been obliterated, that of one of the Mahákshatrapas, a race of sovereigns who in the beginning of the Christian era reigned over the country on the Indus and Gujarát, at first apparently as deputies or satraps of the Bactrian or rather Parthian monarchs, but afterwards as independent sovereigns,† who appear to have extended their sway as far at least as Bombay. There is an inscription by a minister of one of them over a cistern at Kánheri, and a whole cave was excavated at Násik by the son-in-law of one of the sovereigns of this dynasty.‡

In one of the inscriptions we have mention made of a Ságarpála, a kind of High Admiral to protect trading vessels on this, named by Ptolomy the Pirate Coast, an appellation it continued to deserve till the English rooted out those nests of sea robbers.

We have the names of Kalyána (Callian), and Wasai (Bassein), and Násik introduced in the inscriptions, and Sopáraga, probably Supa, NE. of Poona, and another town I cannot identify. The hill is called Kaṇha, and is now named in Maráthi Kánheri.

The persons, then, who caused the caves to be executed were cadets of the royal A'ndhra family, goldsmiths of Kalyán and Násik, and other devotees, who on entering the priesthood thus disposed of their property.

* Mahavanso, chap. xxxvii. near the end.

† Journal As. Soc. of Bengal, April 1838.

‡ Bird on the Caves of Western India, pp. 00, 61.

I shall now endeavour to collect the information furnished by the inscriptions in relation to the design of the caves, and the institutions connected with them.

1. The most important of the caves is that called the Chaitya-Griha (*Prácrit* Chetia Ghar), an excavation dedicated to the reception in ancient times of a *dágoba*, the representation of the tumulus or mound erected over any portion of the remains of Buddha, and in later times, when image-worship was introduced, of the images of the sage. It may therefore be considered as the Buddhist temple. In the large cave at Kenery, the one probably alluded to in the copper-plate inscription as the Mahá Vihár, we have at the farthest end a *dágoba*,* and on each side of the porch, in a kind of recess, a colossal image of Buddha, with his left hand raised to his shoulder, and the right with the palm open towards the spectator, in the same way as the Bráhmans of the present day expand the hand when conferring a blessing. This is a favourite posture of images of Buddha, and will be found represented in the first plate of Dr. Bird's work on the caves. There can be little doubt that the two images referred to are those mentioned, in the inscription on the porch, as having been constructed by a relation of the Emperor Yadnya S'ri-Sát-Karñi. Only the small images at the tops of the pillars are in the interior, and, which being inaccessible here, as in Kárlen, could never have been objects of worship, belong to the cave as it was originally constructed. A middle-sized image on the right side, and still in the porch, is expressly said to have been dedicated to Buddha by Buddha-ghosha. There are some smaller images of Buddha, and of several large door-keepers, but all in the porch, and thus it appears, as we shall see more particularly afterwards, when we speak of the chronology, that image-worship was not introduced at Káñheri (Kenery) till the commencement of the fifth century of our era. In all the oldest Buddhist caves at Ellora, too, there are no images. There is only one complete temple cave at Káñheri, a second had been commenced to its left, but remains in an unfinished state. The very small cave to the right may also be deemed an exception, where there is a *dágoba*, as there is also in the refectory of the great cave.

There is nothing in the inscriptions on these caves to lead to the idea, as Dr. Bird supposed, of the intermixture of a Mithraic worship on this side of India with Buddhism. The meaning of the epithet *Mitra*

* *Dágoba* is a Páli and Singhalese word, supposed to be derived from *Dehagopa*, "that which conceals or covers the body." *Tope* is a corruption of *Stúpa*, "an artificial mound."

on our rocks has been already explained, and it has been shown that it is used in its original sense of friend, and does not mean the sun. The Buddhist laity paid, indeed, an inferior worship to the gods of the Bráhmans and other Hindús, but not to any one particular deity above the rest. The only two authentic documents on this subject I have been able to find, are the copper-plate above mentioned, and the inscription in the Buddhist monastery at the top of the Náná Ghát, probably, judging from the appearance of the letters, the oldest on this side of India. In the former, besides Buddha, the following objects of worship are invoked :—Deva (Gods), Yaksha, Siddha, Vidyádharma, Gandharva, Ahi (probably Apsaras), Bhadrá-Púrṇá, Bhadrá Padmi, Kávyá (S'ukra), Vajrapáni (Indra), Vák (Sarasvati), Kánína (Vyás). In the latter inscription there is Indra, Sankarshaṇa (Balaráma), Vásudeva (Krishna), Chandra, Súrýa (not Mitra) ; then a name obliterated, after which is Lokapála, Yama, Varuna, Kubera, the Vasus, Ramá, Lakshmi, Kumári, Vara, Sandheji, (Goddess of Twilight ?) S'ri Sarasvati. All these are ancient Vedic gods, or belong to the two great modern sects of the worshippers of Krishṇa and Durgá.

2. The second class of caves are those which were formerly appropriated as convocation halls, and are in the inscriptions named Bhikshu-Sangha-griha (*Prácrit* Bhikhu-Sangha-Ghar). These halls were used by the priests when they discussed religious matters, and were also places of assembly for listening to the instructions of their spiritual superiors.* In one instance at least such a hall was furnished with seats and couches for the sick to rest upon. In the inscriptions on the porch of the great temple the name of eight or nine persons are recorded ; these probably formed a kind of Pancháyat or Committee for the management of all the affairs of the religious establishments at Kánheri (Kenery) ;—a similar custom prevails at this day in relation to analogous institutions among the Hindús.

3. Intimately connected with these halls were the cells for small companies of priests or individual monks. These are called Bhikshu Griha : sometimes they are cells in the sides of the large caves, and sometimes small separate excavations, entirely detached from all others, and having each a separate entrance. At Kárlén they are mostly of the latter description, and at Kánheri of the former. I think it likely that the word Leṇa, now applied to all of these artificial caves, was first

* A curious set of bronze figures, representing a number of Burmese Rahans listening to their teacher, was lately presented to our museum.

given to these grottoes, and that it is derived from a Sanscrit word which signifies meditation or repose.*

The word Vihár (विहार) which is frequently used, may, I suppose, also be applied to any one of the larger of the above mentioned excavations, but it seems rather to refer to them as tenanted by monks than as mere caves. In fact, it properly means an inhabited monastery, a place appropriated to the pleasurable exercise of religious study and meditation.

4. We have next caves, or portions of caves, devoted to the use of establishments for the supply of residents and travellers with food. These are mentioned under the name they still bear in the country around Annasatra, or its equivalent Satr'sála. Several establishments of this kind are mentioned: if I mistake not, no less than four different such caves are referred to in extant inscriptions. In modern times many Annasatras were established by the Peshwas on the great roads leading to Puṇa (Poona), and those of them that were ancient, and had free (inám) lands for their support, exist to this day. At these establishments only Bráhmans are provided with necessaries, as in ancient times only Buddhist priests were supplied from the refectories. It is the Bhikhús alone who in the inscriptions are invited to come and receive the supply of their wants.

5. Far more frequent mention is made in the inscriptions of establishments for the distribution of water, no less than eight being specifically recorded. Where an Annasatra is mentioned, there is generally, if not always, connected with it a cistern for the supply of water; but there are besides several cisterns not connected with these establishments, as we may reasonably suppose, for the use of those lay visitors who were not entitled to the benefit of the refectories. These cisterns are small tanks of three or four feet wide, five or six long, and as many deep, hewed out of the solid rock on the hill side. They generally are nearly full, and I suppose the water oozes through the trap rock from above, and thus supplies the waste occasioned by evaporation. But there is reason to believe that when the hill was tenanted with monks, there was an attendant present to draw water for the use of visitors, and to fill up the cistern when it became exhausted from the adjoining rivulet, which still exhibits the remnants of broken embankments, showing that the water was dammed back in ancient

* The word is in Pracrit लोण, and in Maráthi लोणे. The Sanscrit word referred to is लयन, from the root ली. See Translation of the Kalpa Súra, p. 107, and the Násik Inscription, No. 13, of Brett.

times, to afford a supply when the tanks failed. In our day it is a common thing in the hot season for benevolent individuals to station a person on the road with pitchers full of water, sufficient to last through the day, to supply travellers who may stand in need of such refreshment. Such institutions are called in Sanscrit *Prapá* (प्रपा), and in Maráthi *Pohi* (पोही). In the provincial Sanscrit of one of our inscriptions, they are named *Panīya Bhájanya* (पानोय भाजन्य), which literally means "a place for the distribution of water." But the name they generally receive in the inscriptions is *Podhi*, or *Pondhi* (पोढी or पोढी), from which the abovementioned Maráthi word is evidently derived. The word *पोढ* or *पोढा*, in the masculine gender, in the same language, means "the small trench made around the root of a tree to retain the water supplied to it from the well or reservoir in the morning for its daily use," and "a small cistern."*

In my copy of Clough's Pali Vocabulary, (Columbo, 1824,) p. 83, (पोधि) *Sondhi* is given for a natural tank or reservoir in a rock. But the reading of our word is too well established from its frequent use in the inscriptions at Násik, and in the other cave districts, as well as at Káñheri, to permit of any change in the orthography being made. The Sanscrit *उद्गः* water, with the preposition *ऋ*, will give a suitable primitive for our word.

6. At one of the caves, the *Chivaraka Káhapaṇ S'ála*, mentioned in Inscription No. 10, there was an establishment, as the name intimates, for the distribution to the monks of small sums of money. The word *Chivara* means a rag, or such a piece of cloth as was considered suitable for the wear of a Buddhist mendicant; and *Chivari*, formed from it, means such a mendicant; but from that and another inscription it appears that it was also the proper name of one of the members of the Karṇi or royal A'ndhra family; and I conclude that the foundation from which funds were supplied for the support of this institution perhaps owed its origin to *Chivari Karṇi*. The copper coin called a *Káhapaṇ* (*Sans. Káráshapaṇa*) was of the value of $\frac{1}{2}$ d. English money, or about a French sous. It was coined till lately in Bombay, and named there a *dhabbú*, and was in value two pice, or half an anna. According to the *Mahavanso*,† one article of the *Wajji* heresy was, that the monks asked the laity, among other things, to give them a *Káhapaṇ*. Among our Jains it would be contrary to rule to ask such a coin, but not

* The English reader must not here think of our word "pond," for although the resemblance is striking, and there may be a fundamental connection, this is not one of those terms which in later years have been borrowed from our language.

† Chap. iv.

wrong to receive it if offered. Was the asking, then, the gist of the offence, or was the rule afterwards relaxed? It could not, when this institution was originated, be heretical to receive what a public institution was established to bestow. At the ordination of Buddhist priests, also, this is one of the things given them, to indicate that they are thenceforward to be supported by alms.

7. Attached to the monastic establishment at Kāñheri there was a garden producing some flowers and vegetables, and surrounded with a fence. In one of the imperfect inscriptions mention seems to be made of a village (No. 12) attached to the temple, and it is singular that rather a large village called Vihār (the Monastery) to this day exists on the road to Tannah, at a distance of about six miles from the excavations by the pathway; some smaller villages are nearer, but they are among the hills, and poor. A large reservoir of water, with a very old embankment, enables the cultivators to irrigate part of their fields in the dry season, a thing, though common enough in many other parts of India, by no means so on this side the Western Ghāts. It is not improbable, then, that the villagers owe this advantage to their former connection with the monastery. The granting of all the rents of a village for the support of religious establishments is still a common thing in India.

8. The most curious fact of all connected with Kāñheri is the alleged existence there in ancient times of the invaluable relic of a tooth of Buddha. In one of our inscriptions (No. 7) the cave over which it is engraved is called the S'āka-datya-leṇa (साकदत्यलेण), the "Buddha-tooth Cave," probably because the relic was there temporarily deposited, while the tope, there compared to the pole of the heavens, in which it was finally lodged, was being prepared. The final lodgement of the tooth was doubtless in the tope opened by Dr. Bird opposite the great temple cave, as appears from the important copper-plate inscription, of which there is a fac-simile in his work. There must be some imperfections in that copy of the inscription, which prevent it being satisfactorily translated throughout; but its general import is not difficult to ascertain, and that no inspector might for a moment miss its aim, the word (दाढा) Dādā in very large letters is engraved at the bottom of it. This word means a tusk, or canine tooth; and it is worthy of notice that it is of this species of tooth that the famous Ceylonese Dalada is supposed to be, though in reality it be no more than a piece of ivory. Conceive, then, what a stirring place this Kāñheri jungle, at present the habitation of tigers and of a solitary Hindū devotee, with his cow and her calf, whose domicile is a hut, and cow-

house a cave, must then have been, with crowds of pilgrims flocking in from Kalyán and all the neighbouring cities. It must then have exhibited a scene unexampled now, except at the public exhibitions of the Buddha-tooth in Ceylon, or at Jagannáth, originally, as I have elsewhere shown to be probable, a place of Buddhist pilgrimage, and not unlikely boasting, too, of some relic of the great founder of their religion. It is proper, however, to notice that Dr. Bird did not discover among the valuables he brought to light anything like a tooth.* It is evident, however, from his narrative, that there must have been access to its sanctum in ancient times by some secret door or passage, as a plate in a character more modern by five or six centuries was found in the same mound that contained the one above referred to; nor is it to be supposed that such a relic was inaccessible to the priests, who so highly revered it. When the Buddhists were persecuted in India it is nowise absurd to suppose that the precious relic, which could be so easily concealed, and as a bit of bone or ivory would excite so little suspicion or cupidity among Hindú sectaries, was removed, while the gold and jewels, which might endanger the safety of the fugitive priest, were left behind. The Ceylonese tooth is said to have been brought from the other side of India to Ceylon, about A. D. 310. It is not likely, however, if the relic were really carried from India, that it would be allowed to be removed while Buddhism flourished; and as our inscriptions prove it still flourished at least a century later, the Ceylonese may have antedated the removal of the tooth, as well as mistaken the quarter whence it came; so that it is not beyond the bounds of probability that theirs may be our identical Kánheri relic. The legends, however, relative to the preservation of the relics of the body of Buddha, given in the Athakatha, cannot pretend to authenticity, and it is probable that the worship of relics, as well as that of images, was but a later addition to the tenets of Buddhism.

It would be interesting if we could positively determine who the architects were that superintended these excavations. The only clue we have to this is the mention three times of an artist at Kárlen and Kánheri, who in one of the Kárlen inscriptions (No. 11 of Bird) is said to be a Greek (Yavan), and in No. 7 of our inscriptions he is called an artist. He is named Dhanuka-kata, or Dhenuka-kata, which I think may stand for Xenocrates, with even fewer liberties than are often taken in the

* In one of the urns dug out of the mound he says there was "a small gold box, containing a fragment of white cotton rag [query, that in which the tooth was originally wrapt] accompanied by a pearl, a ruby, and some pieces of gold."—

transference of names from one language to another.* Was he then a Greek or Bactrian architect who superintended the excavating of the great cave-temple at Kárlen, and did he seek to immortalize his name in connection with these interesting excavations? It has been long understood that those ancient Hindú coins, which have Greek letters stamped on them, derive their superiority from Greek artists; and Dr. Wilson lately told us that he suspects the superiority of the Adjunta paintings to anything seen elsewhere in India, is due to Bactrian superintendence.

The declared intention of the excavators of the caves generally is respect to Buddha, and regard to his priesthood. But at the same time it is worthy of remark that in five of the longer inscriptions, along with these, the removal of the sins of the donor's parents is a declared cause of the establishment of the religious houses.

The languages in which the inscriptions are written are generally various shades of Prácrit, with a few in Sanscrit. The Sanscrit is more or less pure, but as good as moderately learned Bráhmans now generally write. None of the Prácrit inscriptions approach the Páli in purity, and scarcely equal the Mágadhi of the Jain works, and Hindú dramatic poems. They seem all to have been written in purely colloquial dialects, approaching somewhat nearer to the modern tongues than the abovementioned classical languages do. The general principles, however, of the Páli Grammar, are applicable to them all. The rules of Vararuchi as expounded in Lassen's *Institutiones Linguae Prácriticæ* will generally enable the Sanscrit scholar to explain the terms that occur, though the Prácrit has various shades, approaching closer, or diverging further from the sacred tongue.

The characters, too, in which the inscriptions are written, vary considerably, according to the age of the inscriptions—as, for example, in the formation of the letters न and ञ, and also, which is specially to be noted, according to the province of the writer, as for instance in the much greater depth in the Gujaráti character of all the strokes that come below the line, as in अ, क, and र.

The only point that now remains to be touched on is the chronology. In none of the rock inscriptions, as far as I can make out, is there any date, either in words or figures. [Dates at Násik and Cárlee were afterwards discovered, as will appear in a future paper,] but happily this want is supplied by the copper-plate abovementioned, found in

† Most readers are aware of the Wájin Hastin used for Warren Hastings. I was once somewhat puzzled on hearing of a high English authority called the *Sheep*, and not a little amused when I found out that it was the *Chief* that was meant.

the tope opened by Dr. Bird : there plainly in words we read *samvatsare sáta dvya pancha chatúrín sad úttare, i. e.* after the completion of the year two hundred and forty-five ; giving us A. D. 189 for the time when the tope was consecrated, and the precious relic deposited in it. The constellation under which this took place was probably Pushya, bringing us to the latter half of June. This is the period of the great festival at Jagannáth, and of our chief festival at Pandharpúr, the commencement of the Buddhist Wasso, and just at the beginning of our periodical rains ;* and Pushya is the name of the constructor of the tope.

Buddhaghosha left India for Ceylon according to the Mahavanso Chap. xxxvii., in A. D. 410, and therefore the image he set up in the great temple must have been executed some short time previous to that date, as it seems unlikely that he returned to Kánheri after his labours in Ceylon and Burma.

Yadnya S'ri, whose name appears in the porch in connection with that of his relation, who dedicated the images there to Buddha, sent an embassy to China, according to the printed copy of Des Guignes in A. D. 408. But there is in this number evidently a typographical error, as the sovereign in whose reign these ambassadors arrived did not ascend the throne till A. D. 424. The date has, therefore, in our library copy been corrected to 428, (I believe by the late Col. Kenedy,) which, being certainly nearer the truth, I shall here consider the true number.† Let us suppose the embassy of Yadnya, called by the Chinese Yuegnai, to have arrived in China in the second year of his reign, which cannot be far from the truth, as he reigned only seven years ; then, reckoning back by the help of the Radcliffe copy of the Matsya, cited in Wilson's Vishnu Purán, we are brought to within six years of the conclusion of the reign of the great Sát Karṇi, to whom all the Puráns give a period of fifty-six years, as the time when the relic of Buddha was deposited in the tope. If, however, we take the reckoning of that Purán, and begin the A'ndhra dynasty with B. C. 22, we shall be brought into the reign of the Sát Karṇi tenth on the list.

* See for the basis of this calculation Bently's Hindu Astronomy, and Prinsep's Useful Tables, p. 18, part ii. The latest day was June 29th, as the Hindú year began on the 23rd January from A. D. 44 to A. D. 291. As the luckiest day is the earliest, we conjecture the date to have been June 16th A. D. 189.

† The original in Des Guignes, vol. i. p. 45, under the reign of Tai-tçou VEN-hoan-TI, who is said to have ascended the throne in A. D. 424, to have died in 453, and to have reigned 30 years, is as follows :—

“ L'an 408 on voit arriver à la Chine des ambassadeurs du pays de Kia-pi-li (a) dans l'Inde, où est le Mogol, avec des presents pour ce Prince.”

(a) “ Le Roi se nommait Yue-guai. On remarque qu'il suivit la religion de Fo.”

SANSKRIT INSCRIPTIONS.

I.

The most important of the Sanscrit Inscriptions is No. 2 of Mr. Brett's fac-similes, and No. 6 of plate xli. in Dr. Bird's work. It is under the middle-sized image of Buddha in the recess of the porch of the great cave on the right. In Devanāgarī it is as follows :—

बुद्धस्य भगवन् इन्द्रासमान्यकारीति पीडको पाश्चात्
 भद्रेण धर्मचिन्त्य [स्य] शिष्यस्य ब्राह्मणभिक्षुबुद्धवोषस्य
 मद्भ्रातृभक्तो [ः] कुटिबारिकस्य भगवत्प्रतिभेद्य देयधर्मः

Translation.

A religious assignation of an image to the lord (Bhagavan) by the compassionate teacher and venerable monument of religion's disciple, the S'ākya mendicant Buddhaghosha, a sojourner on earth, and a prisoner in the body; the same who composed the institutes of the lord Buddha.

Notes.

The letters in brackets are supplied, where letters seem to have been obliterated. Between का and रो in line 1st Dr. Bird has a letter, and Mr. Brett none. The space seems somewhat large, but on personal inspection I could hardly think that it ever had had a letter engraved in it. The first supplement, especially as the preceding letter is doubtful, does not give me entire satisfaction, but it is the best I could think of.

The word पीडक is here taken passively, and means he who suffers from sympathy with the griefs of others, from पीड in the sense of compassion. प्रतिभेद्य the Brahmins say is not according to the Kaumudi, but the rules were perhaps not then so strict as they are now. देयधर्म it may be as well to mention once for all I understand to mean "a thing dedicated to charitable or religious purposes." In Marathi दानधर्म means charity in the sense of almsgiving, properly "the religious act of giving."

II.

This inscription, which is No. 6 of Mr. Brett's, is imperfect, and the first line so nearly obliterated that Mr. Brett has not attempted to take it. An attempt was made by Dr. Bird, when probably it was less broken, and the result will be found in Plate xli. No. 8 of his work. There the inspector will observe something like the word Kshatrapasya,

and from the form of the letters I have no doubt they belong to the Gujarát type. The language is an attempt at Sanscrit, but can scarcely be called pure. The last line is as follows :—

वसुधि आमात्यस्य जनेरवस्य पानीय माजन्य देवधर्मः

Translation.

The charitable establishment of a place for the distribution of water, by S'ateraka, the Minister in the Bassein province of the Satrap.

Notes.

This inscription is over a water tank, but it appears that visitors had water served out to them. The letters व and यो I particularly examined personally, and think they are correctly given in Dr. Bird's plate.

PRACRIT INSCRIPTIONS.

I.

The first of these, or No. 1 in Mr. Brett's fac-similes, is inscribed on the inner wall of an open verandah-looking place just to the left of the great cave, and which the visitor reaches before he comes to the temple. At the outer edge of this court are two cisterns; in the inner wall there are two excavations, forming small rooms, with raised benches, exactly such as are now in India constructed for the fire-place in cooking-rooms. Over the one of these most to the left is the following inscription :—

कस्त्रिषण सुवणकरस समिदाभस सवसायण पनिक देवधर्म

Translation.

The religious assignation of a cistern, fitted to last a thousand seasons, by Samidábhá, a goldsmith of Kalyána (Callian).

Notes.

The word पनिक is peculiar to this inscription, yet it is evidently derived from पानीय, which is found in the place of it above. The word सवस (thousand) is to be taken as expressive of an unlimited number.

II.

This is inscription No. 3 of Mr. Brett's, and is only a little to the right of the above, over a second small room, similar to the one before described :—

नै नासिक कंसण कनकरस सन देवधर्म

Translation.

Peace. The religious assignation of a refectory by Kaṇaka, a brazier of Násik.

Notes.

The figure Svastika, which I have rendered *Peace*, is a lucky figure among all Hindús, and especially among the Jains. If the Chinese authorities regarding the existence of Doctors of Reason, whose emblem was this mystic cross, before the time of Buddha,* are to be depended on, these could be no other than the Jains, to whose sect, and not to the Buddhists proper, the naked sages with whom Alexander the Great came in contact, and one of whom, Calanus, followed him, evidently belonged. The Jains existed three hundred years before the Buddhists,† and this may have given rise to the double Buddhist chronology: the one being an approximation to the time of Parshvanáth, the founder of Jainism, and the other to that of Gautama, the founder of Buddhism. कंसण is an unusual form for an appellative, but is evidently derived from कंस ("brass"); it may, however, be a part of the name. The word सन is for सच, a place for sup-
place for supplying necessities to mendicants, as before explained. The small rooms apparently were the kitchens, and the large covered space, open in front, the dining room.

III.

This inscription (No. 18) is in one line under a middle-sized image of Buddha, on the screen of the great cave that divides the hall inside from the porch, over the heads of the door-keepers on the left.

ओम् देवधर्मो ये शाक्यदिक्षा वसव दृष्ट

Translation.

To the Triad. A religious assignation to those (or from those) who are eminent among the followers of the S'ákya religious discipline.

Notes.

I have hesitated whether I should rank this among the Sanscrit or Prácrit inscriptions. If the third syllable from the end can be read स्य instead of स, all the other changes may be readily made to reduce it to Sanscrit; the termination at the end also being supplied. The mark for the invocation is a figure, almost, but not quite, a circle, with the tail continued so as to make nearly, in addition, a

* Jour. Royal As. Soc. of London, No. xii.

† Kalpa Sutra, Preface xii. to xiv., and Trans. Royal As. Soc. vol. i. p. 522.

semi-circle, concentric with it: I think it is an ओ, as it resembles not a little that letter in some of the Southern alphabets, and in the Maráthi, as written by children on their sand-boards, for this invocation only.

IV.

N. B.—The inscription No. 4 of Mr. Brett's fac-similes, being much broken, will be given after Nos. 11, 12, and 13, from which it can be so filled up as to convey its general sense.

The inscription No. 5, and iv. of Plate xl. of Bird, is engraved on a small dágoba, cut out of, but not separated from, the left wall of the porch of the great cave, just as one enters. Over the dágoba are three umbrella-shaped figures, rising one above another; and two human figures, leaning upon the second, are laying hold of the third. This is probably a representation of the three worlds, and of devotees escaping from earth to heaven.

The inscription is—

ये अकामाक्षिंस पुनस नेषां

Translation.

(The image) of those who, by religion, have become guiltless and pure.

Notes.

The translation, perhaps, should be "(Dedicated) to those" &c. The ऋ in this inscription has an unusually curved lower limb approaching the form where it becomes circular. Harmlessness would be a literal translation of अक्षिंस, but no English word can convey its force. It is one of the cardinal virtues among Buddhists, Jains, and Bráhmans, and prohibits the killing, or in any way injuring, any living creature.

V.

This inscription (No. 7) is in the first cave on going up the hill from the great cave to the first tier of caves on the left bank of the nála or fivulet. After ascending the steps, however, the visitor must turn to the right, so as to come back again till he is almost over the place from which he started, to find this cave.

विष्वक्कलअणकस नेमस नेलोणक पुनस नेमस ईसिहलस
 सपरवारस मना पितुम
 पयसलेण पोठीपदेयस
 न । अणस निवि वदी गमम
 स फउ सुजेते वलति षवे
 स वासउय सवे वसू कुनरस क
 तिनि सुपटे किम् स से से क
 मठ लय बटुवपल अभिन्नव

Translation.

To the Perfect One. The religious assignation of a cave and cistern by Rishi-hala, skilled in sacred learning, son of Gauliṅaka, of the city of Kalyán, skilled in sacred learning, along with his attendants, to atone for their parents' sins. An inexhaustible treasure is here deposited, and the tooth of the venerable personage skilled in sacred science displays its influence in the holy field under the pole-resembling monument. What then, O! ye monks, who keep the appointed sessions is there distinguished in the workmanship even of Kubera, or in the most splendid apparel? Happy is the man of subdued passions, whether a religious student, or one who has a perfect knowledge of the times.

Notes.

The letters of this inscription are often indistinct, though it is not in the least defective. The ष of सिष looks like a ष, and in the sixth line we have, I suppose, वषू for निषू and कुवरस for कुवेरस. I am very doubtful about these two words, however. पयष in the beginning of the third line I take to be a corruption of प्रयस्य, in the sense of प्रायश्चित्त; वैरस, which occurs so frequently in this and other inscriptions, is the Sanscrit वैरस (Vararuchi i. 34), and should mean the same as वैदिक—"one skilled in the Vedas," but is given in Wilson's Dictionary "a sectarian, not a heretic." There can be no doubt of the correctness of so guarded an explanation, and, therefore, with the radical meaning of the word, it suggests that at one time there were Bráhmans skilled in the Vedas, who were sectarian, though not heretical. But our inscriptions teach us that these were Buddhists; therefore at one time, in the eye of the other Bráhmans, those who joined the Buddhists were not viewed as heretics, more than persons who now become Gosáins or Bairágis, but were merely looked on as sectarian. This supposition, also, is useful in explaining the intercourse between the two parties exhibited in the play of the "Toy-cart." If the reading in the end of the fourth line is correct, it is to be explained from Vararuchi ii. 41, as usual. The word निषि, joined with the epithet अषव, is very frequently used, also, in these inscriptions. It signifies properly "capital stock," and means, as appears from the inscriptions at Násik, Nos. 6 and 7, to have been a sum of money not to be touched; I suppose, except in extreme cases. षड may be derived from षट, a tooth, as षस becomes षसन, and analogously षदः सओ; Vararuchi iii. 64, and ii. 2. वदी is वंस, as राषिः becomes राई. To those acquainted with the Sanscrit the other substitutions, as षमड from षमिड, &c. will readily suggest themselves from the translation. On the last word compare

Esther i. 13, वल्ल being taken for time in general. The से thrice repeated is singular, but it may be intended for खेयस or खो I imagine.

VI.

The inscription No. 8, which is over a cistern, next follows :—

खमलकस खेरणकस
रोहणी मितस पुतस
सुलासदतस पोढी
देय घम णे

Translation.

A religious assignation of a cistern by S'ulása-dat, son of Rohinimitra, a goldsmith of Khamalaka.

Notes.

The name of the abode of this donor is doubtful, and the first letter may be ख or खे : according to either reading, however, there is no place now in existence with which I can identify it, unless it be a town between Satára and Puṇa called Karmala.

VII.

This is No. 9, and of the same nature as the preceding :—

सापारजा नमस
स समि कुपासक
स पोढी देयघम

Translation.

The tank of Samyakupásaka, skilled in sacred learning, of the town of Sopár. A religious assignation.

Notes.

The name of the donor here means “constant devotee.” There is a considerable town thirty miles beyond Puṇa to the south-east, called Súpa, or Sopa, but whether this be the town intended or not I cannot say, yet no more probable identification suggests itself. There is a Rakshasiṇ mentioned in the Ramáyana called दूर्पेनखा, from whom the name of the village is probably derived. In reference to Negam, the term here applied to Buddhists of the Bráhmínical caste who had studied the Vedas, I may further observe that it is quite unknown among the Maráthi Bráhmans of the present day.

VIII.

This is No. 10 of Mr. Brett's inscriptions, and has, from the fracture of the stone, a good many blanks.

[सिध] उपासकस धेनुककटिनस कल्प
 [नक] मजकस ठतथ पवरत्तिकथ सप
 रण भदत बोधकाण पणकाण अतिवासी [ग]
 लेण देयधम पाणीय पोढीच सदाभभो
 रति निकाय सच्च सवेण अतिस च [मगा]
 चतुदिसे भिक्षु सच अच आपुठ [मि]
 बुआ पतिठापित मतपिनर उनीस सब [हारक]
 दित आघय भिक्षुसस अकय निवोच द [ता घम]
 सघण चिवरिक दत व सला साक दत्य ले [ग]

Translation.

[To the Perfect One.] The religious assignation of a cave and water cistern, by Dhenukakati, (Xenocrates?) the architect, for the disciples of the stable, holy, perfect, reverend Buddhist teachers, along with the company of those entirely freed from fear, and also for all who follow the self-denying (Jati) religion. O! ye monks in the four quarters (of the world), now a shelter has been provided for monks [to cancel] the debt of my parents. Come then hither, ye mendicant priests: here an inexhaustible treasure is deposited for the priestly assemblies; here is a hall established for Buddhist priests; here, the Buddha-tooth-cave!

Notes.

The name of the donor in this inscription is the same as that on the Kárlén rocks; the first syllable here has the vowel *e*, it is sometimes *a*. I have previously made remarks on it. The concluding word of the first line, and commencing one of the second, I understand as modifications of कल्पन and कर्त्तव्यन्; the latter is according to Rule iv. 7. The former, however, should be कल्पन. The words of the second line I understand as corruptions of स्थातृ or स्थीत, पविचकृत् and संपूर्ण; though none of them square exactly with the rules.

The word अमभोरति I translate as if it were अर्भभीरतीत. The Jati religion is now a common name for the Jain religion, but in our text it must mean the Buddhist, to which the word may be equally well applied. The idea of debt in the sense of sin is found in the old Maráthi literature, and is no novel expression introduced by Europeans. In Maráthi क becomes as readily उ as इ—दित for hither is Koucáni

Maráthi to this day. In आषय we have the Sanscrit ऋ changed to ष, as in the case of षर. (Vararuchi iv. 39.) After साक, for साक्य, the ऋ is peculiar, and has a turn to the right instead of the circular termination, which it commonly has in this inscription. This I have taken as a ष, which, if it were used, would be marked something in that way. Perhaps it may be the mark of elision, and then the Devanágári should be दृह. Whichever way it be taken, I cannot conceive of any other meaning so probable being intended as that given in the translation. Chivari of the royal A'ndhra family is mentioned particularly in No. 12 of Mr. Brett's fac-similes, our tenth Prácrit inscription, but here I have taken the word as an appellative. (See Wilson's Sanscrit Dictionary.)

IX.

This, which is No. 11, and the next, which is No. 12, follow each other, with a short space intervening, over a small cistern in the porch of a large cave, still on the left bank of the rivulet, and still farther towards the south than those mentioned above :—

सिधं कस्य [गक] वस [यीक सा] यणसवमतस पुतस नेम
 नस घन [नकस उपसकानं] बुधकानं सस्य सवेण परिवा
 रेण पाष [नाय ठापिता] पिल्लेण पाणोय पोढी आसण पेडिका
 घोपाषे अ [येमं] च कमेच देय घन चातु दिसे भिबुसय च
 ति ठापित मातपितरो उदिस सवत चित आषय
 रस्ये अषय निवीच दता

Translation.

To the Perfect One. The religious assignation of a cave, a water cistern, a seat, a cupboard, and a row of couches for the sick. These have been [bestowed] for the sancti [fication] of religious [devotees] and wise men, along with their attendants, by Dharm [anaka] skilled in sacred learning, son of Sayána Sarvamata of Vas [ai] (Bassein), near Kaly [áṇ]. Come hither all ye monks from the four quarters (of heaven) to the house established from regard to the (donor's) father and mother. Come hither from every quarter, for here, too, is deposited an imperishable treasure !

Notes.

The distinguishing of a town from others of the same name by mentioning some other place near it, is very common at this day among the Maráthas. Near the beginning of the third line the transcript has वव, which I have converted into पाव, by the slightest

imaginable change, as will appear to those who know the ancient characters : of the above combination I could make nothing, and the idea of sanctification for the priesthood is common in the Mahavanso. **पेढी** in Maráthi is the small raised earthen or wooden platform on which Shroffs deposit their money. I have conjectured that it is a kind of cupboard, for placing any articles on not in immediate use. **उपाधि** in the contracted form of **उपाध** is common in Maráthi for a tedious harassing sickness. The Maráthás frequently prefix the semivowels **य** and **व** to words opening with a vowel ; in some districts it is done always. **उद्दि** I consider to be **उद्दिष्ट** in the sense of "having regard to," for which Maráthi Bráhmans use **उद्देश करून**. **हित** "hither," **रथ** "here," and **च** "even," "also," are common Maráthi words ; the two former provincial, the last classical.

X.

See for the position of this the last number.

एतोच वासारते वसतस भिक्षुणो चिवरक कदापणा सालस पातेल
 स उपाहन च कदापणा दस किलिं [जक] पडिकमा सेव सभासदा
 तवासे सेणाल्लेण पडि अभित बरालयणे विहारे गंधारिका भूमो
 य बग्गभोजण चातसालस देवधम एते सपिअल्ल निवि दता मुकदसीव
 यिख निवेसण एते वे भाका विग्गभस भाका चातसालस विहारे दसकामो चिवर
 कानी चातसाल सतक

Translation.

Here, in the lofty day and night lodging-place for monks, is the Buddhist mendicant alms-house, in which the use of cooking-vessels is given, also money and mats for the multitudes that attend for the confessional service, during the time of the annual session connected with this cave ; also on both sides of the monastery is ground filled with champaca trees, and swallow-wort, and also a refectory in the outer court ; all a religious assignation. Here, too, is the beloved inexhaustible treasure, the procurer of final liberation, in a most excellent apartment. Here are two charitable establishments ; the square refectory connected with the outer courts of the monastery and the painted square lodging-place endowed by Dasakarṇi and Chivari Karṇi.

Notes.

The word Chivari means a Buddhist mendicant, and is derived from **चिवर**, a rag of cloth, or such a plain garment as a Buddhist priest may wear. In the conclusion it appears that Chivari is the proper name of one of the A'ndhra royal family, whose surname was Karṇi ; but

at the commencement I take it as a common name. In the preliminary observations Káhāpaṇ (Sans. क्वार्षापण) has been already explained. The word पानेले is Maráthi in the sense given in the translation. I have given the Jain meaning of पडिकसन (Sans. प्रतिक्षण,) to पडिकसन, though without independent Buddhist confirmation. The Jains have a regular annual confession, but I have not heard that modern Buddhists have any such custom. They might, however, have had it in ancient times; but if the sense given in the translation be objected to, some such general idea as waiting on religious instruction may be substituted, though that does not suit the derivation of the word so well. The tree and plant mentioned in the text are both highly esteemed by the Bráhmans of the present day—the latter is the *asclepias gigantea*. जने is the sanctuary of a temple or interior of a house. I understand विनर्से as the veranda or outer court. The reading बमम is probably corrupted. Of such corruptions as चिब for ईड and चनक for चिबक I can only say that the former would pass in Maráthi where च is frequently prefixed to vowels, and that in the latter the र is probably obliterated. ने is the modern Guzeráti for two, being the Sanscrit द्वि corrupted. We have here another A'ndhra prince, Das'akarni, connected with the caves. This large monastery still retains some marks of having been plastered and painted.

XI.

This inscription (No. 13) is in a cave on the opposite or right side of the rivulet, a little higher up than the preceding, and nearly in a line with the Gosain's house.

This is No. 14 of Plate xlv. of Bird.

सिधाथ

राज्ज मेतमपुतस सम सिरो यज्ञ सतकणीस [नमकंद] पुत
 न्याग पचतिक वसई कलियण वाचवस मेममस अण
 अपुतस उपासकस अपरेणुस सपरिवारस सच
 कुटुबिणीय आणद माताज वरिडिकाय सच पुसकणी अणदणीठ
 सच चतुकन्या जीअरणा सचेव घमदवच
 सच रते अच बीळ लेण आमपितर लीस
 पावत कणद [से] ले लेण्च कटी चदेव ठाव चाड दिस
 भिक्षुयाथे पडिठापित सच समणी वित आधय ॥
 रते सच अचय निवि दता कासापणा, नसतो नित्य नुरो
 सचसचे वाचये पडिके सते रचय आधपण
 खेतयस खेतजाने मज्जल घने मोळ्यक पत रते
 सघण दतव चिबरिकस दुस कपर्दिक चमसे। फंतुलेका

Translation.

To the Perfect One. King Gotamiputra's imperial (descendant,) S'ri Yadnya Sātakarṇi had a nephew named [Nagakanda] and surnamed Aṇa, who had abandoned the world, and was skilled in sacred learning. By his son Apareṇu, (surnamed) Aṇaja, a devotee, along with his attendants, and also by the most excellent A'nanda, son of the lady his mother, along with Dhulakarṇi, A'nanda's guardian, and four daughters, Hijaraṇa —, —, —, along with Dharmadravya and also —, this cave and screen, destined for worship, were formed and bestowed as a gift in the Kaṇha hill to cover the deficiencies of the (donors') parents; and to be a place for the benefit of monks from the four quarters (of the world). Therefore come hither all ye multitudes. *Peace.* Here is the true inexhaustible treasure, here is an establishment for the distribution of money and the supply of provisions. To the spiritual directors during their session in the rainy season is given to each daily a hundred groats. Here also is instruction in medicine, and at the beautiful spot called Field Town a supply of vegetables. Here is the delight of the assembled priests, the matted-hair ascetic's cooling-herb, useful to monks at particular seasons.

Notes.

The first line, though indistinct, is probably as I have given it, सिषाय ; पुत्र, doubtless ultimately from पुत्र, is the Maráthi word for nephew.* वाचस I understand to be वृषावाच, "living at ease," as वृषावा means "travelling for pleasure" ; but from the Násik inscription it must mean an ascetic. Doubts attach to some of the proper names given, and some are obliterated. The name of Sāta Karṇi's nephew is taken from the next inscription, where it is unambiguous. दिखरणा I would interpret as दिखाराजि, "Queen of the heart." लिस is for लोह, "deficiency," and वाचन for प्राचन, "a covering." वाचये is for वाचये, as काचापण is from कार्वापण, पडिके is for प्रतिके, which is the adjective of कार्वापण in Wilson's Sanscrit Dictionary. अचपण is for आचापन. The मोक्षकपच may be vegetables generally, or the aromatic leaf chewed with betelnut, lime, and cloves, by the natives of India.

The last line, if the words be brought back to their Sanscrit forms, will stand thus:—अत्र संघानंदवान् सिषरी सदृशः कपदिक चमसे कतुकाळे. The चमस is in Hindi called Khetspápadá, and in Maráthi पिचपापडा,

* In this, and most instances where the Maráthi is referred to, Molesworth's Dictionary will confirm what is said, though, residing more than a quarter of a century among the people, and speaking their language, I can speak from personal experience on this subject.

and is cooling and antibilious. In reference to the name कपर्दी, and the votaries of Siva, who wear matted hair, see As. Res. vol. xviii. I have assumed that these sectaries had an existence in the early centuries of our era, which I believe them to have had, though perhaps not then acknowledged, even in the partial way that they now are by the Bráhmans here. For कर्तुका see Wilson's Sanscrit Dictionary. The Sanscrit of the rest will easily appear by supplying the nasals, and changing अ to आ, or *vice versá*, and keeping in mind Vararuchi's rules.

XII.

We are now prepared to examine No. 4 of Mr. Brett's fac-similes, that of the inscription on the left porch of the great cave, as from the last we shall be able to supply enough at least to lead us to its general purport.

This is No. 11 of Plate xlii. in Bird.

राज गोत [नो पुत्रस समचिरो यञ्ज]
 सातकणोत्स [नम कन्द पुत्रस्यस रत]
 श्री पञ्चोपच [रवने उदियान खेत च]
 बाणोज केपिउत्स [द्राय च अन]
 इ.य उपनेवी मा [म पदतं च ख]
 गोतिथेचि मातु [र आमदेम सच]
 माजसेनेमं सच मज मि [ते न सच]
 कापिलेयो चेति [या ठापिता देयधम]
 आचारिया न निका [यान च उपा]
 धियान परिमसेच [सतसाक्षा मा]
 तपितूम असूतिम [पठिठापिता]
 अजेया कुटुंबिणी [या जनि] त बाह
 सब हेतुस भातिनेयि नदि [न] स
 वजस च अगो पठि अ [गति] य सव्यत
 च हित सुख चडे तुदुष चनव
 कालवजिन येरा भदंत अचला भद [त]
 गोपलो भदत विजयमितो भदत वो
 भदत समपालो उपासको च नमकद
 पुन अपरेणु तु समपिता अचरि [यो तु]
 भदत सेहलो भसी गोत उपकारिमान भ
 दता ठठिकेन कण्ठ सेल बंदके परिधित
 सेलि कोटि च केचि नच कडके हरित आ
 कोणा व मिठिकेन

Translation.

King Gota [miputra's imperial descendant S'ri Yadnya] Sát Karni

had [a nephew named Nagakanda, who in the forest] frequented by the feathered tribe [reclaimed land for a field and garden] to obtain groceries and agricultural pro [duce]; and also bestowed the neighbouring vill [age] of An [anga] for the benefit of his kindred; and in union with his broth [er Ananda, and along] with Gajasena and also Gajami [tra dedicated as a religious assignation two] images to Buddha. [Here was established also a refectory] fenced in and adorned with figures of lions, for the company of religious teachers, for the purpose of putting a stop to my parent's transmigration. On account of all the children [descended from] the lady Ajeyá and my brother's sons and family, come ye from every quarter to this mountain house, and enjoy a happy home. Here nine death-subduing priests of established virtue, (Theros,) the venerable Achala, the venerable Gopal, the venerable Vijayamitra, the venerable Bo, the venerable devotee Dharmapála Aparenú son of Nagakanda, and Samapita the religious guide, the venerable Sehalo (Sinhala?) along with a body of other eight venerable priests, filled with great compassion towards the world, reside in the sacred Kanha hill, on whose circumference grows the mountain pepper, which is enclosed with a circle of prickly pear, and filled inside with turmeric, the delight of sages.

Notes.

The filling up of the proper names at the beginning is, I think, placed beyond doubt when we refer to the last inscription, and consider that the letters added exactly complete the line. It will be observed, also, that the name of Sât Karṇi's nephew is taken from below, line 18, where it is uninjured. So much filling up is required, that the translation, beyond the proper names, is not much to be depended on. Yet I think it will be conceded as probable in connection with the word वाणिज्ज for वाणीञ्च and क्वेवि for कृवि. The supplying of ञ to ञ् to make out the word for village is not surely unwarrantable, as in the former and in the Násik inscriptions it is plainly given in full. वापिल्लेयी must, I think, be interpreted as an epithet of Buddha, whose favourite abode, Kapilavasta, it refers to; and the चेत्ति we have had so often for the first letters of the word चैत्त, that little doubt can be entertained of this being the word intended. Among the Jains the word चैत्त applies even more frequently to "an image" than to a temple, though its original meaning was probably a "Dagoba." The lady Ajeyá seems to have been Aparenú's mother, but as Ananda was his Mátája, "half-brother" only, she must have been married twice. भवि I understand to mean भृष्ट, and भोज to be for भूज, as at Karle

King Bhuti is called Bhoti. Some difficulty has been felt with the last two lines, but a comparison of the transcript with the translation will best enable a Sanscrit scholar to judge how far I have hit the sense. I have not thought it of sufficient importance to say anything in its vindication. Besides, except केशि for केशि by an extension of Sutra ii. 43 to other words than those mentioned, the changes are regular.

XIII.

This inscription is more broken, apparently, even than the last. It is on the right porch of the large temple, and one cannot help suspecting that at the time of the Buddhist persecution, both were purposely injured, as large pieces from the stone have been wholly detached. Owing to this circumstance this inscription here begins in the middle. Mr. Brett did not take it at first with the rest, but as it is important in connection with the preceding, I have made a transcript and translation, as far as I can, of what remains ; and Mr. Brett has also since taken a fac-simile of it. It is numbered 10 in Plate xlii. of Bird's.

.....

 [..... दिवा] ख भा संकरसु आलं
 [कृत र] खकस चेति अस ने
 [चे... घन] संकर सचनुषयि मुनया
 [मं.....] अखय निवि दत्ता सोपारक द्वारद
 [र] मोई कालिअणेअ बालिका विहारो चेति
 [अ घ] र पथान साल देवर काणो पति ठाणे विहा
 [य] द मुषस दरिय चेतिअ घर देवर कांतरेस
 स अख निविक [य] अन्त लोक परठाणपथे
 रसणे पुलि कणीय कदर कोठीच वणिता सदा
 सेवा न्याया [घ] रा सघ रामास अखयनिविक क
 राचित प [ति] मा देयघन मोचे अनानि चिरे रतानि

Translation.

The following religious assignations (belong to this locality). Adorned with a radiance vieing with that of the solar rays in the — preserving sanctuary constructed for Buddhist sages, by—, the glory of religion, is deposited an inexhaustible treasure, all-protecting, and delivering from rapine. In the prosperity-ensuring monastery of Balī there is, connected with the temple, the hall for travellers. On the

temple of the glen. There is, near the pleasant road close to the site of the divine Kántera, where the people worship the veritable treasure relic, Dhuli Karqi's granary and store-house. Above all, there are the famed veritable treasure images which sustain worship and virtue, and are beloved by the priesthood, with the hand in the attitude of bestowing blessings. Below there is food ; above there are jewels.

Notes.

The intention of this inscription seems to have been to recite the different institutions at Kenery established by the Karqi family, and to exalt above them all the two colossal images of Buddha, mentioned particularly in the last inscription. Probably it may be possible, by-and-bye, to identify the places here spoken of. प्रतिष्ठाण is written पतिष्ठाण and परष्ठाण ; when applied to the celebrated city of that name the Maráthas write it परष्ठाण. Here it is to be taken as a common noun. The word देवर in Sanscrit means " a son-in-law." In old Maráthi the termination ष was common, and it is still used in respect of some words. It prevails also in the Telinga language, and I conceive र here to be a termination derived from that source, and the word to be rendered, as it would be in Telugu, "divine." According to the Bhágavat, the first A'ndhra sovereign was named Balin, and Balika will then be an adjective derived from that name. I think it probable that he is here referred to ; yet, except for the epithet divine, the name itself is too common to fix anything ; and, perhaps, it will be safest at present not to lay down anything as certain on this head, since Kantera, who has the same epithet, cannot readily be identified with any of the Puranic sovereigns. The concluding part—that which mentions the images—is the most important part of this inscription. कदर is for the Sanscrit कृदर, the क passing not only into रि, but also into उ and अ.

In comparing the transcript accompanying this paper with Mr. Brett's fac-simile lately made, the following differences appear :—

Line 2, letter 1st, अ is given for ञ, and the last letter is न ; line 3, the 5th and 6th letters are omitted, and blanks supply their places ; line 4, the 6th letter is omitted ; line 5, the 6th letter has more of the ञे ; line 8, the last letter is simply ञ ; line 10, letter 3rd, the ञ is more distinct ; in the last line the 5th letter from the end is broken, but must be पि or वि ; the next two have their heads also broken, but must be क or र. Some slight changes in the translation may be necessary if these readings in the second and last lines are adopted.

XIV.

This inscription and the next belong to Chánakya. They are numbered by Mr. Brett 14 and 15.

सिधं कालियनिकाय भिक्षुणीय दामिलाय
श्लेण देय घन

Translation.

To the Perfect One. To Dámila, the mendicant ascetic of Kalyán, the religious assignation of a cave.

XV.

सिधं कलअनिकाय मोरभियाअ
षवर्निकाय दामिलाय श्लेण
[यो] ङी च कण्ठ सेले देय घन ॥

Translation.

To the Perfect One. To Dámila, inhabitant of Kalyán, famed throughout the world, and purified, the religious assignation of a cave and cistern in the Kaṇha hill. Peace.

Notes.

The only question that can arise in regard to these two inscriptions is—do they refer to the famous Dámila, or to some obscure Buddhist priest? I suppose the cave referred to to have been constructed a considerable time after Chánakya's death, as a monument to him by one of his descendants; and as to Chánakya being represented as a Buddhist priest, the collection of traditions made by Wilford respecting him, in the Asiatic Researches, vol. ix., shows that he finished his life as a penitent at the least. The modern Bráhmans, of course, would never allow that such a character became a Buddhist, whatever the fact might be; and one of his descendants might very naturally conclude or suggest that the asceticism of his great progenitor had taken the same course as his own, and had led him to adopt the system of Gautama. It is very unlikely that such a dedication should have been made, and such expressions used, in regard to an obscure priest. The form of the letters, the use of the Sanscrit dative in आय, and च, for which व was afterwards substituted, all point to a comparatively early date.

XVI.

No. 16 of Mr. Brett's fac-similes.

॥ सिधं खेराज भयत मितभतीज
श्लेण सागरपालोत्रय देय घन ॥

Translation.

Peace. To the Perfect one. To the men of established principles, the saviours from fear, and who are content with moderate things, the religious assignation of a grotto by the High Admiral Ugra. Peace.

Notes.

The last part of the first line I would write in Sanscrit thus :—अथ चरितमृतानां. Perhaps the latter epithet should be मित्रमर्तृनां, “the cherishers of their friends.” The figure Svastika is here so formed, that both at the beginning and the end the upper peak should be to the letters.

XVII.

This (No. 17 of Mr. Brett’s fac-similes) is found on the upper part of a small *dágoba*, in a very small cave, a few paces to the right of the great cave, and may very readily be passed, unless the visitor is looking out for it, as it lies a little off the foot-path.

सिधं खेरनकस घसनकस भया अ
नव पासितन कयमय धम
खेरान भयत घम लेण
डव

Translation.

To the Perfect One. The religious assignation by the goldsmith Dharmanaka of a fear-destroying religious grotto, with a *dágoba*, for the teachers of established principles, full of holy deeds, preserved from fear and disease.

Notes.

The use of न for ञ in the word for goldsmith is remarkable, and we should now say it characterized an inhabitant of the northern parts of the Máráthi country, or of the Gangetic provinces. In the second line we have व for च, which is the present custom in Máráthi, especially in the Concan. कय as a corruption of किय्या. In the Kalpa Sútra it is correctly किय्या, but this I think merely a corruption of the same word. In the third line the first letter is च, and not ड, as I ascertained on personally examining the inscription. डव can only be for दूप, the corruption of the Sanscrit दूप, a tumulus, and here applies to its representative the *dágoba*. For the last letter see Vararuchi ii. 14; and although his Rule iii. 12 gives for the first syllable घू, yet in this instance we must suppose a further corruption: in Maráthi it is डेव.

XVIII.

This inscription has not been taken by Mr. Brett. It is No. 20 of Dr. Bird's work, and on the left hand of the rivulet. It is much broken at the beginning, and one or two lines are entirely gone.

.....
 [..... प] वनकस पवजितस
 वमले [ग] पाणीय पोढीव
 [दे] दधम [चाज] दिसमिखस वहाति
 डापिन माता पितर उदिस सब सतन
 पिन अखय असगो च निवाण सभार
 य इत सच अखय निवि

Translation.

The religious assignation of a religious cave and water-cistern by ——— when he was purified and initiated. A house for monks from the four quarters (of the earth) is here established. Come all ye of his race from regard to (the donor's) father and mother, even to the seats for the assembly who seek spiritual emancipation. Here is truly an inexhaustible treasure.

Notes.

प्रवर्जित is a Jain word, that in the comment to the Kalpa Sūtra is interpreted "initiated," in Gujarāthi दिक्षा लिखी. Owing to the imperfection of the inscription generally, and the obscureness of some of the letters, I doubt whether I have hit the idea in the last line but one. The only new word is निर्वाण, a term very common for the final state of bliss among the Jains and Buddhists—among the former, and also among the Nepal Buddhists, meaning a state of supreme knowledge and bliss, probably with separate consciousness; among the latter, or Buddhists proper, cessation from desire, and union with universal nature; for the first principle of the Buddhists, like that of Kapila and Thales, is "an intellect-imbued-matter."

There are still a few more broken inscriptions, fac-similes of which will be found in Dr. Bird's work. They are Nos. 15, 17, 19, 22, 23, 25, 26 of his Inscriptions from the Kenery Caves. None of these have been taken by Mr. Brett. On examining them with some degree of care, I find such words as लेण, मिख, अखय निवी, शिवरिक, क्वापण, and so on, occurring in them, proving that their general import is the same with those already translated. No new proper names have been detected, or any fact elicited, beside those already placed before the

reader ; and therefore any attempt at their restoration would, though successful, be productive of no advantage. These broken inscriptions, notwithstanding, may help to a classification of the different caves, when a plan of them all is executed. The first in the list, however, being in the character of the 7th or 8th century, and much posterior to any of the rest, may admit of explanation, when the Adjunta inscriptions have been examined, which are in the same style. I have written to Dr. Bird to have an exact impression taken for me from the copper-plate found in the tope, which, if it arrive before the publication of this paper, I shall also translate, and add as an Appendix.

APPENDIX.

Not having succeeded in obtaining, up to the end of May 1853, when this paper is passing through the press, another copy of the inscription on the plate dug out of the Kāñheri (Kenery) tope by Dr. Bird, I now give as correct a transcript and translation of it as I am able from plate xlvii. No. 28 of his work on the caves. The inscription is in Sanscrit, and the greater part of it is there sufficiently correctly given for translation. But there are a few places in which, either from the fault of the copyist, or the decay of the original, the characters are so imperfect that nothing can be made of them without some conjectural changes. Happily the words of the date, (with the slight exception of ह्य, which looks like ऋय,) the name of the donor, the names of most of the objects of worship, the fact of the depositing there of a supposed tooth of Buddha, and the erecting a monument to one of his disciples, the points chiefly important in the inscription, with the exception of the name of the reigning monarch, are easily made out ; though some of the imagery, and descriptive epithets, present difficulties in the decyphering of the letters as well as in the construction. I was not aware till I had finished my labours that a translation of this inscription had been given in the Jour. As. Soc. Bengal, p. 97 ; but after a careful comparison I did not see any reason to change anything I had written, (except in the first line to adopt उन्नरे for उन्नते, which I had previously given,) much less to acquiesce in the general purport of that version.

As there are several other topes at Kāñheri, would it not be worth while to open more of them, and see what antiquarian riches they contain ?

[1] नमस्तुभ्यत्रिय । श्रीलपकार्ण प्रवर्द्धमान राज्ये संवत्सरे शतद्वय पंचषण्णारिं
शतद्वये कश्चिदि महाविहारे

- [2] सिद्ध विजयानभ्रमृत आमोकार्णक वासवस्य पुत्र्या : बुद्धपिया पुष्यवर्माना
 आ सुतो दशवत्स वलि
- [3] नो भद्रवत् शशाकमुने स्मृत्यक् समबुद्धस्य तदर्थं आवकाय्ये भद्रवत्तये
 हि परिचरेत्ति कुशल बुद्धवत्तये
- [4] दंतोप्येव परममुने रघय आवकस्याय्या शारदति पुत्रस्य चैत्यं घटित पाषा
 णेषु कान्तिरोच
- [5] नाङ्गाण्येव त्रितिस्थिति सामकाञ्चिनं प्रतिष्ठापितं वासवस्य देव यत्तु सिद्ध
 विद्याधर भद्रवत्तये ऽ हि भद्रा पू
- [6] ण्णा भद्रपद्मो काय्य वक्षपाणि वाङ्कानीनादयः स्वर्गे दिव्यभ्यपिच या
 वद्विचि सवत्स प्रचलति सकरा
- [7] घूर्णोतावत्तिको ऽ यं क्षीरोदः क्षीरौ यो बुद्धो प्रफुल्लिच मुनीषो वा
 पिमेवः यावद्वियान्ति नद्य
- [8] सु विमल सलिलस्य सरान्तोयवत्यः तावत्कीर्तिक्षीरयतु अन्य भ्रमका
 रोसस्यं पुष्यनाम्ना
- [9] दाढा

Translation.

Adoration to the Ever Blessed. During the reign of the fortunate Kripa Kārṇa, on the completion of the year two hundred and forty-five, there was in the great monastery in the Kaṇḥa hill (a son), favoured by Buddha, and named Pushyavarman, of a daughter of a kinsman of the exalted S'rāmī Kārṇa, of the victorious A'ndhrabhrita family. He in a heap of spicery, in a manner due to a noble layman of the religion of the all-blessed powerful hero, the possessor of tenfold might, the lord, the S'ākya sage, the true and perfect Buddha, and also in the midst of a multitude of attendants, while forming at the same time a receptacle for the prospering delightful tooth of Buddha, established a sacred monument for the sage's chief lay disciple, the son of the lady S'āradvati, in the midst of polished stones, a very crystal sea of light and radiance, at a time indicating love, stability, and conciliation.

While Deva, Yaksha, Siddha, Vidyādhara, Gandharva, Ahi, Bhadrā Pūrṇā, Bhadra Padmī, Kāvya, Vajrapāṇi, Vāch, Kānīna, and others venerated by this kinsman, enjoy themselves in paradise, during the thousand revolutions in heaven of the Celestial Dolphin, so long shall this sea of milk, this cow that yields whatever is desired, Buddha, the joyous, the wonderful, the chief of sages, the pole (round which the world revolves), endure. And as long as the liquid streams give birth to the pure water cascades, so long may fame carry down the renown of the benevolent, holy benefactor, born for the benefit of others, and rightly named Pushya (the Protector).

THE TUSK.

Notes.

The reigning monarch at the date of this inscription we have seen reason to believe was the great Sát Karṇi. The surname in our text is equivalent to Karṇi; and perhaps कर्ण, like the कर्ण of the Bhágavat, is no more than a translation of the less common word कर्ण; yet the reading is doubtful, and the letters as they stand would give कूड or कूड. Among the less common names here given to objects of worship, *Ahi* may mean any of the serpent race, Vásuki, Ananta, &c., or a serpent generally. I read first आली, a female friend, and applied this term to the Apsaras—hence an error has crept into the 8th page of the foregoing paper on the Kánheri caves; the Devanágari was amended, and the translation left as it stood at first: this, then, requires to be corrected. *Vách* is Sarasvati; *Kántina* is most likely Vyása; *Bhadrá Púrṇá* is Annapúrṇá. In reference to *Bhadra Padmí* it may perhaps be two names, and mean S'iva and Vishnu; but the reading is doubtful; and if the last word should be read *Pakshí*, as I now incline to read it, then Garuda will be intended. By *Makara* I would rather understand the heavenly S'is'umára than Capricorn, unless this was the first of the constellations at that period, or the one under which the ceremony here mentioned was performed. (See Vishnu Purana, Book ii. c. ix. and Prinsep's Useful Tables, part ii. p. 18.) For वयान्ति of the original, I have substituted वियान्ति, and have translated as if it were वियन्ति from वो, though, perhaps, a suitable sense might be derived from वा with वि prefixed. नीरयन्तु, in the sense of "carry over," used figuratively, which is in the text, is doubtful. प्रीणयन्तु, "love, cherish," &c. would be fully nearer the original letters, but the general sense is not materially different. To other minor difficulties I do not feel it necessary particularly to refer.

ART. II.—*On the Násik Cave-Inscriptions.* By the Rev.
J. STEVENSON, D.D.

Presented 17th February 1853.

OBSERVATIONS ON THE DATES FOUND IN THE CAVE
INSCRIPTIONS AT NASIK.

THE difficulties connected with Indian chronology, it has long been seen, can only be solved by the aid of inscriptions, as the written notices are either too vague or too theoretical to gain the confidence of the inquirer after truth. It was in the hope of throwing some additional light on this, as well as on other subjects, that I lately laid before the Society some observations on the historical names contained in the Kánheri (Kenery) Inscriptions. I was not successful in discovering there any date, although the inscription on the copper-plate dug up out of the tope in 1839 with a date of Samvat 245, corresponding to A. D. 189, in which mention is made of caves being there at that period, throws light on the subject. The inscriptions on the caves at Násik, which I am at present engaged in translating, I find contain five dates. The first, which is in Inscription No. 1, is given at the beginning in words and figures, and at the end again only in figures. In No. 2 there are two dates, but both only in figures. In No. 12 there is one, which is given only in words, and there is one in No. 7. In looking, for the sake of comparison, at the Kárlén inscriptions, I find dates in Nos. 3 and 18, both of them in words and figures, and these the same dates, almost, as in our Nos. 12 and 2 respectively. The figures in all of these are of the same character as those given by Mr. Prinsep in vol. vii. of the Journal of the Asiatic Society of Bengal, plate xx., though not all quite the same. Owing to the smallness of the numbers, I was at first of opinion that these dates had reference merely to the years of the reign of the particular sovereign celebrated in the inscription, and hence of little value; and this is, indeed, the case in reference to the date in No. 12, and the corresponding date of No. 3 at Kárlén, and that also in No. 7. But when I found, on particularly

examining No. 1, that the sovereign Gotamiputra, there extolled as king of kings, and reigning from the Himalayas to Ceylon, and whose queen caused the cave on which the inscription is engraved to be excavated, was a different person from the one whose name is mentioned in the date, I saw my original idea to be wholly untenable. Gotamiputra, whose name is so often mentioned in the inscriptions, was one of the A'ndhra sovereigns; but no name in the least like Pudumáyi, or Pudumáva, son of Vásaava or Vásaiva, from whose years the inscription is dated, is contained in any of the lists of that dynasty. The important question then arose, what is the era here referred to? In casting about for information on this subject, I found that the son of the supposed institutor of the Balabhi era was named Padma A'ditya. It then occurred that the era in question must be the Balabhi. Colonel Tod ascertained from an inscription discovered by him in the great temple at Patan Somnáth, in which a date is given in the Balabhi, as well as in the common Samvat and Hejira eras, that the era in question commences A. D. 319.* Assuming, then, this to be the era of our inscription, the 19th year,—that contained in inscription No. 1 will fall in A. D. 337. Calculating by the detailed years given in the Matsya Purána from the beginning of the A'ndhra dynasty to the first year of Gotamiputra, we find the sum of the reigns to be 340 years.† Subtracting 18 years for the time the dynasty ruled before our era, we obtain A. D. 323 for the beginning of this sovereign's reign. He reigned in all twenty-one years, which will give us A. D. 343 for the last year of his reign, but as the items of these reigns fall short by twenty years of the sum total, we must suppose that the number of the years in some of the reigns has been curtailed, and thus though there were a difference of a few years between the Purans and the inscription, it would be easily accounted for; and though with Prinsep we date the rise of the A'ndhra dynasty B. C. 22, we shall still not exceed the limits of Gotamiputra's reign. Another of the dates, that of No. 2 of the Násik inscriptions, is twenty-four, giving us A. D. 342. No. 18 of Kárlen is the same; Gotamiputra is not, indeed, distinctly mentioned as reigning, but this is to be inferred, and the era is the same as that of the former inscription: we are still, then, within the limits of the Puranic chronology. The second date in No. 2 is only given in figures, but I suppose the years to be 24, from the resemblance the figures bear to the other numerals which have that value.

* Tod's Rajasthan, vol. i. p. 801.

† See Wilson's Vishnu Purána, pp. 473, 474, note 63.

The year, then, of the latter date, will be the same as that of the former, and only the months and days different.

In all of these dates the season of the year, the fortnight, and the day only are given ; so that at that time the Hindus in this part of India did not reckon by months. There were six seasons, each of them containing six fortnights, and each fortnight fifteen days ; but in the Satrap inscriptions, which were probably engraved before that period, months are used, as at present. Although the Prácrit words Pudumáyi and Pudumáva, which are used in the original, are not very remote from Pauma the Prácrit, and Padma the Sanscrit words, yet there is some difficulty in making out Vásaava. Vasudeva and Vásaudeva are names very common among the Hindu kings, and are both famous names in connection with the legends of Krishna. Vásaava, too, is a name of Indra, and Vasu a name of the sun ; and it is probable, that from reference to one or other of these deities, the name was bestowed on the monarch in question. The name Vijaya, which he bears in Tod's Annals, is evidently merely an epithet, meaning "The Conqueror." His proper name probably was S'ridhara, as found in the copper-plate inscriptions.

But what is especially to be noted is, that in the Ayin Akbari, a prince named there Sadrau-senah, no doubt the S'ridhara Sena of Wathen's copper-plates, is said to have reigned at Ujein, and to have succeeded to the throne in A. D. 201. The father of this prince is called by Ferishta Básdeo (Vásudeva), the very name we are in quest of, though removed one generation further back. Ferishta makes him reign at Canouj ; Wilford, however, from a Hindu work named the Vikrama Upákhyána, concludes that he reigned in Gujarát, and that his patrimonial possessions were those of Balhára, or Balabhi. The kings of that race are still remembered in Gujarát as the Gardabha sovereigns, and their money called the *Gadhia Paisa*, or asses' pence.* Little as we might be disposed to trust to any one of these traditions, their concurrence seems only explicable on the supposition of truth lying at the bottom of them. Vásaava, too, as a patronymic derived from Vasu, is equivalent to A'ditya.

To account for the name of a Gujarát sovereign appearing on works executed in the Deccan, we may suppose that the Balabhi kings were at first only, as their names indicate, the generals of the deputies or Satraps of the Parthian monarchs, whose sway extended over a great part of Western India, and who are mentioned as having humbled the

* As. Res. Cal. edn. vol. ix. pp. 149 and 153. I have not, however, been able to obtain a copy of the work mentioned in the text.

A'ndhra or Sút Karṇi kings, in the Girnár inscription decyphered by Mr. Prinsep ;* that by the help of the Sút Karṇi monarchs, about the time in question, they rendered themselves independent ; and that their alliance with the A'ndhra kings was cemented by marriage, the queen of Gotamiputra, who caused the cave to be excavated, being probably a daughter or sister of the Balabhi monarch who established the new era. The probability of this supposition is increased from the writer of the inscription's postscript, in which he states that he wrote the record of Gotamiputra's prowess and glory at the command of Padma, the son of Vāsava, the Gujarát king. Thus, also, the overthrow of the Indo-Parthian kingdom will fall to be dated at the commencement of the Balabhi era, established in memory of that event, in A. D. 319 ; the nominal sovereignty, at least, having been maintained in India three quarters of a century after its extinction in Persia.

The numerals in which the dates in these inscriptions are written are worthy of notice. The years are given according to a system of notation not very different from the ancient numerals explained by Mr. Prinsep in plate xx. vol. vii. of the *Jl. As. Soc. of Bengal*. In reference to the demi-lunations or fortnights, and days, a method is followed which in the main corresponds with that employed in Western India, and all over the country, as far as I know, for fractions of money and weights, as will be seen from the appended table. In the Satrap inscriptions, however, the numerals used to express the different sums of money there mentioned are peculiar. At first I could determine nothing about their origin, but on a more careful examination I found a striking resemblance between the character denoting a thousand (Sahasra) and the Bactrian S reversed. This induced me to examine the rest of them, and I think it exceedingly probable that they are all derived from that source. The Bactrian *Tz*, pronounced in Sanscrit *J* or *Dsch*, will represent well the figure, which is first in 15 or 10 (*Dasha*). The sign for 5 (*Pancha*) is the *P*, or the old Indian ५ inverted. The Bactrian double *T* also approaches very nearly to the 8 of our inscriptions, as if to denote ४८ . It would appear, then, that the Bactrian letters had been introduced into the Satrap Indian inscriptions as numerical cyphers. The system, also, is the ancient Roman and Greek one—that in which there are different signs for the 1 in tens, hundreds and thousands ; our present decimal notation being, as I have noticed elsewhere, a comparatively modern invention of the Scindian merchants of the middle ages. (See *Jl. Royal As. Soc. Bombay*,

* *Jl. As. Soc. of Bengal*, vol. vii. p. 341.

vol. iv.) Future research will probably show, as Mr. Prinsep has done with a few of them already, that the old Indian numerals are also ancient letters.

OBSERVATIONS ON THE NASIK INSCRIPTIONS, WITH TRANSLATIONS.

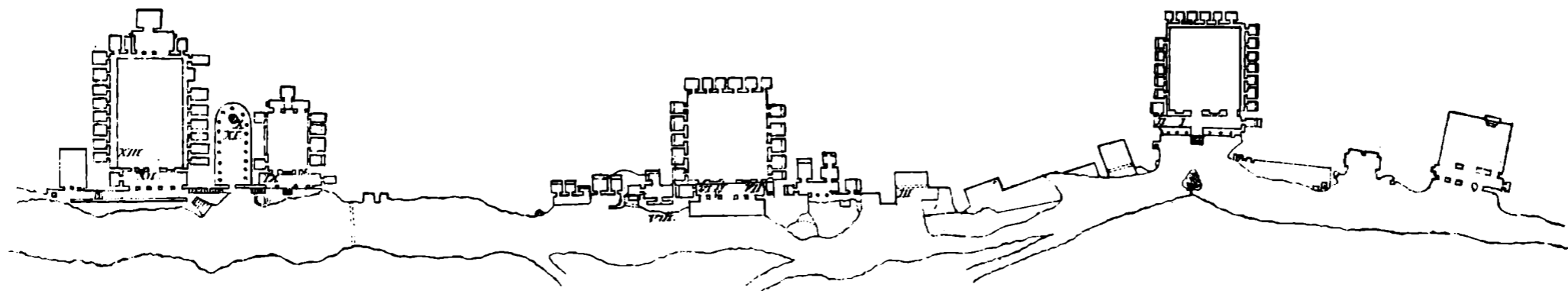
[Presented 17th March 1853.]

There are three principal caves at Násik, each of them containing inscriptions of considerable historical importance. The other smaller excavations and their inscriptions are of less interest, although they supply one or two facts. The first of those caves—that most to the left—was excavated by order of the queen of Gotamiputra, the celebrated A'ndhra monarch, mentioned before in connection with the Kánheri (Kenery) inscriptions. We have in Inscription No. 1 first an eulogium on this king, and next one on his queen. In the former the extent of his empire is described, in which several of the Eastern and Western provinces are specified; while the Pariyátra, the Sahyádri, the Malaya, the Mahendra, and Himálaya mountains, are said to bound his empire. At the same time he is said to have reduced to subjection the sovereign of Ceylon, and driven back the Scythians, Greeks, and Persians; probably in aid especially of the Balabhi sovereign who established the independence of Western India by shaking off the yoke of foreign domination. At his capital city, which, however, is not named, four great institutions are said to have been supported by him—one, a hospital for the sick and infirm, a second a school for archery, a third an institution for Buddhist learning, and the fourth a Brahmanical college; presenting us with a most interesting picture of a humane, enlightened, and liberal government. This is the inscription, as before mentioned, that is dated from the Balabhi era, and particularly interesting, also, on that account. The second inscription is a deed of sale by the original proprietor to Gotamiputra's agent, in which he makes over to him in perpetuity, in a legal style that would not disgrace Westminster Hall, all his right in the field in which the cave is excavated, for the consideration of three hundred rupees. This document is valuable, as demonstrating the just principles of government in regard to private property acted on by those monarchs; and shows that the English were not the first who, in India, compensated individuals whose property was required for State purposes.

The inscriptions marked 4, 5, 6, 7 are inscribed on the central cave of the group, and show it to have been excavated by the son-in-law of

one of the Kshatrapas or Satraps of the Parthian monarchs, who, about the commencement of the Christian era, reigned over Western India. The Kshatrappa's name is Nahapána, and the sovereign's Kshaharáta. Neither of these names is Indian. The latter, however, is not unlike Phrahates, and may not improbably be intended for the fourth Parthian monarch of that name, who reigned about the year B. C. 22. The son-in-law named Ushavadáta, son of Dinaka, was evidently from these names a Hindu, and was the general who fought his battles for him—a fact worthy of notice, in connection with the rise of the Balabhi monarchs. His wife, too, named Dakshamitrá, had no doubt an Indian mother, who might not improbably be connected with the royal Sunga family, shortly before that time reigning in Magadha, and whose surname was Mitra. It might, perhaps, be deduced from the Inscription No. IV., that Ushavadáta succeeded his father-in-law; for after mentioning an expedition of his into Malabar to aid the Kshatriya (Nair) rulers, against the rebellious natives of the province, he is said to have had the ceremony of Abhis'eka performed at Pushkur (Pokhur); yet the ceremony in question might mean no more than a kind of special thanksgiving for victory. In No. IV., from whence these historical facts are deduced, he is said to have been most liberal in his largesses to Brahmans, at Prabhás, and others of their holy places; while, from the other inscriptions, he appears to have been even more profuse in his donations to the Buddhist priesthood. The large sum of a million of gold mohurs, equal to a million and a half of English money, is said to have been devoted to their support. These are the inscriptions that contain the curious numerals, derived, as I apprehend, from Bactrian letters, as before mentioned. No. IV. also acquaints us with the important fact that Malabar was a dependency of the Indo-Parthian Empire; and thus probably the *Huna* coin was introduced into the peninsula. The farthest distant cave of the whole group, that most to the right, was excavated by order of the wife of the Commander in Chief of Yádnya Sri, the descendant of Gotamiputra, who, in 428 of our era, sent an embassy to China. As this cave was made in the seventh year of his reign, it may probably have been excavated in A. D. 433, or fourteen hundred and twenty years ago. It is, however, to be recollected, that there is a discrepancy of 42 years between this chronology, founded on the records of China, and that derived from Puranic calculations (page 36), which would give A. D. 391.

The other caves have on them the names of provincial chiefs (Ráya) or ascetics, of whom we only learn that the excavations in question were executed by them for Buddhist priests.



F.F. Brett. del.

*The Numbers from one to thirteen show the situation of the
Inscriptions which I have numbered in the same manner.
F.F. Brett.*

Scale
0 10 20 30 40 50 60

PLAN
of the
CAVE-TEMPLES
at
NASSICK.

On the whole, we find that Bráhmans and Buddhists, in these early years of our era, lived in peace with one another, and were both favored and protected by the reigning sovereigns ; and that among the former the Sanscrit language was used in writing, and the Prácrit by the latter ; the two languages, probably, holding the same place to one another that the Sanscrit and vernaculars do at present. The Prácrit, also, had different dialects ; and Incriptions Nos. V. and VI. contain substantially the same thing, repeated in different words, being probably written, one of them in the language of Gujarát, and the other in that of the Deccan, dialects which seem even then to have differed, as they do now, though in a less degree. No. II. also repeats its story in different words, probably for the same reason.

[N. B.—Letters supposed to be obliterated are enclosed thus [] ; those substituted for letters supposed erroneous thus ().]

INSCRIPTION NO. I. IN DEVANAGARI.

- [1] सब [ज्ञस ?] राज्ञो वासिवापुतस सरो पुत्रमायीस समहरे एकूनेदीस
१९ जिम्हान पखे वितोये २ दिवेसे तेरसे १२ राजराज्ञे मोतम पुतस
चिमविति मेव
- [2] मद्र पवत समसरस असक असक मुडके सुरठ कुकुरापरत अनुप वि
दम आकरावतिराजस विप्रहवत पारिचात सच्च कण्हजिरि मच
सिरीठन मलय मचिद
- [3] सेठ गिरि चकर (क ?) पवत पतिस वराज लकमडलपति महित सास
नस दिवसकर वर विबोधित र (क ?) मल विमलस दिस वदनस ति
समुद तयपित वाहनस पडिपूण चदमदलस सिरीक
- [4] पियदसनस वर वारण विकस चाव विकमस भूजगपति भोगपीनवट
विपुल दिघ सुद [स ?] भूजस अभयोदक दान कौलिन निभयकरस
अविपनमानु सुसुसारस सुविभत तिवग देस कालस
- [5] बेर (रि ?) जननी विसेस समसुख दुखस अतिय दपमाने मदनेस सक
यवन पल्लवनी सूदनस घमोपजित करविनियोग करस कितापराये
५ पि समुजने अयाणचिसाबचिस दिजावर क (कु ?) टुव विवघ
- [6] नस चक्रातयेस गीरविसेसेकरस सत वाहन कुलघस पतिठापनकरस
सवमंडला भिवा (व ?) दित च [र ?] गस विनिवतित चातुवगस
करस अने कसे (स ?) मरा वजित सतु सचस अपराजित विजयप
ताक सतजन दुपघसजीय
- [7] पुर वरस कुलपुरिस परपराजत विपुल राज सदस आजमान [य ?]
लयस सपुरिसान असयस सिरीय अधिठानस उपचाराज पभवस
रक कुसस रर (क ?) घनुसरस रक सूरस रक वण्णस राम
- [8] केसवे जुम भोगसेन तुलपरकमस ज्ञगयमघवसमाजकारकस गभान नकुस
जनमेजय सकर (कारि ?) यथाति रामावरिस समनेजस अपरिमित

मह्यम चित्तम मुत पचमम र (व ?) द सिध यम् रक्षस विजाध र भूत
मय्य चारण

- [9] अद् दिवाकर नक्षत नक्ष विधिण समरति मुपि जितरिपुसघस नाम
वरद् भुवन्न तल्लमभिविन्नादस कुल्ल विपुल्ले सिरिकरस सिरि सान
कणिस मानुय महःदेवीय ज्ञातमिय वल्लसिरीय सच्चवचन दान क्कमा
विष्सा निरताय तपद्दामनीय
- [10] पापवसत पराय राजरिसि वषुस उमखेल मनुविमयमानय कारित
देयवम.....सिक्करस दिसेवि (ति ?) र (क ?) ण्ण पवत सिठाय
विमल्ल वरनिचिसेस मच्चिपीक लेण रत च लेण महादेवी म्हााराज
नानु म्हााराजपतामची द्द्वानि जिक्कायस म्हा वणिथिन मिक्कु सघस
- [11] रतस च लेण पविनण निमतेा महःदेवीय अयक्काय सेवक मेा पियका मेा
चण...पडेसिरो विणिपतियेदु चम सेतुस रदा [विराजि ?] त ज्ञोमतर
(क ?) ण्ण पवतस अपर द्दक्षणपसपि समपादुक्क सबजात चानिक्क प्प

Translation.

To the Omniscient. In the nineteenth year (19) of the second month (2) of Summer, on the thirteenth day (13) of the fortunate Padma, son of king Vāsava, (this religious assignation was made by the queen) of the king of kings Gotamiputra, whose sway as universal lord extends beyond the Himālayas to the Meru and Mandara mountains ; and who possesses the large revenue-producing realm, with its united provinces of Muṇḍaka, S'aurāshtra, Kukura, Aparata, Anupa, Vidharbha ; who is lord of all the circle of mountains, of the Vindhya and Pariyātra, the Sahya and Kanha hills, Mancha and S'ristana, the Malaya, Mahendra, and S'reshtagiri mountains. To whose commands Varāja, lord of the circle of Lanka (Ceylon) submits ; who is venerated in the region of pure lotuses, where Súrya went at the suggestion of Chháya (Uttara Kuru), whose prosperity and beauty are admired within all the circle of the three seas, filled with the three liquids, and even within the whole lunar orbit, uniting beauty and heroism, showing himself a hero both in taking up and defending his position ; possessing arms like the body of the serpent monarch, muscular and round, large, long, and beautiful ; who delivers his captives from fear by pouring on their hands the water that betokens security ; whose mother is spotless, and sister irreproachable ; highly favoured in respect of the three objects of human pursuit, and of country and time ; having his forehead adorned with saffron and the imperial pigment ; who maintains his equanimity in pleasure and pain ; a Kshatriya, flaming like the god of love, subduing S'aka (Scythians), Yavana (Greeks), and Pahlavani (Persians) ; spending in charity the revenue he had justly acquired ; inclined to spare the lives of good men,

even when they have committed a crime ; promoting the increase of the families of high and low ; who could prognosticate from birds, from the aspect of the heavens at night, and from dress and water ; who has established houses for charitable refreshment, and stabling for cattle ; at whose feet the nobles from all the provinces come to bow down, and before whom the four mixed castes prostrate themselves ; who is surrounded by a priesthood, with minds subdued by self-denying rites ; whose unsubdued victorious ensign, blessed and consecrated by solemn ceremonies, is held up by a virtuous standard bearer ; who has a numerous royal council of men of noble birth, virtuous, and of ripe intellect ; who adheres to law and equity, and is the asylum of good men ; who has established in the fortunate capital (four) institutes, one for the sick and infirm, one for archers, one for Buddhistical learning, and one for Bráhmancial literature ; whose might is equal to that of Ráma, Kesáva, Arjuna, or Bhímasena ; who celebrates festivals, performs sacrifices, offers oblations, and makes feasts ; possessed of a glory equal to that of Nabhága, Nahusha, Janmejaya, Vikramáditya, Yayáti, or Balaráma ; whose fame resounds from pole to pole, and whose praise is celebrated by the unbounded, indestructible, incomprehensible, astonishing, five-clawed (Garuda), the Rudras, Siddhas, Yakshas, Rakshashas, Vidhyádharas, Bhútas, Gandharvas, and Cháraṅs, along with the equanimous, appetite-restraining, passion-subduing company (of Rishis), who inhabit the moon, sun, stars, and planets ; who is of the numerous fortunate family of S'rí S'áta Karṇi. It was Umákhelá, his chief queen, and matron of the family, allied to Gotama and Bala S'rí ; imbued with truth, bounty, mercy, and patience ; remarkable for her austerities ; who had overcome sin and disease, and was worthy of a reverence equal to that of the wife of Manu, that caused this religious assignation to be made. . . . (Come) in the direction of the illustrious peak of the Kaṇha hills, to the queen's grotto, clean, and beautifully gilded. This cave her majesty the queen, and the mother of his majesty, and the grandmother of his majesty, give to those worthy of praise and veneration—the mendicant priesthood. Here there is also for the holy men who inhabit the cave a pleasing, amiable band of attendants, supported by her venerable majesty the queen. On this cow-pasturing Kaṇha mountain, forming a religious bridge for the moon, the husband of Rohini, and (illustrated by the Buddha)-tooth, situated in the South-west region, is a cave having the impression of (Buddha's) feet, placed parallel to each other, and open to all classes.

4 ★

Notes.

I have inserted in parentheses, formed thus (), several letters, in

substitution of those in the preceding inscription which I suppose erroneous, when the error was of importance enough to require notice.

After the chronology, which has been already discussed, the most important thing in this inscription is the geography ; and in this Wilson's Vishnu Purána will furnish all the light that can be thrown upon the subject, for words not found in the dictionary. The first province, *Muṇḍaka*, probably designates Bengal. It occurs as *Maṇḍaka* in the *Rámáyana* among the Eastern nations. (*Vishnu Purána*, p. 193, n. 132.) *Sauraráshttra* probably included all the Southern parts, if not the whole, of Gujarát ; and *Kukura* is the territory of the *Yádavas*, that is, either the country about *Mathura*, in the North-west, or the Peninsula, since authorities differ on this point. The word occurs twice in the *Mahabhárat* list, and thus was most likely applied to both districts. (*Vishnu Purána*, pp. 187, 193.) *Aparata* was probably the country of the *Aparytae* mentioned by *Herodotus*, lying somewhere on the banks of the *Indus* (*Vishnu Purána*, p. 189, n. 60.) The *Anupavritas* are mentioned in the *Mahabhárat* next to the *Marubhaumas* ; and from the connection with *Vidarbha* (*Berar* and *Khándesh*), it likely refers to the countries on the *Nerbudda*. It is evident, then, that only distant provinces, most of which were probably ruled by dependant kings, are here mentioned ; the central *Magadha* is supposed to be too well known to require notice.

It may be observed that there is no king mentioned in the *Mahavanso* with whom the sovereign of *Ceylon* here noticed can be identified. There is, however, an ancient name, *Vara*, of *Ceylon*, among the *Buddhists*, from which it may have been derived, and applied as a general term to *Ceylonese* sovereigns. (*Mahavanso*, vol. i. p. 91.) The first mountain called *Viprachhavata* must be the *Vindhya*, and the name allude to the passage of *Agasti*. The next mountain, *Paricháta*, must also be the *Paryátra*, or Western portion of the *Vindhya* chain. The *Sahya* is the Western Ghauts to the South of *Bombay* ; and the *Kaṇha* would seem to be the hills about *Násik* and *Kenery* in the Western Ghauts and the spurs that branch out from them to the North of *Bombay*. The first place where the legends about *Parshurám* commence to affect the names of places is at *Parshurám Kashetra*, to the South of *Bombay*, ninety or a hundred miles, near *Chiploon*. A hill on the Ghauts close by is mentioned as the place whence he ordered back the ocean, and made the *Concan* habitable. Similar legends are repeated further to the South, and applied to other localities, but none to the North of us ; and it is from him that the term *Sahyádrí* is derived. The *Malaya* mountains in *Malabar*, and the *Mahendra* in

Cuttack, are too plainly designated to require any notice here. The S'reshtagiri, too, is probably Kailas, a hill in the Himálayas, but the Mancha and S'ristana are not so easily identified. Perhaps the words should be joined together, and the compound word applied to the Nilgiris, the only important hill that comes between the Sahya and Malaya mountains. The general order in which the mountains are named almost forces us to this conclusion. Mancha means a table, and S'ristana the breast of the goddess of prosperity ; and any one who has looked at that detached mass of mountains with its peaks at a distance, and ascended to its extensive table-lands, will hardly consider the name when applied to the Nilgiris far-fetched for a Hindú. In some of the other inscriptions, however, the Mancha as well as the Kaṅha hills are identified with the Ghauts that contain the excavations and inscriptions ; and this may be the case here also. The three seas here are probably the seas of salt water, fresh water, and the frozen ocean, metamorphosed by the Hindús into the Sea of Milk. These are the only ones which can lay any claim to antiquity ; the other four are inventions of the prurient imaginations of the modern Puránic writers. The ancient Jains, when the Kalpa Sútra was written, B. C. 411, three quarters of a century after this inscription was engraved, had only two seas, that of salt and that of fresh water, and three continents. The castes at the period in question seem to have been but eight, four pure and four mixed. Those who have not been in India may require to be informed that the most insufferable kind of abuse among the natives is that of a man's mother or sister. Among the deities mentioned in this inscription, the ancient Vedic gods appear, and the sages who inhabit the sun, moon, and stars ; but there is no trace of anything like Mithraic worship. All here named agree entirely with what was previously observed on this subject. The term Govardhan is in this inscription, as in others, applied to the hill whence the caves are excavated, but I have translated it here as an appellative. The last line to me is rather obscure, and I am not quite sure that I have hit the idea. Yet I think it not unlikely that most of the distinguished Buddhist places of pilgrimage boasted of a tooth or other relic. The construction of the greater part of this inscription is not difficult, and I must leave it to the judgment of others to determine how far I have given the meaning. The length of these inscriptions would make an analysis like what I gave in the case of the Kenery ones tedious, and perhaps uninteresting to all for whom it can be necessary.

A supplementary inscription in a smaller character, with the lines a

good deal broken, follows. Of this Mr. Brett has taken a copy, but not a fac-simile. I can only make out enough of it to see that it is an explanation of the above, or such a supplement to it as is common in the Násik inscriptions. It has the same date, but the date is given only in numerals. A river named अईरक is mentioned in it, probably as one of the boundaries of the field mentioned in next inscription, and the name of the rivulet that runs past the caves towards Násik. It is specially to be noticed, however, that the writer names Padma, in whose 19th year the inscription is dated, as the sovereign by whose command he acted. His words are नक्षकरसस वसिषिपुतो सिरिपुदुमावि अनपयंति. This shows clearly that there must have been some family connection between the Gujarát king and the Indian monarch, or he would not have permitted the name of a foreign sovereign to figure in the way it does in this inscription.

No. II.

- [1] सटा तास्यवजवय जोवधमस पनकटक सस जोतस पु
ते सिर सद्धने
- [2] अननतयेत जोवधने असस वतपासिताधमे कपर कसद्धय खेत अ
ज कासुरिप असमदतेन भत निवचर (ण ?)
- [3] सतानि १०० एते अन्ध खेत . . वतन प (स ?) तान १०० एतेसे पव
जितन तरिरसम वितरम एतससस खेत सपरिवरो
- [4] वितराम अपमस अणामस अलो . . पारादिर (क) अरठास विमय
क सवजन परिहारिर (क ?) व एत सोम परिहारिदि परिपे [णे] सि
[5] एतससस योत हारिपरेच एध निवससप अवसने अनत अमविम
सेव खेतीन जतो मससमिध सि उपरे खितो
- [6] दता उत्तरा सवद्धरे १४ . . वसण दिवसि तापसम रठ
ते सिद्ध जोवधने अससस सामकस देया राजनिता
- [7] राज जोतस पुतस सवकणस म [न] दमियस जीव अतोप रजमतुय
वचनेन जोवधने ... ससमका अरोमसतय सवठवच
- [8] वच एय अमपि पततेति ... न्द अन्ध ससदाने लोण पताव सताम पवजि
तान भिक्षून जमे रसदिसु पुवखेत दत तपेखेम (त)
- [9] वेकसभस च जमो नवसति एधसति यजारि एय नगर सोम रजर (क)
खेते अन्ध सतक भते एतेस पवचितम भिक्षुन ते रणु ननदसपि
- [10] खेत सनिव तण सत १०० वसस खेतस परिहार वितरम अववेस अने
मस अन्यन खादके अरठस विनेयिक सवजात परिहारिकद (च)
- [11] एतोचिन परि अक्षिप [रे] खेर . . एतवस खेते परिहारोच एय निवधा
पठ अवियेन अगत परिहार खिय सटाय मतो लेखापी वेद्धरे १४
- [12] उत्तान पखे ४ दिवसे पचमे ५ पजितिना रेटा खेववा निवपा सवद्ध
रे १४ मियेने पखे ६ (?) दिवसे १०

Translation.

— I, the proprietor of Govardhan, at the command of Gotami-putra Sri S'át Karṇi, have made over this field on the elevated Govardhan, which is mine by law, and secured to me by sacred rites, and is covered with wild fig trees, creeping plants, and other herbs, to Rishavadatta, who desired to possess it, having paid me the purchase money, three hundred, 300 (rupees). I have made over this my field for three hundred, 300 (rupees), for those who, having abandoned the world, have crossed the ocean of its fascinations. I have given up this field with all its appurtenances, without any subterfuge, in perpetuity, without any cutting off or remnant, not liable to seizure by Government, by no class of men, to have any claim made on it; free from all such drawbacks in seizure and sale; also all that is connected with it in possession; and the agreement concerning it is for perpetuity, without guile, and with due consideration, cut out by a sharp instrument on the house for the religious assemblage. Given in the modern era 24, during the ... demi-lunation, the ... day, by Rashtra, the ascetic. Peace. To the Perfect One. The assignation deed of the high land belonging to the Buddhist ascetic on Govardhan, and the health-giving asylum for Buddhist ascetics, and the glorious refectory established on Govardhan, at the command of the mind-subduing, satisfied with life, royal mother of king Gotami-putra S'át Karṇi, who observes the laws of the State. Here in this uncultivated tract of mine is our religious assignation of a cave for the mendicant priests, who abide in this place, after having abandoned the world. It is the Eastern field, in the Northern part of the village, that is given, and this field is intended as a residence for the assemblies which meet for discussion, and also for silent ascetics. Here also is a house for divine worship. Here, too, close by the city limits, at the washerman's field, is our charitable institution for the mendicant priests, who have abandoned the world, and for those of established virtue. The purchase money of the field was three hundred, 300 (rupees); and this field I give over in full possession, without any deceit, for ever. No part of its produce to be consumed by any other, nor to be taken away for Government purposes, and with it no class of men may interfere. Without any such drawbacks, I give over the field in possession and seizure. And this agreement in reference to it, for perpetuity and to prevent deceit, as an everlasting deed, has been written by me Rashtra, in the year 24, in the 4th demi-lunation of spring, on the fifth (5th) day. The excellent venerable lady's prosperity-bringing rites for the

departed spirit were performed in the 24th year, in the 6th (?) demilunation of the winter season, the 10th day.

Notes.

This inscription is evidently divided into two parts, the one of which is little more than a repetition of the other in a different dialect of Prácrit, but both contain several uncommon words, such as अमच, *quasi* आमच, at the meaning of which I have guessed through the Sanscrit roots from which I suppose them derived. Independently of these words, however, the general meaning is easily educed, and the sense cannot materially differ from what is here given.

The first part of the first line, in which the invocation might be expected, is so broken, that I cannot make it out satisfactorily. The corruptions of S'at Karṇi, the first in the last word of that line, and the other in the third word of the seventh line, teach us what we are to expect in reference to other words. The learned reader will see from the translation what Sanscrit words are supposed to be corrupted in this document. Rishaba-datta I suppose to have been the imperial agent for this affair. After the three hundred I have supplied rupees, as most probably understood: if any other coin had been meant, it would most likely have been expressed; and the sum now mentioned would have purchased a good piece of ground in that barren locality. If I am right in the explanation of the concluding sentence, which has nothing corresponding to it in the first part, it must have been added at the death of the Empress dowager.

No. III.

This inscription is found on a small cave between the Empress' and Satrap's cave. It is as follows:—

- [1] ॐ सिध वरतुषपनिष नेत्रमस लेण
 [2] अये धम कुटुबिणीष वसनद सरिय देवरको दधुतु
 [3] य चदपुरे सदतव देवरको एव लेण चतु मुतु
 [4] नियुत भिक्षु सषस चानु दिस्स जियाचत ॐ

Translation.

Peace. To the Perfect One. The cave of Brihaspati, skilled in sacred learning. The fortunate Devarko, son-in-law of the fortunate religious lady Vasananda, of the city of Chandrapura, and Sadatava Devarako, bestowed this cave upon the four families of devoted mendicant priests, from the four quarters of the world. Peace.

Notes.

Chandrapura here mentioned is probably Chandore, half way between Malligam and Násik. मुत्तु in the Kalpa Sútra is the common word for मेघ, and मियुत्त is by a common rule derivable from मियुत्तु. The first word of the second line I suppose to be intended for मियुत्त, an adjective from मी. The names of the persons who caused this cave to be excavated may also be considered somewhat doubtful.

No. IV.

The four first lines of this inscription are in Sanscrit, and the rest in Prácrit, as well as the three following inscriptions. All have relation to the largesses of a son-in-law and daughter of one of the Satrap rulers-

- [1] सिद्धम् तं राज्ञः क्षत्रराजस्य क्षत्रपस्य नक्षपानस्य आमातृदीनीकपुत्रेण
उषवदानेन विभोद्धत सप्तसदेन मया भार्गसेया सुवर्णदानतीक्ष
करेण देवतेभ्यो ब्राह्मणेभ्यश्च षोडश ग्रामदेन अनुवर्षं ब्राह्मण ग्रतसा
श्वी भोजापयिषा
- [2] प्रभासे पुष्यतीर्थे ब्राह्मणेभ्यः आप (र्षा) द् भार्याप्रद (दे) न भवकहेद्व
पुटेभोवर्षने भोर्पारजेचतुब्राह्मणसप्तप्रतीत्यय प्रदेन आरामतडात्र
उदपानकरेण द्वापारादादमनतापीकरवेणदाहनुकानावापुष्य
नकरेण रतासाच नदीना उभतो (य) तीर (रे) सत (च)
- [3] प्रपाकरेण पीडित कावदे भोवर्षने सुवर्णमुखे भोर्पारजेच रामतीर्थेच रक
पर्षदभ्यः ग्रामेनामनेसे द्वचिग्रत्तु ब्राह्मदीनेर मूलसप्तप्रदेन भोवर्षने
चिरस्मिपु पर्यतेषु घर्मात्तना इदं क्षेत्रं कारितं इमाश्च षोडशो भटारका
स्त्रिंशच्च ततोस्त्रिंशच्चैरच मास्ये..... चिरञ्चं उतम भद्रं भोचयितुं
- [4] तेच मास्यया प्रभादेनेन अयथाता उतम भद्रकानश्च क्षत्रियोश्च सर्वैपरिग्रहा
कृता ततोस्त्रिंशतो षोडश (ष्क) रानि तत्र च मया अभिसेकौ कृतौ
चिनिश्च मासस्यानि दत्तानि यामोच ।
दत्तचनेन क्षेत्रं ब्रह्मण सवाराधिपुत्रस अन्नभूति सप्तसकोर्णताम क्षेत्रं का
द्यापण सप्तसेहि चतुषि ४००० यस्य पितु सप्तकनकरस माय उतरा
हरस्य दिसीय रत ममक्षेत्रे वसताम चितुदिस भिक्षुसप्तस मद्याहार
भविसत्.

Translation.

To the Perfect One. Peace. Ushavadáta, son of Dínika, and son-in-law of the Satrap (Viceroy) Nahapána under king Kshaharátra, bestowed in presents a thousand times three hundred cows, established for the presenting of gold a holy place on the river Bárnasoyá, gave sixteen villages to the gods and Bráhmans, and yearly feasted a hundred thousand Bráhmans. At the holy place Prabhása he was at the expense of the marriage of Bráhmans, according to the rite of the sages. At Bharukachha, Das'apura, Govardhan, and S'orpáraga he made square

buildings for houses of shelter ; he made gardens, tanks, and watering-places ; he placed charitable ferry-boats on the rivers Iba, Páradá, Damana, Tápí, Karvená, Dá, and Hanuká, and places for the charitable distribution of water on both sides of these rivers. At the round Kávada, Govardhana, Suvarn'-mukha, S'orpáraga, and Rámâtirtha, he gave to various companies in the village, for the assemblies of the poor, a capital of thirty-two thousand gold mohurs of Nándigera currency. It was this charitable person who, in the Govardhan of these mountains, which reflect the rays of the setting sun, caused this cave to be made, and these tanks to be excavated. At the command of his majesty I went to the disaffected province of Malaya, to deliver Hiradha, the excellent and fortunate [Governor]. The Malayans at the very sound of our trumpet took to flight. Having then recovered all the effects of the excellent fortunate Kshatriyas, I went my way, and came to Poshkara, where I performed the rite of Abhis'eka, and gave away three thousand cows and two villages.

This person, also, whose father was from the city of Sataka, and mother of the province of Uttarárha, bestowed a field on the Bráhma Ashribhúti, son of Váráhi, and gave a cave to the dejected, oppressed, and distressed, along with four thousand pieces of gold (4,000). In this my cave there shall be then a sin-removing abode for the Buddhist priesthood from the four quarters of the world.

Notes.

It is difficult for me at present to say whether the frequent omissions of the point for ष and other anomalies, belong to the original, or are the faults of the fac-simile, as I have not had an opportunity of comparing the two. The rather anomalous form of षोडशपञ्च with the ष inserted, I have ascertained to belong to the original, and this is probably the case with other unusual or incorrect forms. The word thousand, which frequently occurs, is probably sometimes to be taken, not literally, but figuratively for a great many. I have not been able to obtain anything satisfactory relative to the geography of several of the places mentioned in the text. The extract from the Mahabhárat in Wilson's Vishnu Purána gives a number of the rivers here mentioned. Barṇasoya is probably the Varṇasa or Parṇásás, which flows from the Pariyátra mountains. Prabhás is a well-known place of pilgrimage on the coast of Gujarát near Pattan Somnáth. Bharukachha may be Bhúj, the capital of Cutch, or some town in that province. The three next names occur before in No. I. S'úrpakarṇa, Ravan's sister, gives name to Násik, and Supa, here called S'orpáraga. If we judge from the sound,

Iba will be the Beyah or Vipás'á in the Punjáb, and Páradá the Párvati in Malva. Tápi is the Tapti near Surat. Rámatirtha may either be the place so named in the kingdom of Oude, or a place of that name on the Godáveri, close by Násik. On the remaining words not noticed in No. I. I can throw no light. Nándigera seems to have been the name of a town from which the currency was named; thus we have Surat, Chandore, and Furukabad rupees, &c. I suppose it refers either to Anandapura, so called by the Jains, and afterwards by the Hindús named Valabhi, the capital of the well-known sovereignty of that name on the North side of the Gulf of Cambay, or to Nandgám, the seat of a sovereignty in the Northern Concan, in an early century of our era. (See JI. B. B. R. A. S. p. 4—10.) The coinage in question was probably more valuable than others, as were our Sicca rupees, and was likely of what in the next inscription is called treasury gold. All this, however, is but conjecture: my inquiries have been unsuccessful in eliciting from natives any positive information on the subject. The Bhatáraka was probably his father-in-law, and the Kshatriyas the Nairs against whom the aboriginal Malabarians had revolted; thus making the Parthian empire extend to Cape Comorin. With the fifth line the Prácrit begins; the concluding part was probably written afterwards by a Buddhist, while the first part is the production of a Bráhman.

No. V.

This inscription immediately follows the preceding, and enlarges on the donations to the Buddhist priesthood. It, and all the remaining ones on this cave, are in Prácrit.

- [1] उष्वदातेन सप्तस चानु द्विसस हस लेग नियातिन दत्तचनेन अक्षुष
निमि काहापण सप्तसरा
- [2] रतेच काहापणा प्रयुत नावर्धेन वायवासु श्रेणिसु को ली (पी) क निकाये
१०,००,००० पडिक इत अपर कोषो क [णि] क
- [3] रतो मनलेगे वसहयान भिसुन विसिय रककस चिवरिक बारस क
सप्तस प्रयुत पायुन पडिके इते अतो ६ सग
- [4] खावित नेमस सभाय निवधच फलकवारो चरिवेति उयनेन दत्त वस १
कातिक झुधेपनरस पुबाक वसे १ र
- [5] पनरस १५ रत भवता देवा ३,००,००० कुणानच कहापण सप्तसणि
सतनि ५०,००० पचविमक सुवण कतादिन सुवण सप्तसणमूख

Translation.

- [1] Ushvadáta constructed this cave for the Buddhist priesthood from the four quarters of the world, and he bestowed upon it as a permanent capital a thousand gold mohurs (kahápan).

- [2] He gave also a million gold mohurs to the hands of those dwellers on Govardhan who have abandoned the world, of treasury gold, 1,000,000, worth each a hundred groats, and of the purest gold.
- [3] In this my cave there is a property for the mendicant priesthood, who have abandoned the world, to be distributed among the individual Buddhist priests, the stock being a thousand millions : each on the great annual festival to receive a hundred groats, (properly 30 shillings, or one gold mohur,) and ordinarily six. (1s. 8d.)
- [4] The well instructed assembly of Buddhist Bráhmans consecrated this treasure on a lucky day in the 1st year of the donor, on the bright fortnight of the month Kártik.
- [5] There was also given over to Bhagaván and the gods on the 15th day of the —— in the 1st year, of gold húnas three hundred and fifty thousands (350,000,) worth a hundred thousand gold mohurs.

Notes.

Few new words occur in this inscription. वायुन for वार्षण is the annual oblation to the manes of one's ancestors, observed over all the heathen world. In line 4th the meaning of उचनेन is doubtful.

Húnas, probably originally introduced by the Huns, and worth about the third of a gold mohur now as they were then, are here introduced. This coin is now chiefly current to the South in the Madras districts, which would seem to show that the Indo-Scythian rule extended even to those regions, and that the expedition mentioned in No. IV. was to secure a permanent conquest. The Padika, taking the gold mohur at Rs. 15, or £ 1 10s., will amount to 3½d., or 2½ annas, ¾d. less than a groat. It is worthy of remark that we have here the rudiments of the decimal system for small coins, a system now entirely lost among the Hindús.

No. VI.

The first two lines of this inscription relate to the Satrap's daughter, the wife of the abovementioned Commander of the Forces ; the rest to the General himself. Properly there are two inscriptions here.

- (१) विष राज्ञ क्षत्रातस क्षत्रस नक्षपानस दुषि
 (२) नु दीनोक पुत्रस उपावदानस कुटुबिनीस दक्षमिवाय देव वन उचनेनो
 (३) विष वसे १ वेसास मासे राज्ञ क्षत्रातस क्षत्रस नक्षपानस आमातरा
 दीनोक पुत्रेन

- (४) दत्तानि १,००० सचस चातु दिसस ये इम दिम छेने वप्रातनमवचनि
चिवरक १ व्रण मूलच
(५) ये १०,००,००० पायुन पठिके इत रनेच कषापणा अपठि दात
वा १,००० भोजा एत चिवरिक सचचानि व १०,००० पठिके सने
(६] मस कपुरा वारेच जामे चिचल पदे दत्तानि नादिजेरानमुळे सचचनि
अच ८,००० एत च सर्वे फलक वारे चरिचानि

Translation.

- [1 and 2] To the Perfect One. The religious assignation of landed property by the lady Dakshamitra, wife of Ushavadāta, son of Dīnka, and daughter of the Satrap Nahapāna, Viceroy of King Kshaharātra.
- [3 and 4] To the Perfect One. In the year 1 (?), in the month Vaisākh, there were gifted as follows by the son of Dīnka, son-in-law of the Viceroy Nahapāna, of King Kshaharātra, to the thousands of the priesthood who come from the four quarters of the world, this religious cave, to be a residence during the rainy and cloudy months ; and to each Buddhist mendicant six groats, and on the great festival a hundred, from the capital sum of a million (1,000,000).
- [5 and 6] A thousand Kahāpans (gold mohurs) are here deposited, which are not to be expended ; and for food, and to be expended on mendicants, two thousand, (2,000), in sums of a hundred groats ; to be expended on camphor, incense, garlands, the village, and granary, eight thousand, (8,000), in value of the currency of Nāndigera. The bestowal of all these was celebrated by a solemn religious ceremony, on a lucky day.

Notes.

The word **ववरको** is peculiar, and I am doubtful of its interpretation. **दिम** is a strange word : if it is not a corruption of **चर्म**, I do not know what it is. The 6th line seems to refer to expenses for worship, and other incidental items of expenditure. There are difficulties also in the numbers and general sense in line 5th. The **व** is Gujarāthi even now for 2, and the figure like the ancient **च** I suppose to be the cypher for the same. The sense of **फलक** is here peculiar, but no other suits.

No. VII.

This is nothing more than a repetition of the two first lines of the foregoing, on another part of the cave, and the reader is therefore referred thither for its contents. The last letters of the 1st and 3rd lines, however, are incorrect, as will appear by comparing this with the other inscriptions.

This is the last of the Satrap inscriptions, the letters of which agree not only remarkably with one another, but also with those of the Girnar Inscription translated by Mr. Prinsep, and those of the legends of the Satrap coins.

No. VIII.

This inscription is on one of the intermediate small caves.

वेदित पुत्रस नेकसस रमणक
साकलि पक्रियस ज्ञेण [दे] स घम [चतु] दि
सस मिक्षु सघस निघातसं दत व
नेम अक्षस निवी काद्यापण सेत दे
सघस सुघ रतो वसवघस पवदतस चव
.... क दातव वारदक

Translation.

The religious assignation of a cave by Ramanāka, bearer of the royal standard, son of Velidata, skilled in sacred learning. It has been made over by him to the mendicant priesthood, and he has also added to the inexhaustible capital stock, and given a hundred gold mohurs to supply the wants of the priesthood. Here is [the assembly] of holy men, who keep the session of the rainy season, and who bring a blessing on [Ramana]ka, the donor.

Notes.

The word नेजस is here converted into नेकस. The translation of the last line, on account of its broken state, is only conjectural. The figure like दे at the end of line 4th I suspect to be a numeral for 100.

No. IX.

This inscription is on a small cave still further on.

सिध उतरावस दनामितियकस योजकस घम देवपुत्रस इन्द्राग्निदतस घमनुज
इमं ज्ञेण पवताति रण्णन्दि ज्ञानितं अमंतरं च ज्ञेणस चेतिस घरो पौडियोच मतापि
तर उदिस इमं ज्ञेण कारितं सव बुध प्रजाय चतु दिगस मिक्षु सघस निवतित स
वपुनेम घम रचितेन

Translation.

To the Perfect One. This cave was excavated for religious persons in the wilderness, at the extremity of the mountains, by Indrágnidatta, son of Dharmadeva, prince regnant under Datamitraka, of the Northern region. Inside the cave is a dágoba, and there are cisterns also. This cave was made from respect to my father and mother, and gifted to all the followers of Buddha, the mendicant priesthood from the four quarters of the world, along with every one who is purified and preserved by religion.

Notes.

उत्तराक्ष is probably उत्तराक्ष. Near the end निवृत्तित्त is supposed to be equivalent to निवृत्तित्त, in the sense given. The truly Vedic names of this inscription point to a convert from Bráhmanism as the person who excavated this cave. Probably he was adopted by Datamitraka, a provincial raja, and by him made Yuvarája, in which sense I understand Yonaka. If योगक्ष is for यवन, the difficulty will be got over in the same way, namely by adoption ; as we have no reason to believe that the modern restrictions were attended to in these ancient times. Dhenukakatá, whom we are told was a Greek in one Kárlén inscription, had a Hindú Rishabhadatta, as mentioned in another, who stood to him in the relation of father.

No. X.

This inscription seems to have been executed at the command of some local prince.

महत्पात्रिकाय सोमवस अत्रियतगकस मदाकारक
राया मन्त्रिरसु लक्ष सवत्सि सि लने कण्ठ दुदुतस महापकवी

His son-in-law, Mahárhakasi, excavated this all-desirable habitable cave in the Mancha Hills, in honor of King Bhadrákáraka, the retainer of warriors, whose hair stands on end with delight, and who is ever foremost in the conflict.

Notes.

This inscription may be imperfect, but of this I am not certain. सवत्सि I render by सवत्सिप्सा.

No. XI.

This inscription is of the same general character as the last.

यसमा राय कपणक मातुम चेतिसधर पविते
ति रज्जमनि वपापित

Translation.

The renowned King Kapanaka established this Buddhist temple, for the benefit of his mother, in the wilderness near the extremity of the mountains.

Notes.

I have considered पवनेति the same as the पवताति of No. IX., and as equivalent to the पर्वताति, which in Maráthi would be written पर्वताति. If this be objected to, the word should be rendered consecrated.

No. XII.

This is over the cave of the wife of the Commander in Chief of the Emperor Yadnya S'ri, so often before mentioned—the last cave in the series.

- [1] सिध राज्ञो मोतमी गुतस चानसिरी यच्च सातकणीस सबदरे सातम जह
मत्तम पच्छे ततिय २
- [2] दिवसे पठमे केसिकस मत्ता सेणापतिस भुवजोप सामरि जाय मत्तासेणप
तिय अय जेण
- [3] बोपकि यति सजमने सेपथ चेषितकमने वपुकानी वकिसाणि उकुते लय
वेसण नीतो चतुदिसस चमिद्धुसवेस आवने दातति

Translation.

To the Perfect One. This Commander in Chief's cave (excavated by order) of Bhavagopa Sámbari, wife of Kes'i, Commander in Chief of the Emperor S'ri Yadnya Sât Karni, descendant of king Gotamiputra, in the seventh year, during the third (3rd) demi-lunation of winter, on the first day. By Bopaki Yati, Sajamuni, Sepayá, and Sital Munís, Bahukáni, Vakisani ;—by all of the aforesaid, admission to this comfortable abode is granted to the mendicant priesthood from the four quarters of the world.

Notes.

The proper names of the persons mentioned in the 3rd line of the inscription are attended with difficulties. I have divided the words in the best way I could. These persons seem to have been of a kind of Pancháyat, or Committee, to whom the affairs of the cave were intrusted. The original fac-simile gives मने and not मुने, and the change is made only on conjecture. The word दातति I understand to be a passive, notwithstanding that the termination seems opposed to this.

No. XIII.

This concluding inscription is in the same cave, and in Sanscrit.

देव चर्को उपासि
जाय मत्ताया लयन

INSCRIPTIONS
FROM CAVES IN THE ISLAND OF SALSETTE
REDUCED FROM IMPRESSIONS TAKEN BY
LIEUTENANT P.F. BRETT.

No. 1.

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ॡ ॣ

No. 2.

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No. 3.

ॡ ॣ
ॣ ॣ

No. 5.

ॣ ॣ

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20111

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ሆኖ በሚኒስቴር ደረጃ ላይ ለሚሰሩ
የሀገር ጤና አገልግሎት ለሚሰጡ
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No15

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No16

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No17

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No18

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INSCRIPTIONS
FROM CAVES NEAR NASIK REDUCED FROM IMPRESSIONS TAKEN BY
LIEUT P. F. BRETT.

No. 1

(1) ॐ । भूदुःखो यन्मम ॥ ५ ॥ ५ ॥ ५ ॥ ५ ॥
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(3) ΣC_{ij} $\leq \sum_{i=1}^n \sum_{j=1}^n C_{ij}$ $\Delta \Gamma E$ \leq $\sum_{i=1}^n \sum_{j=1}^n C_{ij}$ $\Delta \Gamma E$ \leq $\sum_{i=1}^n \sum_{j=1}^n C_{ij}$
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ሰባት ወር ለሚከተለው ሰዓት ለሚደረግ ስልጠናው ላይ ለማገዛት
የሚያስፈልጉትን ሰነድ ይጻፉ

(*) የሥራ ስልጠናውን ለማጠናቀቅ የሚያስፈልጉትን ሰነድ
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(*) ተጨማሪ ስልጠናዎችን ለማጠናቀቅ ለሚያስፈልጉት ሰነድ
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3) ማንኛውም ሰው ለሌላ ሰው ለሚሰጠው ገንዘብ ለማግኘት ማድረግ ወይም ለሌላ ሰው ለሚሰጠው ገንዘብ ለማግኘት ማድረግ ወይም ለሌላ ሰው ለሚሰጠው ገንዘብ ለማግኘት ማድረግ

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11) ለሌላ ሰው ለሚሰጠው ገንዘብ ለማግኘት ማድረግ ወይም ለሌላ ሰው ለሚሰጠው ገንዘብ ለማግኘት ማድረግ ወይም ለሌላ ሰው ለሚሰጠው ገንዘብ ለማግኘት ማድረግ

- (7.) ገብረአብ ሃሊህ ስዕብጊ ጸ ጊሄ ሠዕ ደገሃጥህ ገጽአሠ
 ልዕጊ ጥልቀት/ዕጥ ስጽቻ ዘገባህ ል ልዕጊ
- (8.) ስልጠናው ደህን ስህተት ስህተት ስህተት ስህተት ስህተት
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- (9.) ልብ ልብ ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት
 ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት
- (10) ገብረአብ ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት
 ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት
- (11) ልብ ልብ ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት
 ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት
- (12) ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት
 ስህተት ስህተት ስህተት ስህተት ስህተት ስህተት

IV.

- (²) ሃላጊዎች ለሰው ጤና ለሚያደርጉ ሁሉም ጉዳዮች ላይ ጥንቃቄ ይኖራቸዋል። ለሰው ጤና ለሚያደርጉ ሁሉም ጉዳዮች ላይ ጥንቃቄ ይኖራቸዋል። ለሰው ጤና ለሚያደርጉ ሁሉም ጉዳዮች ላይ ጥንቃቄ ይኖራቸዋል።
- (³) ሃላጊዎች ለሰው ጤና ለሚያደርጉ ሁሉም ጉዳዮች ላይ ጥንቃቄ ይኖራቸዋል። ለሰው ጤና ለሚያደርጉ ሁሉም ጉዳዮች ላይ ጥንቃቄ ይኖራቸዋል። ለሰው ጤና ለሚያደርጉ ሁሉም ጉዳዮች ላይ ጥንቃቄ ይኖራቸዋል።

(*) 398 ህወሃዲ ላይ ይገኛል፡፡ IV.
 ሆኖ ገንዘብ ለሰጠው ሰው ይሰጣል፡፡
 ሆኖ ገንዘብ ለሰጠው ሰው ይሰጣል፡፡

የሰጠው ሰው ለሰጠው ሰው ይሰጣል፡፡
 ሆኖ ገንዘብ ለሰጠው ሰው ይሰጣል፡፡

(*) ለሰጠው ሰው ለሰጠው ሰው ይሰጣል፡፡

(*) ሆኖ ገንዘብ ለሰጠው ሰው ይሰጣል፡፡ V.
 ሆኖ ገንዘብ ለሰጠው ሰው ይሰጣል፡፡

(*) ሆኖ ገንዘብ ለሰጠው ሰው ይሰጣል፡፡
 ሆኖ ገንዘብ ለሰጠው ሰው ይሰጣል፡፡

VIII.

- (1) ደህን (አዛላ ለሥነ ጥናት ለሥነ ጥናት)
- (2) ደብዳቤ ለሥነ ጥናት ለሥነ ጥናት
- (3) ለሥነ ጥናት ለሥነ ጥናት ለሥነ ጥናት
- (4) ለሥነ ጥናት ለሥነ ጥናት ለሥነ ጥናት
- (5) ለሥነ ጥናት ለሥነ ጥናት ለሥነ ጥናት
- (6) ለሥነ ጥናት ለሥነ ጥናት ለሥነ ጥናት

IX.

- (1) ደብዳቤ ለሥነ ጥናት ለሥነ ጥናት ለሥነ ጥናት
- (2) ለሥነ ጥናት ለሥነ ጥናት ለሥነ ጥናት
- (3) ለሥነ ጥናት ለሥነ ጥናት ለሥነ ጥናት
- (4) ለሥነ ጥናት ለሥነ ጥናት ለሥነ ጥናት

X.

(1) ስርዓተ ጥቅም ስርዓተ ጥቅም ስርዓተ ጥቅም
 ስርዓተ ጥቅም

(2) ስርዓተ ጥቅም ስርዓተ ጥቅም ስርዓተ ጥቅም
 ስርዓተ ጥቅም

XI.

(1) ስርዓተ ጥቅም ስርዓተ ጥቅም ስርዓተ ጥቅም
 ስርዓተ ጥቅም

(2) ስርዓተ ጥቅም ስርዓተ ጥቅም ስርዓተ ጥቅም
 ስርዓተ ጥቅም

XII.

- (1) $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$
 - $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$
- (2) $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$
 - $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$
- (3) $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$
 - $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$
- (4) $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$

XIII.

- (1) $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$
- (2) $\frac{1}{x^2} + \frac{1}{x^3} + \frac{1}{x^4} + \dots$

Appendix from Dr Bird's Caves of Western India.

ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥
 ॐ नमो भगवते वासुदेवाय ॥ श्रीगणेशाय नमः ॥ ॐ नमो भगवते वासुदेवाय ॥

Inscription on the large plate of Copper found in the Tappe at Kanary, which was opened by James Bird Esq^r

Table of letters and Syllables as exhibited in the Cave inscriptions.

Sabrap Chandas letters.	Other Syllable letters.	Other letters.
a	𑀅	𑀅
a'	𑀆	𑀆
i	𑀇	𑀇
i'	𑀈	𑀈
u	𑀉	𑀉
u'	𑀊	𑀊
e	𑀋	𑀋
am	𑀌	𑀌
ah	𑀍	𑀍
ka	𑀎	𑀎
kha	𑀏	𑀏
ga	𑀐	𑀐
gha	𑀑	𑀑
ch	𑀒	𑀒
chha	𑀓	𑀓
ja	𑀔	𑀔
gha	𑀕	𑀕
nyordhy	𑀖	𑀖
i	𑀗	𑀗
ih	𑀘	𑀘
d	𑀙	𑀙
dh	𑀚	𑀚
n	𑀛	𑀛
l	𑀜	𑀜
dh	𑀝	𑀝
n	𑀞	𑀞
ph	𑀟	𑀟
h	𑀠	𑀠
bh	𑀡	𑀡
m	𑀢	𑀢
y	𑀣	𑀣
r	𑀤	𑀤
l	𑀥	𑀥
v	𑀦	𑀦
sh	𑀧	𑀧
s	𑀨	𑀨
r	𑀩	𑀩

ka ka' ku ku' ke ke' ko ko' ka ka'

𑀅 𑀆 𑀇 𑀈 𑀉 𑀊 𑀋 𑀌 𑀍 𑀎 𑀏 𑀐 𑀑 𑀒 𑀓 𑀔 𑀕 𑀖

ka sha 𑀅 𑀆 𑀇 𑀈 𑀉 𑀊 𑀋 𑀌 𑀍 𑀎 𑀏 𑀐 𑀑 𑀒 𑀓 𑀔 𑀕 𑀖 𑀗 𑀘 𑀙 𑀚 𑀛 𑀜 𑀝 𑀞 𑀟 𑀠 𑀡 𑀢 𑀣 𑀤 𑀥 𑀦 𑀧 𑀨 𑀩 𑀪 𑀫 𑀬 𑀭 𑀮 𑀯 𑀰 𑀱 𑀲 𑀳 𑀴 𑀵 𑀶 𑀷 𑀸 𑀹 𑀺 𑀻 𑀼 𑀽 𑀾 𑀿 𑀿

𑀅 𑀆 𑀇 𑀈 𑀉 𑀊 𑀋 𑀌 𑀍 𑀎 𑀏 𑀐 𑀑 𑀒 𑀓 𑀔 𑀕 𑀖 𑀗 𑀘 𑀙 𑀚 𑀛 𑀜 𑀝 𑀞 𑀟 𑀠 𑀡 𑀢 𑀣 𑀤 𑀥 𑀦 𑀧 𑀨 𑀩 𑀪 𑀫 𑀬 𑀭 𑀮 𑀯 𑀰 𑀱 𑀲 𑀳 𑀴 𑀵 𑀶 𑀷 𑀸 𑀹 𑀺 𑀻 𑀼 𑀽 𑀾 𑀿

𑀅 𑀆 𑀇 𑀈 𑀉 𑀊 𑀋 𑀌 𑀍 𑀎 𑀏 𑀐 𑀑 𑀒 𑀓 𑀔 𑀕 𑀖 𑀗 𑀘 𑀙 𑀚 𑀛 𑀜 𑀝 𑀞 𑀟 𑀠 𑀡 𑀢 𑀣 𑀤 𑀥 𑀦 𑀧 𑀨 𑀩 𑀪 𑀫 𑀬 𑀭 𑀮 𑀯 𑀰 𑀱 𑀲 𑀳 𑀴 𑀵 𑀶 𑀷 𑀸 𑀹 𑀺 𑀻 𑀼 𑀽 𑀾 𑀿

Table of Numbers

	Fractional Number	Old Indian Numerals	Satrap Numerals	Brahmi Syllabic Numerals ascribed to the Satraps		Indian Names of Numerals
1	—		4?	𑀓	ka	ek
2	≡					
3	≡	𑀓	4	𑀓	ti	tin
4		𑀓 𑀓 𑀓	𑀓 𑀓	𑀓	cha	char
5	†	𑀓	†?			
6		𑀓?	±			
7		𑀓				
8			𑀓	𑀓	lla	oth
9		3				
10		∞, ∞	𑀓, 𑀓	𑀓	ja or dsha	dash
20		0, 0				
30		𑀓				
100		𑀓, 𑀓	Δ, Δ	...		
1000			𑀓	𑀓	psa	sahasr

Translation.

A religious assignation of a place for devotional meditation.

Notes.

The last word here आस्यनं, or स्यनं, is probably the original whence स्यनं, the common name of such caves, is derived.

In conclusion, some apology may be expected from me for undertaking these translations, now that copies of fac-similes are placed within reach of the learned world. I have only, then, to say, that ever since I came to India, an uncontrollable desire to examine such original documents as form the foundation of the history and institutions of the country has influenced me; and, possessing some local advantages for the study of these inscriptions, I have ventured to lay the fruit of my leisure hours before the Society. How far after previous failures, in a greater or less degree, I have in this attempt succeeded, must be left to the judgment of others; but I shall at least have directed the attention of Oriental scholars to the important historical bearing of some of the inscriptions on our caves, and may thus induce some learned Orientalist to give us a perfect version of them. The great leading facts relative to the Satraps of the Indo-Parthian Empire, the A'ndhra Emperors, and Balabhi sovereigns, are too prominently brought forward to admit, I apprehend, of hesitancy or doubt, and when the ancient history of India is written, will occupy in it a place suitable to their importance.

I look forward to a future opportunity of laying before the Society similar translations of the inscriptions found at Kárla and Junír, and I trust also to be able to compare all the published copies of the fac-similes with the inscriptions themselves, which, in respect of those at Násik, I have been unable as yet to do, so as at last to get as perfect a copy of them as can be obtained in the present state of the rocks. As the fac-similes are the property of Government, and executed by another gentleman, I have done nothing more than to the best of my ability see that the lithographer executed his task faithfully. I have not even in my own Devanágari transcript corrected what I conceive to be errors, except in a few glaring instances, reserving that for the translation and the notes, in the latter of which I have generally limited myself to what was necessary to fix and show how I understood my text, not attempting to explain what Oriental scholars know better than I can teach them.

ART. III.—*Geology of the Nagpur State.* By the Rev. S. HISLOP.

Presented March 1853.

THE country around Nagpur has received more than an average share of attention from geologists ; and when among these I mention the name of Dr. Voysey, it may appear presumptuous to propose, as I now do, to travel over the same ground. My object, however, in the following paper, is not so much to describe the physical features of the district, as to enumerate the organic remains which within the last two years have been found in it. The first of these fossils forced themselves on my attention in June 1851, when walking in company with my friend and colleague the Rev. R. Hunter, in the immediate neighbourhood of our residence. Had it not been for this unlooked for occurrence, and the opportunities we have since enjoyed at seasons of relaxation, and on our missionary tours, of becoming acquainted with similar relics in other localities ; and, I may add, had it not been for the contributions of military friends, who kindly placed their valuable gleanings in the same field at our disposal, the notes here presented would not have been penned.

At the period when our first discovery was made, the state of knowledge in regard to the palæontology of the Nagpur territory I believe to have been this :—Mr. Malcolmson, in the progress of his investigations into the fossils of the Eastern portion of the great basaltic district of India, had in 1833 traced a freshwater deposit at various intervals through the north of the Nizam's kingdom into the southern part of the Nagpur Raja's dominions, though he does not seem to have suspected its existence in the immediate vicinity of the capital.* Again Lieutenant Munro some years after met with the impressions of pieces of fern in the sandstone near Kámpti, which were figured and described in the Journal of the Bombay Branch of the Royal Asiatic Society.† The result of this examination of the freshwater and sandstone formations within the Nagpur state was that Chikni, about

* Transactions of the Geological Society, vol. v. 2nd series.

† No. v. April 1843.

60 miles south of Nagpur city, was given as a locality for the *Unio Deccanensis*, *Physa Prinsepii*, *Paludina Deccanensis* and *Melania quadri-lineata*; and Hinganghát, 16 miles nearer the capital, was said to abound in silicified wood; while the fragments of fern discovered near Kámpti were supposed to approach nearest to the *Glossopteris Danaoides* of Royle. From the imperfectness of the latter specimens, as figured in the journal, it is difficult to ascertain the exact character of the fossil found by Lieutenant Munro; but, judging from fossils of the same locality that I have examined, I would hazard the conjecture that the generic name must have been rightly given, though not the specific, as the plant called *Glossopteris Danaoides* by Royle is now admitted to be a *Tæniopteris*.

Our first discovery of a fossil within the territory of Nagpur was of a *Physa*, in the freshwater deposit enclosed in a trap hill about a mile west of Sitábaldi or the Residency, and two miles in the same direction from the native city. In a few days after, at the same spot, we met with the first bones and teeth, and after a week or two we brought to light on Tákli plain, about $2\frac{1}{2}$ miles N.W. of Nagpur, the first-fruit, an entomostrakon. About the same time, from observing the traces of ancient vegetation on the soft clayey sandstone used for whitening the sand-boards in our schools, we were led to the discovery of *Glossopteris* and *Phyllothea*, and some seeds or seed-vessels, at Bhokára, six miles north of Nagpur. Shortly after, Mr. Hunter collected the first specimen of coleoptera, and being now joined by Captain Wapshare, Acting Judge Advocate of the Nagpur Subsidiary Force, many rare and interesting fruits were speedily added by his zealous and valued efforts; while Lieutenant Sankey, of the Madras Engineers, with whom I visited Silewádá, about 12 miles north of Nagpur, which has yielded a great variety of the most beautiful specimens of *Glossopteris*, had the merit of finding in the Kámpti quarries, 9 miles N.E. of Nagpur, the first *Vertebraria*, along with two fine species of *Phyllothea*, and a profusion of a kind of seed. At Korhádi, 7 miles north of Nagpur, Mr. Hunter and myself discovered, in the red shale that underlies the sandstone, tracks of worms, to which have been added more recently foot-marks, and the impression of what is probably a *Phyllothea*; and in a mission tour to the west, undertaken the first cold season after the commencement of our palæontological relaxations, we met with an abundance of fish-scales in the freshwater formation at Pahadsingha, 40 miles W.N.W. of Nagpur. Some time after our return we received an accession to our collection of shells from Dr. J. Miller, then of the 10th Regt. M. N. I., who had found the same freshwater formation at Machhahodá, 100

miles north of Nagpur, and also from Mr. Sankey, who had fallen in with it at Pilkápábád, 25 miles to the N.W. The same gentleman, along with Dr. Jerdon, subsequently visited Machhaghodá, whence, in addition to the coal fossils of that district, which they were the first to bring to notice, they returned laden with many well-preserved shells and specimens of wood similar to what occur in the neighbourhood of Nagpur, along with fragments of the freshwater rock, in which was detected a peculiar form of entomotricon. During the first twelve months of observation, while directing attention especially to the organisms of the sandstone and freshwater formations, we could not fail to observe occasionally the more recent remains of quadrupeds and shells that were presented to us in comparatively modern deposits. Last year, while out on our annual tour in a S.E. direction from Nagpur, besides the discovery of an extensive iron district, surrounded by a country abounding in laterite, we increased our list of fossils by adding some coniferous remains and bivalves from the sandstone.

Having made these remarks by way of a historical introduction, I may now briefly glance at the superficial extent and superposition of the rocks in which the fossils occur. Our principal observations have been made within an area which, having the city of Nagpur for its S.E. corner, is spread over a square with a side of 10 miles. At the same time we have had facilities, either personally or by the aid of friends, of becoming more or less acquainted with the country in a straight line from Nagpur towards the four cardinal points to the distance of 80 miles or upwards. This distance nearly carries us to the limits of the Nagpur kingdom on all sides but the east, in which direction the frontier is much further removed from the capital. If we conceive a circle drawn around Nagpur with a radius of 80 miles, and the surface of that circle divided into four parts by means of lines passing through the city due north and south, and east and west, then the quadrant between the south and west would be occupied exclusively by black soil and trap rocks; that between west and north would be chiefly occupied by the same, though towards the centre of the circle diversified by patches of sandstone, with a sandy loam on its surface; while the remaining two would be characterised for the first 30 or 40 miles by igneous stratified and massive rocks, which in several places protrude from under a deep soil, for the most part black, but in some instances red, beyond which lie occasional tracts of sandstone in the lower districts, and metamorphic strata in the more elevated regions, both very frequently covered by a red soil and laterite.

In taking a combined view of the rocks which occur within the circle just described, the following seems to be the descending order in which they succeed each other:—I. Recent formations, consisting of black or red soil, both being mixed with kunkur, and the latter frequently containing strata of sand and gravel, with the remains of shells and quadrupeds, little if at all distinguishable from existing species; II. Laterite; III. Overlying trap with nodules; IV. Fresh-water deposit; V. Vesicular trap, that has been in many cases injected into the preceding, and is obviously of an origin subsequent to the overlying trap; VI. Sandstone formation, consisting of *1st*, upper beds, that are sometimes soft and friable, and of a white and red colour, or that are hard and gritty, and pervaded by iron bands; *2nd*, middle strata, of a fine fissile structure, and gradually becoming coarse as they approach the *3rd*, inferior beds, which much resemble the upper ones, except that they contain no iron; under which (*4th*) occur green and red shales; VII. Limestone formation, which within our area is crystalline, and mixed with magnesia; and VIII. metamorphic and granitic rocks.

I. *Recent Formations*.—*1st*. Black soil, or Regur (in Maráthi *Kanhára*) has yielded no organic remains to our imperfect researches, but I feel persuaded that those who are well supplied with apparatus will yet have the pleasure of detecting some microscopic animals in it. I have never been able to acquiesce in the now generally received theory that accounts for it by deposition in water. It seems far more probable that it is the product of luxuriant vegetation in a moist atmosphere, which has grown and decayed in the localities where it is found. This supposition would harmonise with all the appearances of stratification which it undoubtedly exhibits, and, at the same time, preserve its similarity to the *Tchornoizem* of Russia, which has lately been shown by Ehrenberg to contain several forms of *Polygastrica* and *Phytolitharia*. In the kunkur, which is mixed with the lower portion of the regur, bones are occasionally found; but though they look ancient enough from the thick coating of lime with which they are encrusted, they do not appear to differ from the bones of the modern ox and sheep. Besides, I have never found such remains so far from the abode of men as to free me from the suspicion that they belonged to animals in a domestic state.

2nd. The red soil, which generally takes the place of the regur in sandstone and metamorphic districts, is sometimes seen on the banks of rivers to be of great depth. It alternates not unfrequently with layers of loose sand and gravel, which contain existing fluviatile shells

of the genera *Unio*, *Cyrena*, and *Melania*. These shells have undergone no change since they were alive, save that they have been subjected to attrition, and bleaching by water and the atmosphere. In the district west of Nagpur, the rivers often expose a bed of sand and gravel cemented by a small quantity of lime, and in its hardened state furnishing blocks two or three feet thick of sandstone or conglomerate, as the case may be. In this stratum near the Kolár river, about 10 miles north of Nagpur, there occurs an abundance of *Paludina*, *Melania*, and *Cyrena*. These, unlike the fluviatile shells before mentioned, have undergone a decided change. In some instances their cavities are filled with the siliceous and calcareous matter of the matrix, but in most cases the shell has completely disappeared, leaving only the internal cast. On the banks of the Sarpan river, near Tondakheiri, 14 miles N.W. of Nagpur, there is an accumulation of shells mingled with bones. The shells are partly of a fluviatile character, including *Unio* and *Cyrena*, but on the other hand they present a numerical preponderance of such as are generally found in lacustrine situations, such as *Bithenia*, *Limnæa*, and *Planorbis*. They were slightly petrified. The bones found in connection with these shells consisted of jaws, vertebræ, and other parts of mammalia; but I regret to say they were accidentally destroyed before they could be examined. Rising to the surface of a thin kunkuraceous gritty deposit in the plain of Tákli, were observed the remains of a large animal, the bones of which were completely petrified, but after petrification, had been so much affected by the weather as to fall to pieces on being removed. These are all the bones that have been found near the surface, unless we here include part of a femur 2 inches, and a phalanx one inch broad, discovered at Junyápání Chouki, 5 miles west of Nagpur. I am, however, inclined to suppose that they had been washed out of the freshwater deposit enclosed in trap.

II. *Laterite* (in Maráthi *Murmádi*).—This formation spreads over a large area to the east of Nagpur. It is now known to stretch with several intervals from Pawani to Chándá, a distance north and south of at least 60 miles. It is also seen at Máhonda, on the Khanari river, which is to the north of Pawani, and how far it extends north of this has not yet been ascertained; but I believe it is found more or less up the Wein Gangá till near its source, and joins on with the large development of the same rock that can be traced in the Jabalpur district. Its breadth from east to west has not been determined. When such a large area is assigned to this rock, it is not meant that there is a great thickness of it observed everywhere on the surface. In some places it is found of a thickness of 5 feet, and in others it is

known only by a few pebble-shaped nodules washed out of the soil. But in many localities the blocks of laterite are visible only on the rising ground, which is covered with jungle, while in the cultivated hollows they disappear under a surface soil of red sandy clay. That they are there, however, can be ascertained by inspecting the banks of rivers in laterite districts, where the brown porous rock may be detected at a depth of 30 feet from the general level of the plain. Laterite is seen to overlie all sorts of rocks. It is equally present above sandstone and gneiss. The theory, therefore, which supposes it to be the product of the latter rock decomposed, is altogether without foundation. To point out a better mode of accounting for it is not so easy. But in a late tour through a metamorphic district abounding in iron ore, which was also characterized by the extent of its lateritic formation, the idea occurred to me that the two might possibly be connected with each other as cause and effect—that, in short, the ferruginous matter coming up from among the metalliferous strata might, by the agency of water, have impregnated every decaying rock on the surface, which, with the subsequent infiltration of rain, would then present the appearance of laterite, as we now find it. In the rocks of this formation east of Nagpur no fossils have as yet been discovered; but diamond mines have been opened in them. I perceive that Mr. Malcolmson inferred the identity of the sandstone of Central with that of Southern India, commonly called the diamond sandstone, from the existence of diamonds at Weirázad, a town about 80 miles S.E. of Nagpur.* On recently visiting that locality, Mr. Hunter and I found that there was no sandstone whatever in the neighbourhood, and that the gems had been extracted from a lateritic grit overlying quartzose rock. I am not sufficiently conversant with diamond districts to make any universal assertion on the matter; but I would suggest it as a subject worthy of inquiry, whether the condition favorable for the discovery of diamonds is the presence, not of any subjacent rock, either metamorphic or sedimentary, but of ferruginous clay in the grit or conglomerate which constitutes the diamond matrix. This is the impression left on my mind by what I have read of the diamond mines at Ovalampalli and Kondápetta, near Cuddapa, and the diamond washings in the Mahánadi, near Sambalpur.

III. IV. and V.—I shall not here enlarge on the overlying and underlying trap, which, as they present objects interesting chiefly to the mineralogist, do not come within the scope of this paper.

* This Journal, No. v. 1843.

But before proceeding to the consideration of the fossiliferous fresh-water formation that lies between them, I may be permitted to refer to some supposed petrified fruits that are picked up at *Gidad*, about 40 miles south of Nagpur. On the top of a trap hill near this place is a tomb, said to be that of Shek Jarid, whose fame is spread far and wide among the Musalmáns of India. Newbold tells us that for twelve years he is asserted to have inhabited a cave at Kadri, near Mángalur, after which he disappeared, and was never more heard of. Perhaps he came to Central India; for if we are to believe tradition, his mortal remains lie buried at *Gidad*, and attract crowds of pilgrims, both Hindús and Musalmáns. But unhappily for the credit of the marvels associated with his name, it is maintained by these followers of the Prophet from the north-west, that the Fakir lived and died among them, and that his tomb still exists in that part of the country. Among the wonderful stories related of him, while he is said to have dwelt at *Gidad*, it is reported that one day a Banyan passed his resting place with bullocks laden with nutmegs, betelnuts, and other such commodities. The Fakir, as is customary with his class, demanded a share of the contents of the goni-bags; but the Banyan, reluctant to part with his property, and, at the same time dreading to encounter the mendicant's wrath, replied that the bullocks were laden only with stones. "Stones let them be," rejoined the irritated saint, and the Banyan drove on his cattle. But by-and-bye the bullocks began to exhibit symptoms of the utmost distress. One after another fell down under the weight of its now ponderous burden. The Banyan, seeing his mistake, returned to the Fakir, and, entreating his forgiveness, earnestly besought him to withdraw his curse, and restore his wares to their original condition. At his command he emptied the sacks, and filled them anew with leaves from the neighbouring trees, which, after he had advanced a little on his journey, were found to be all converted into gold mohurs and rupees. The spherical and oval stones that are now met with scattered around the spot are the veritable petrified fruits that the Banyan left behind, and to this day bear witness to the truth of the transaction. This fable, though received by Hindús with their usual love for the marvellous, is evidently of a common origin with a similar legend current in Palestine. Instead of *Gidad* Hill read Mount Carmel; for Shek Jarid substitute the prophet Elijah, and the merchant with his nutmegs and betelnuts change into a gardener with melons; and the two stories, in their main features, are identical. After this I need scarcely add that the so-called petrifications, that attest the reality of the miracle exhibit no trace of the vegetable struc-

ture of genuine fruits, but are simply nodules of zeolite, that have issued from the trap cavities in which they were formed.

The *Freshwater Formation*, which really does yield fossil fruits and other organisms, is nearly co-extensive with the great outpouring of basalt on the west of Nagpur. Whether it ever existed where there is now no trap to be seen is a question which I shall not stop to discuss. But it is a remarkable fact, that wherever there is overlying diorite to preserve it, there the freshwater deposit is almost sure to be found, unless it has been burnt up by the intrusion of amygdaloid. We have traced it well nigh without interruption for 100 miles towards Elichpur, and throughout the whole distance differing often in colour and composition, in outward appearance and inward structure, but still maintaining the same general relation to the enclosing rocks. It is to be met with of all hues, and of all mixtures of tints : at one place it is calcareous, at another siliceous, and at a third clayey. Here it is crystalline, there cherty, and again scoriaceous. In one spot it is full of fossils, in another and neighbouring locality it is utterly devoid of all traces of ancient life. I know not one intrinsic feature that is characteristic of it. In judging of its identity, the only sure guide to go by is its position between the nodular trap above and the vesicular trap below. Though it must be spread over vast table-lands of different elevations, yet it is almost exclusively on the escarpments of these that we can acquire any knowledge of it. Generally the imbedded stratum occurs at a distance of 15 to 20 feet from the flat top of the eminence, just at the place where the water in the monsoon, running down the slope, has gathered strength sufficient to make an impression on intervening barriers, and whence it proceeds to plough up the soft deposit, and the still softer subjacent amygdaloid, till it reaches the bottom, leaving an interval between each runnel like a rounded talus. In making your way up the ascent, your attention may be attracted by a number of blocks at the foot, which have fallen, or been washed down, from the site of the deposit. These increase the nearer you approach the exact spot ; and if they suddenly cease, you may be sure, whether you have observed it or not, that you have just passed by the stratified rock, and come upon the nodular basalt. The thickness of the deposit is very various. It ranges from 6 or 7 feet to an inch. The former must have been its original development in this part of India ; and where it has been reduced, the change must be attributed to the amygdaloidal intrusion from beneath. In the neighbourhood of Nagpur it does not average a thickness of more than one foot : where it is greater, the upper portion is generally indurated, and the

lower remains soft. It is in the former that most of the fossils are found, though where the latter consists of a green and purple clay, the calcareous nodules, which have been aggregated in it, for the most part enclose organic remains. Among the fossils which this formation yields are the following :—

Mammalia or Reptilia (?)—In addition to the part of a femur and the phalanx, before alluded to, as having been found at Junyápani Chonki, which I am inclined to refer to this deposit, there have been discovered in it, about two miles west of Nagpur, a portion of a vertebral column, consisting, apparently, of eight vertebræ, and, not far from the same spot, a number of minute bones, in a detached and very fragmentary state, belonging to all parts of the animal structure. Whether these remains of quadrupeds are exclusively of reptiles, or whether some of them may not also be mammalian, I do not possess knowledge enough to warrant my expressing an opinion ; nor is it necessary that I should, seeing they are to be transmitted to London, and will soon be examined by those who are competent to the task. But I may mention, that the teeth discovered among them indicate the former existence of saurians at the locality, one tooth being small and obtusely conical, with a barbed point, and another species, which is very abundant, being comparatively flat and lancet-shaped, with the enamelled side of a darkish slate colour. To this class also may, perhaps, be referred a claw, half an inch long, brought to light at Telankhedí, three miles west of Nagpur ; while the stratum at Machhaghodá has furnished the impression, apparently, of a freshwater tortoise.

Fishes.—Remains of this class are found at Tákli and Machhaghodá, but chiefly at Páhádsingha. They consist for the most part of scales, some of the Ganoid and others of the Cycloid orders. The Ganoidians are probably to be referred to the Lepidotoids, to which the spinous rays collected with the scales may have belonged. The alternate depressions and elevations, which radiate from the centre of the Cycloidian scales, are beautifully preserved ; some have 12 of each, and others a smaller number. One specimen, as was pointed out to me by that well-known naturalist Dr. Jerdon, has constituted part of the lateral line, and still bears the tube through which the mucus flowed that anointed the surface of the body. But the most curious object that has been met with in this department is a piece of a roe found at Tákli, in the two lobes of which the ova that had been matured are calcedonised, while countless minute granules are seen lining the ovarian membrane.

Insects.—The exuvixæ of this class are more numerous than might have been anticipated. They are found only at Tákli, and are chiefly elytra of beetles, of which 9 species have been discovered, 7 having rewarded the investigations of Mr. Hunter. Some are allied to the Buprestidæ, another, in the opinion of its accomplished discoverer, is connected with the (soft-bodied) Heteromera, while two tuberculated elytra may possibly have belonged to some other family of the same tribe. In one of the fruits, to be mentioned below, there was found a hollow tube binding together several of the surrounding seeds, and absorbing the juice of their enveloping pulp : this was, perhaps, the work of some one of the Dipterous order ; and on a piece of silicified wood, which at the period of its deposition must have been considerably decayed, there was discovered a large number of little round opaque bodies, regularly arranged in a hollow. Can these have been the eggs of one of the Lepidoptera ?

Crustacea.—Of this class no order occurs except the Entomostraca, comprising the genus *Cypris*, with 6 species, all new, so far as I am aware ; and a very interesting genus, which I am disposed to consider allied to *Lynceus* or *Daphnia*.

Mollusca.—These are very numerous, consisting of *Melania quadri-lineata* (Sowerby), and perhaps another species of the same genus not described ; *Paludina Deccanensis* (Sow.) and 8 species not named ; 4 species of *Valvata*, new ; of *Limnæa*, besides the *subulata* (Sow.) 5 new species ; of *Physa* in addition to the *Prinsepii* (Sow.) 4 or 5 new forms, that may constitute as many species ; of *Bulimus* 2 new species, with 12 other species that may be referable to the same genus ; *Succinea* 1 species, and *Unio Deccanensis*. Most of the Paludinæ have been found at Tákli, along with the two well-marked species of *Bulimus*. Telankhedí has supplied all the *Limnææ*, the doubtful *Bulimi*, which in many cases retain a stripe of colour on the shell, and the single species of *Succinea*, of which only one specimen has been met with. One species of *Valvata*, with a pretty striated spire, most frequently truncated, is found exclusively at Tákli. Another, also striated and conoid, leaves its impressions abundantly on the rock around Nagpur. Two without striæ occur at Machhaghodá, one carinated above and sometimes conical, and at other times oblong-conical, and the other discoidal, and so minute as scarcely to be visible by the naked eye. *Physa* is the genus most extensively diffused, having been collected in all places where the deposit is fossiliferous. Besides the *P. Prinsepii* (Sow.) there is one new form found at Telankhedí, which presents obvious specific differences ; and there

are several others varying from both of these, but by such gradual changes, that, under a sense of incompetency, I have sent them all to London for determination. The only remaining shell that has fallen in our way is *Unio Deccanensis*, (Sow.) which was obtained by Mr. Hunter at Chikni, the locality pointed out by Malcolmson, which is the only locality for it that I as yet know of within the territory of Nagpur. The specimens of it that occur there are far from good, when compared with those kindly sent me from the neighbourhood of Elichpur by Dr. Bradley. That able and zealous geologist has also furnished me with excellent specimens of *Physa*, the forms of which agree with those common in the vicinity of Nagpur.

We pass now to the vegetable kingdom, the specimens of which from the freshwater formation are both rare and varied. They may be classed under the heads of fruits and seeds, leaves, roots and wood.

Fruits and Seeds.—Of these there are about 50 species. The order of the Exogenous sub-kingdom, that has most representatives, is the *Leguminosæ*, there being 4 species very obvious, viz. two *Hedysarææ*, and other two, including a *Cassia* of the more regular flowered division of the order. Under the same head may be arranged what appears to be a *Faboidea* of Bowerbank, a double-seeded fruit resembling the *Xylinosprionites* of the same author, and a three-seeded one, occurring sometimes with two seed-vessels, and at other times with three, which may have been a *Hedysarææ*. The most abundant order of Endogens is *Aroideæ*, of which there are two genera, with compound fruits, one with three-seeded ovaries, in size and outward appearance being exceedingly like a small pine-apple, and the other genus bearing a distant resemblance to a mulberry, having, however, the seeds in each vessel symmetrically disposed in sixes. This latter genus contains two species: one, that must have had a rich purple pulp, was upwards of an inch in length and half an inch in breadth; and the other extended to 2 inches long, with a breadth not exceeding $\frac{1}{2}$ of an inch. Next to the *Aroideæ* the most interesting Endogens are *Palms*, of which there seem to be two genera, one a *Nipadites*, (Bow.) and the other one a transparent piece of calcedony, whose place in the order cannot exactly be assigned. For the latter rare specimen, as well as for the larger mulberry-like aroid fruit, and many other fruits and seeds, we are indebted to Captain Wapshare, whose co-operation in this field has proved of the highest value to Indian palæontology. The fruits above specified, in common with those not mentioned, are almost all found at Tákli. The only exceptions worthy of notice are one of the *Hedysarææ*, which was laid open in a stone from Machhaghodá; separate ovaries of the larger six-seeded

aroid, which are found along with fish-scales at Pahadsingha, and the *Chara Malcolmsonii*, which is met with, though not abundantly, wherever the deposit contains organic remains.

Leaves.—Of these there are 12 kinds, seven of which are Exogenous. In some of these the secondary veins strike off from the primary at a very acute angle, and in others not so acute, while in one of orbicular shape they radiate from a central point like the leaf of *Hydrocotyle*. The Endogenous leaves are five in number, some of which possess a considerable similarity to those found in the Bombay strata, and figured in Plate viii. of this Journal for July 1852. All these have been obtained at Tákli, as also the roots.

Roots.—These amount to five in all, none of which are much above an inch in length. The most conspicuous forms among them are those that are somewhat like a cocoon, marked by the scars of sheathing bracts. Of such tubers there seem to be three, differing in certain respects from each other, and agreeing in number with the three aroid plants, with which they are found invariably in juxtaposition. The similarity of one root in all but the size to that given in Plate vii. fig. 1 of the able paper just referred to cannot fail to appear on the most cursory examination, and may serve to fix the place of the latter in the vegetable kingdom, as well as create the hope of finding near Bombay some aroid fruit which it has produced.

Wood.—There seem to be three kinds of Exogens and two of Endogens. In some cases the former retain their bark, while the latter, as has been observed in other Indian localities, occasionally display their aerial roots. Specimens of wood are common in almost all fossiliferous parts of the territory.

From a review of the whole fossil contents of this formation, the inference to be derived appears to be, that it cannot be more recent than the Eocene era. Brown, in his Index, has set it down as of the same age with the Continental *Molasse*; but the facts, that out of the many shells it has embedded not one within my knowledge is specifically the same as any now existing, that there is almost an equal number of Ganoidian with Cycloidian scales, and that the fruits bear a remarkable resemblance to these found in the London clay of the Isle of Sheppey in my humble opinion fully warrant the belief that it is one of the oldest of tertiaries. On the tempting theme of its extent throughout India I forbear to enter.

VI. *The Sandstone Formation.*—The next fossiliferous formation occurring in the Nagpur territory is composed of beds of sandstone. The uppermost strata, called in Maráthi *Khárpá*, are frequently sepa-

rated by an iron band, styled *Khatu*, from the middle ones, which go by the name of *Páreshá*. These, as formerly mentioned, are succeeded by lower beds, which, like the superior strata, are called *Kharpá*. The average depth of the upper strata may be 25 feet, and of the middle 15 feet. That of the inferior beds is unknown. Though there is a general conformability between the highest strata and those beneath them, the latter have been broken up at Bhokára, and the same thing must have happened in the neighbourhood of Kámpti, if we may judge from the number of angular as well as rounded fragments that have been deposited about the period when the formation of the uppermost beds was terminating. It is in these embedded blocks that the most valuable of the Kámpti fossils are discovered. Lower down in the highest strata, just before reaching the usual position of the iron band, the first organic remains are met with *in situ*. They are compressed stems of trees, one of which, presenting its thin edge in the side of a quarry at Silewádá, may be traced for about 20 feet. But it is under the iron band in the fissile slabs of the middle beds, which are much used for architectural purposes, that most of the fossils lie.

In the sandstone, as yet, there have been discovered no animal remains but those of—

Mollusca.—These occur only at Mángali, 60 miles south of Nagpur, and consist of two species of minute *Cyrena*, (?) one, which is the smaller, being globular, and the other flatter and more elongated.

The vegetable remains are exceedingly abundant, and are to be found in all places where the middle beds appear. They have also been recently discovered in a similar position near Elichpur, by Dr. Bradley. As they are met with at Nagpur and the surrounding country, they include seeds, leaves, and stems.

Seeds.—Four species. Of these the first two discovered were found at Bhokára. Notwithstanding their being smaller, they are evidently related to two of the forms of *Carpolithes* figured by Lindley and Hutton in their *Fossil Flora*, vol. iii. p. 193. The third kind of seed was first met with at Kámpti, by Mr. Sankey, to whom I am under many obligations for this, as well as other favours. Shortly after Captain Wapshare and I found it at Tondakheiri, 14 miles N.W. of Nagpur. A fourth seed, which occurs at Silewádá, is lanceolate, and very minute. Under this head may, perhaps, require to be comprehended a circular depression, resembling in size and form the impression left on wax by a pretty large key, which was discovered by Captain Wapshare at Bhokára.

Leaves.—*Dicotyledonous* 2. One a leaf of a conifer, about 1 inch long and $\frac{1}{4}$ inch broad across the middle, midrib included. It has obviously been a strong inflexible leaf, and with its sharp point may have been rather formidable. A small piece of *Zamites* from Kámpti, not $\frac{1}{2}$ inch long, and yet it gives off from its tiny midrib 20 pennules, each containing 6 or 7 microscopic veins. There are several leaves observable in the strata at Kámpti, apparently *Monocotyledonous*. One kindly contributed by Mr. Sankey is 17 inches long and $\frac{3}{4}$ inch broad. Before deposition it had been split in two for about two-thirds of its length. It may possibly be the leaflet of a large *Zamites*; but I am disposed to consider it rather a *Poacites*, with very minute venation. The same may be said of another curious object, which has left 42 parallel lines stretching across a confused mass of vegetation, for a distance of 3 inches, and with a breadth of $\frac{1}{4}$ of an inch.

But the most common and beautiful leaves which the sandstone formation produces are the fronds of Ferns. They include—

Pecopteris.—Of this genus but few specimens have been found, and these at Kámpti only. They are, however, of two distinct species. A pinna belonging to one of these species is furnished on each side with 11 pinnules, endate at the base, and with a central vein, reaching to the apex. A specimen of the other species is very perfect, and presents four bipinnate fragments, lying together in such a manner as to indicate a tripinnate frond, pinnæ with from 8 to 10 pinnules on each side, the venation much branched, and without a central vein extending to the apex.

Glossopteris.—The species of this genus are very numerous, amounting to 10, and all in excellent preservation. With their large iron-coloured fronds and distinct veins, and in several instances with their perfect fructification, they form the most interesting fossils of the vegetable kingdom that I have ever seen. The species differ from each other in size, shape, venation, and arrangement of the sori. One of them is upwards of 20 inches long and 3 broad, while some slabs are entirely covered with a species little more than 3 inches in length. Some have the venation coarse, others fine; some have it starting from the midrib at a very acute angle, others nearly at right angles. The sori in all cases are dot like; but in some they are large and round; in others they are small and elongated; in some they are placed chiefly along the margin, in others with 4 or 5 rows: they fill up almost the whole of the frond. This genus is the most widely diffused of any in the formation within the Nagpur state. It has been

found at Chándá, and also at Chorkheiri, a distance of 120 miles, and at intermediate places. The locality that has furnished most species is Silewádá, whence I was favoured with a magnificent slab by Captain Wapshare.

Cyclopteris.—One species of this genus has been discovered at Tondakheiri, along with the coniferous leaf: length $2\frac{1}{2}$ inches, breadth 1 inch. The frond is crowned with fructification in form like the flower of a cultivated cockscomb. Another species met with at Kámpti is much larger.

Sphenopteris.—The specimens of this genus which are imbedded along with those of *Pecopteris* are much mutilated; but the small fragments that are found exhibit a very elaborate, though clear, venation.

Tæniopteris.—Two species, one narrow, with secondary veins straight and perpendicular to the median, the other very broad, with secondary veins, curved and oblique.

Stems.—These are very abundant at Silewádá, including genera of which I can find no traces in any *Fossil Flora* to which I have had access. They are apparently *Exogenous*, but do not preserve the structure of the wood. They have possessed a well-defined bark, which is often obliquely striated, and exhibits the cicatrices of leaves, with a bud occasionally left after the foot-stalk had fallen off. Some of the scars are longitudinal; others are transverse, and embrace a considerable part of the stem. They are in general sparsely distributed, in one large stem 3 feet long, and upwards of a foot broad, there being only a single scar apparent. Besides these *Exogenous* stems, of which there are four or five different genera, there was one discovered at Mángali, along with *Cyrenæ*, which can be distinctly referred to the conifers, from the lattice-like disposition of its scars. The wood of a coniferous stem, converted into silex, but retaining no traces of its bark, was dug out from the road near Chándá. Other stems, preserving the wood, but so altered by iron that the structure cannot be determined further than that it must have been *Exogenous*, occur in abundance at Silewádá. On the other hand a stem embedded in the rock at Mángali exhibits every mark of having been *Endogenous*. The portion obtained is like a thin rattan, 14 inches long, without any apparent joint. Under this sub-kingdom must also be classed—

Equisetites, or according to Bunbury *Asterophyllites*.—The peculiarity of the specimen of this genus which was discovered by Mr. Hunter at Silewádá, as well as of a Yorkshire one, figured in the *Fossil Flora* (vol. iii. p. 186), under the name of *Equisetum laterale*, is that it is

always found associated with little round discs, having "lines radiating from a common centre, something like the phragma of a calamite." The authors of the *Fossil Flora* were uncertain whether the discs belonged to the stem, near which they are found; but in the Silewádá specimen, the round bodies, of which there must have been two and two opposite each other at the articulation, partly retain their original position, and partly have fallen out, leaving a radiating hollow to show where they once had been. A very common plant at the deposition of the sandstone was the—

Phyllotheca.—In giving this name to the genus that has hitherto been called *Calamites* in India, I follow the high authority of Brongniart and McCoy, who have described specimens from Australia. The opposite sulcation of our Indian genus clearly separates it from *Calamites*. What place it ought to hold in a classification remains doubtful. Göppert ranks it among Monocotyledons, immediately after *Equisetites*, while McCoy compares it with the *Casuarina*. I have not been able, in the numerous specimens which I have met with, to verify the opinion of the latter eminent geologist, not having detected either bark or a phanerogamous fructification. There appear to be in all nine species collected from Bhokára, Silewádá, and Kámpti, differing in the number of *sulci*, which range from 6 in the semi-circumference to 31. Two from Kámpti were sent to me by Mr. Sankey, and one from Silewádá by Captain Wapshare.

Vertebraria.—This is the strangest genus among our Nagpur fossil plants. Hitherto it has been described from specimens obtained exclusively from the Indian and Australian coal-shale. This has led to a limited view of its nature. McCoy's generic character applies merely to the radiated body, which is found in connection with the main stem, and which he believes to be made up of a "slender stem surrounded by densely aggregated whorls of verticillate cuneiform leaves, having a dichotomous venation." Of the correctness of this description of what was before the author at the time, I have no reason to doubt, but it is quite inappropriate, when it comes to be predicated of the sandstone specimens. These have no slender stem or densely aggregated whorls of leaves. On the contrary, the main stem is thick, marked with two rows of oblong, rounded, or angular elevations and depressions, and giving off branches and twigs at different intervals, and in all directions. Mr. Sankey forwarded to me the first sandstone specimen from Kámpti, and in the same week I found it at Tondakheiri, and more recently at Chándá.

Such are the principal fossils of the Sandstone, properly so called.

Beneath it occur some beds of Shale, which may be held as part of the same formation. These strata are developed in the district north of Chándá, and between Koohádi and Bhokára, where the red shale contains the following organic remains :—

Reptilia?—A footmark, of $\frac{1}{2}$ of an inch long, and as much broad, with the impression of five (?) claws. Three specimens have been obtained, each exhibiting only one print. The shale, which is very brittle, does not admit of a surface of more than a few square inches being procured. On the same specimens as bear the footmarks are seen the tracks of—

Lumbricariae (Earthworms).—That these animals have been of the nature here indicated will be evident to any one who considers the appearance of the furrows : the way in which the head has occasionally been pushed forward, and then withdrawn ; the tubular holes by which the ground has been pierced, and the intestine shaped evacuations which have been left on the surface. Worm borings have been found in the green shale of Tadzádi, 70 miles south of Nagpur.

The only vegetable organism which has been discovered in the shale is a sulcated plant, which most probably belongs to the genus *Phyllothea*, but, as a sufficient length of the stem has not been obtained to display the articulation, its precise character cannot be fixed.

VII. & VIII.—*Limestone, Metamorphic and Granitic Rocks.*—Immediately below the Red Shale lie the Marble Beds at Korhádi, which having been dolomitised by the action of heat, no trace of any organised being can be looked for in them. Directly beneath the marble occur various Metamorphic Rocks, disturbed by Granite. Quartz rock is remarkable in the Wein Gangá basin for the rich iron ore which it contains. Kandeshwar, a hill not far from Weiragad, is just a mass of iron ore.

In looking back upon the lowest fossiliferous strata, whose position, in reference to older rocks, we have just indicated, the resemblance in the succession of beds between Southern and Central India is very evident. In both there is the same series of sandstone resting upon shale of various colours, but including green and red, which again is underlaid by limestone and the metamorphic rocks. Though Malcolmson was wrong in inferring the identity of the sandstone of Central India with that of the Peninsula, from the occurrence of diamonds at Weiragad, which we have seen to have no connection with sandstone there, yet the facts he has supplied in regard to the order of the various strata in the south, when set against

the succession observed around Nagpur, in my opinion fully establish the point. If, then, the sandstone of Nagpur is the far-famed diamond sandstone, it is of importance to inquire into the *mode* and *date* of its formation.

The great abundance of land plants proves that land must have been very near, which would favour the supposition that the water in which the strata were deposited was not that of the ocean. Again, the occurrence of two species of what appears to be *Cyrena*, when taken in connection with the absence of all decided marine shells, would lead us onward to the belief, that the body of water which could have so many land plants floating all over it was not salt but fresh. This conclusion cannot, as it appears to me, be invalidated by the supposition that the freshwater shells may have been carried down into an arm of the sea ; for they are too abundant and entire to have been subjected to such a process. Nothing but the idea that these freshwater shells lived and died on the spot where their bivalves are entombed can, in my opinion, meet the requirements of the case. The freshwater origin of the formation seems to be confirmed by the appearances presented by the littoral deposit of the shale. Though there are reptiles and worms that choose the sea shore for their abode, yet we can more readily conceive the animals, which left their traces so sharp and clear on the ancient mud to have inhabited the banks of an extensive lake. The only objection, of any weight, that can be urged against the view here advocated, is the occurrence of *fucoïds* in the Coal Measures of India—a formation which, where it exists, underlies the diamond sandstone. But, perhaps, it is sufficient to reconcile both views to suppose that during the deposition of these strata, though not of the others, the salt-water was let in, and with it a marine vegetation, which was mixed with the land plants that abound in the coal as well as in the sandstone. The marine beds so rich in shells in Cutch seem to be superior to the strata which come under our observation in Central India, and, therefore, are not to be compared with them.

But this brings me, in conclusion, to point out the era at which the Nagpur sandstone was probably formed. I think there are good grounds for believing that it is contemporaneous with the Lower Oolite. The discovery in it of earthworms which are found in that formation ; of seeds analogous to those which occur there ; of *Pecopteris*, *Cyclopteris*, and *Sphenopteris*, which are common to the true Coal Measures and the Lower Oolite ; of *Equisetites*, with its radiated discs, which is peculiar to the latter, and of *Zamites* and *Tæniopteris*, equally

characteristic of the same formation, leaves no doubt in my mind that the most ancient division of the Oolite is that to which our sandstone, and, of course, the coal associated with it, belong ; and if my indentification of the Nagpur strata with the diamond sandstone of the peninsula be correct, we may yet look forward to numerous additions to our *Fossil Flora and Fauna*, when the extensive fields of the south are explored with an eye to organic remains.

I cannot close this paper without returning my best thanks to Dr. Leith for the generous manner in which he has supplied me with books bearing on its subject ; which I found all the more valuable from their extreme scarcity at an inland station.*

* For "*Xylinoprioides*" p. 68, read "*Xylinoprioides*"

ART. IV.—*The Ancient Iranian Mythology: a Letter to the Rev. Dr. WILSON, Honorary President of the Society.* By Professor N. L. WESTERGAARD, of Copenhagen, Honorary Member.

Presented, 21st April, 1853.

Copenhagen, January 29th, 1853.

* * * * I send you a specimen of the ancient Iranian mythology, in which I have tried to solve those mystical enigmas, and to represent, according to my views, the ideas and notions which were originally connected with *Yima*, and the other beings of the same class of mortals. My paper was originally written in Danish for my countrymen, and has been translated by a young Englishman, a pupil of mine, and revised by myself.

The most ancient Iranian ideas of *Yima*, and the beings connected with him, belong to that category of mythic tales, which has for its more immediate subject NATURE, the natural powers and effects, man and his destiny. This cycle of mythic ideas, as you know, is represented and painted under the form of corporeal personification, a series of symbolical emblems, which vary in the different mythological systems only according to the way of thinking and to the stage of mental cultivation of the respective nations. What remains of the *Zendávesta* is no doubt comparatively small, and in many instances very defective; and, therefore, there is much which must remain dark and unintelligible. Meanwhile, the mythology relating to *Yima* is among the clearest, and possesses a peculiar interest, since, as you know, we find here an agreement with the doctrine of the *Vedas*, which likewise affords us an insight into that altogether ante-historical time, when the Japhetic nations of India and Irán in community began to develop their religious and social existence. To such a time the resemblance in the names must be ascribed, *Yima* being the Iranian, and *Yama* यम the Indian, form of the same word, the original signification of which, however, is not quite clear to me. The same connexion is found in the name of his father, *Vivanghat* and *Vivasvat*, which is to be derived

from the Sanskrit root वृश् , to shine and to burn, and *Vivasvat*, accordingly is used as an epithet of several luminous divine personifications, e.g. *Agni*, *Ushas*, and especially the Sun. In the *Zendávesta*, *Vivanghat* himself is only mentioned in one passage (*Yaçna* ix. 4, 5) as the first mortal who extracted the juice of the sacred *Soma* or *Haoma* plant, and was rewarded, as is said, with the gift of the son *Yima*, who, therefore, in several passages, is mentioned by the names of *Vivangahna* and *Vivanghusa*, the son of *Vivanghat*, just as *Yama* in India was called *Vai-vasvata*, the son of *Vivasvat*. With the common origin and original ideas of the mythic tale, (to which I shall return,) with the common father and the common names, the resemblance ceases; and the very ground on which the idea was developed was different in India and Irán. In the former country, *Yama* was referred to the other world—to a spiritual, immortal existence, and the abodes of the blessed, whilst in Irán *Yima* was connected with the present life, material existence, and this earth, and was, therefore, like his father, represented as a mortal being.

Yima is generally called *Khs'aeta*, and *Huvathwa*. The former epithet denotes a ruler, or the glorious one, and is usually also added to the name of the Sun, *Huarekhs'aetá*. The second (*Huvathwa*) signifies having good offspring or progeny. The origin and meaning of this name is clear from the tradition concerning *Yima* found in the first half of *Fargard* ii. of the *Vendidád*: there we are informed that *Ormazd* (*Ahura-mazdá*), called *Yima*, first among all mortals, to be a teacher and bearer of his holy word; but *Yima*, feeling himself unequal to the task, declined the office. *Ormazd* then calls him to fertilize and extend his worlds, to be their keeper, protector, and ruler. This office *Yima* undertakes, praying that cold and hot winds, sickness and death, may be excluded from his kingdom. He likewise asks *Ormazd* to teach him the mysterious word, by which he might subdue the hurtful demons. (Such, at least, I suppose the meaning to be of the closing words of the prayer, which evidently have been handed down to us in a very mutilated and fragmentary state, though not at all on that account spurious or interpolated.) *Ormazd* then presents him with a golden plough, and a gold-formed goad, symbols of agriculture and cattle-breeding. *Yima* now fertilizes the earth; or, according to the expression used in the *Vendidád*, *Yima* is in woman's womb; and after 300 winters (*zimo*, not *zemo*, countries,) have elapsed, the earth is thereby filled with living beings, ("large and small cattle, men, dogs and birds"), and likewise with red, shining, flames; and there is now no room for the living to move. At the command of *Ormazd*, *Yima* rises, to use the original expression, "towards the light, at midday, opposite

the path of the sun ;" consequently, when the day was shining in its brightest splendour. He furrowed the earth with his plough and pierced it with the goad ; and in answer to his prayer to the earth, the latter expanded, and became larger by one-third its former size, so that there was now room for every one to move according to his will and inclination. When 600 winters had elapsed, the earth was again filled, and again *Yima* caused it to expand to the extent of two-thirds its former size, but after 900 winters the earth again was filled, and *Yima* by his prayer extended the earth for the third time, so that it became larger by three-thirds its former size ; and again there was room for all to move according to their will and inclination. The vast extent of the earth was thus, according to the idea of the Iranians, essentially attributed to the exertions of *Yima*. He fertilised the extended earth by agriculture and cattle-breeding, and filled it with living creatures. But he likewise—and this was his peculiar and permanent office—took especial care of the creature's welfare, and he obtained, by his prayers, from Ormazd and other divine beings, the power necessary to the fulfilment of this office. The general manner in which the activity of mythical beings is represented in the *Yashts*, (the chief source of Zend mythology,) is the form of a prayer. They are represented as asking different divinities for power to do what is of importance for them. The prayers of the good are then answered, but those of the bad rejected. The doings of *Yima* are, therefore, thus described :—" Let me bestow fecundity and posterity ; let me confer immortality on the creatures of Mazdá ; let me drive away from them hunger and thirst, old age and death, the cold and the hot wind, for a thousand years." (*Gosh Yasht*, 9, and *Ashi Yasht*, 29.) "Let me obtain supreme power over all people, demons and mortals, magicians and fairies, and the hostile beings that cause deafness and blindness : let me deprive the demons of their glory and happiness, their offspring and fecundity, their contentment and renown." (*Abán Yasht*, 25.) "*Yima* is the brightest (or happiest) of those that are born ; he is like the sun amongst mortals ; by his power he obtained for men and cattle freedom from death ; he prevented water from being dried up and trees from withering, that they (the creatures, beings) might eat food not to be diminished. By his might there was neither cold nor heat, neither old age nor death, nor envy created by the demons." (*Yaçna* ix. *Rám Yasht* 15.) As long, then, according to the ideas of the Iranians, as *Yima* reigned, and this was for the space of a thousand years, neither hot nor cold winds did blow ; neither heat nor cold was experienced. The seasons, consequently, were constantly mild and pleasant : men were exempt for all bodily wants ; not suffering from

hunger and thirst, because the food never diminished, as the water never dried up, nor the fruit-trees withered. Not only did *Yima* bestow fecundity on living creatures, and bless them with posterity, but they were also exempt from the consuming effects of time—*Yima* having brought immortality to them, so that they never grew old, but perpetual youth prevailed, and, as we read, “father and son both came forward as youths of fifteen in growth.” (*Yaçna* ix.) There was therefore no sickness nor death; men and beasts were immortal under the reign of *Yima*. At that time, accordingly, men were blessed with all the kindly gifts of nature, and lived, besides, in peace and love with all around them; envy and hatred, created by the demons, not having as yet insinuated themselves into their hearts. *Yima* had, moreover, power over the demons, and did deprive these of the power of hurting, as well as of the contentment and happiness which had fallen to the lot of earthly beings.

As *Yima* was born of a bright and luminous father, so his abode was likewise connected with light. The mountain *Hukairya* (beautiful in shape), which is likewise called the all-beaming, the golden, was the place whence his efforts in behalf of mankind proceeded. It was the highest summit of the lofty mountain *Haraiti* or *Hara*, (or, to use the later name, *Alburz*, that mythical mountain of the east, which formed the boundary between the transitory and the eternal world, and was the place whence *Mithra*, the genius of light, illuminated the whole world, and where, therefore, neither night nor darkness was to be found.

From these mythic tales about *Yima*, I think, we may perceive the idea originally connected with him; and Professor R. Roth, at Tübingen, has already a few years ago considered *Yima* as the symbolical representation of the golden age, with all the blessings of abundance and peace. To this I shall only add, that *Yima* certainly is the symbolical representation of the golden age, or (as every man has his golden age, however short it may be) the symbolical emblem of the happiest time of man, the brightest state of life, but only as far as this depends on the earthly or material well-being, furnished by the physical blessings of nature; because *Yima*, being, as we may remember, unable to bestow on men the holy word, or knowledge of God, he could not be the symbolical expression of that happiness which is unattainable without that knowledge. The same original idea was, in my opinion, connected by the Indians with their *Yama*: he, too, likewise, was a symbolical representation of the golden age, an emblem of the happiest and brightest state of man. But, though the Hindu embraced life and its blessings

with as much loving attachment as all other earthly creatures, he was less ensnared by its pleasures; for his depth of thought, and serious disposition of mind, led him to form a more correct estimate of the transitory nature of earthly enjoyment. His attention was, therefore, turned to the life beyond death: it was there he sought for, and there first he found his real home. The kingdom of the dead was, consequently, in his eyes, not a dreary abode of pale and gloomy spirits, deprived of all enjoyment and pleasures; but (as was also the case in the Scandinavian mythology) endowed and provided with all that was fairest and most glorious—a place at which it was joy to arrive. There, and there only, he found the real golden age; and *Yama*, consequently, reigned in India *immortal* in the land of the blessed. The Iranian, on the other side, looked more at the present world. His ideas of *Yima* and the golden age became then naturally connected with this earth and the present life. This *Yima* was, therefore, a *mortal* being, living only in, and for the sake of the transitory world; and, consequently, perishable with it. Though in the mythology connected with a particular time he was not only the symbolical representation of a vanished golden age, never to return, but also, in general, (as hinted at above,) the symbolical emblem of every man's happiest material condition; and when, for instance, the day in its brightest splendour revealed all the glory of nature,—when genial seasons produced an abundance of all the gifts and blessings of earth,—when man lived in his fullest vigour, at peace with himself, and in love with all around him—*Yima* was still beheld reigning on earth, and spreading his blessings around him; and therefore it is said in the Farvardin Yasht—“We must worship the prototype (*fravashi*, *feroher*,) of *Yima*, the son of *Vivanghat*, the true and powerful, having good offspring ... to avert the evil caused by demons, the drought destroying the fields, and the consuming decay.”

This bright and happy state, of which *Yima* is the symbolical emblem, was, however, perceived by the ancient Iranians to be of a transitory nature. He sought for the reason of the interruption or suspension of his happiness, and found it in man himself—in *Yima's* own transgression. The tradition respecting this is found in the so-called *Zemnyád Yasht*, which, having stated the doings of *Yima* in the same manner as the other sources, adds that this bright condition or happiness, *Khareno*, attended *Yima* because his affections were free from evil, and continued until lying and falsehood entered his mind. This was the reason assigned by the Iranians for the loss of happiness, and lying was held in general abomination, not only in those countries in Northern Irán (Bactria, &c.)

which furnished the origin of the *Zendávesta*, but to an equally predominant degree in Western Irán. The assertion of Herodotus is well known, that the Persians taught their sons but three things—to ride on horseback, to draw the bow, and to speak the truth; and Darius, the son of Hystaspes, in one of his inscriptions, asks Ormazd to protect his kingdom from three evils—hostile invasion, sterility or failure of crops, and falsehood. “When *Yima*,” continues the *Zemyád Yasht*, “had admitted lying and falsehood into his mind, bright happiness departed visibly from him in the shape of a bird, and *Yima*, not perceiving any more the happiness to shine, sorrowed and stooped down to the earth.” Three times, as the *Yasht* informs us, happiness did fly away from *Yima*, but not to him was it given to recover the vanished bliss. *Yima*, being the personification of happiness whilst it exists, he must disappear when it ceases, and to contend with misfortune, to arrest the flight of happiness and return it to man, other powers, other mythic beings (*Mithra*, *Thraetaona*, *Keresáspa*,) are required.

The first time, consequently, that happiness flies away from *Yima*, it is seized by *Mithra*, whom Ormazd made the brightest and happiest amongst holy spirits, as *Yima* is amongst mortal beings. *Mithra* is the kind and friendly Lord of Light: he is not, as *Yima*, a mortal being, but a spiritual and immortal one, because the light is not confined to this perishable world only, but, radiating without beginning, it shines also with Ormazd, and in his eternal world. The fleeting happiness which, according to the mythic tale, is seized and arrested by *Mithra*, is, therefore, undoubtedly the bright splendour of day, shrinking before the gloomy darkness of night. But *Mithra* lightens the night with his countless host of stars; he chases the darkness with his light, and restores to *Yima* and the earth the bright felicity of day.

The second time that happiness departs from *Yima*, it is caught by *Thraetaona*. He belongs to the powerful race of *Athwya*, being a son of *Athwya* himself. Like the father of *Yima*, *Athwya* was a mortal being, but all that we learn respecting him from the *Zendávesta* is, that he was the second mortal who extracted the juice of the sacred *Haoma* plant, and was rewarded for this by the gift of the son, *Thraetaona*. The name of *Athwya*, which in this form cannot be explained, has long ago been shown by Burnouf (alas! too early removed, by untimely death, for the sciences) to be the Sanskrit *Aptya* (अपत्या) whence it is derived by metathesis of the two middle consonants *pt*, and the consequent necessary change of *tp* to *thw*. Both forms occur in the later Persian development of this mythic tale, in which the father of *Thraetaona*, or, as he there is called, *Peridun*, is mentioned commonly under the name of

Atbin, more consonant to the Zend, whilst in Ferdausi we find the more Indian like form *Abtin*. The Indian *Aptya* denotes one sprung from the waters, whether flowing on the earth or floating in the firmament. This name is applied in the Vedas to *Trita*, an aerial divinity, and the name of *Thrita* is likewise found in the Zendávasta, but is there attached to an entirely different being or beings, to whom I shall return. There is, however, such an agreement between the doings of the Indian *Trita* and the Iranian *Thraetaona*, that the common origin of the mythic tale is evident, whilst it has been differently developed in the two countries ; on which account the part assigned to the Indian *Trita* has become a more subordinate one than that of the Iranian *Thraetaona*. The latter is said to have been born in the four-cornered *Varena*, mentioned in the list of the Vendidad (Fargard i.) as the fourteenth land created by Ormazd. If this be an earthly land, which I doubt, it must be sought for in the neighbourhood of the west of India, as that country is mentioned as the fifteenth in the catalogue. Meanwhile the land of *Varena* is only mentioned in the Zendávasta in connexion with *Thraetaona* : there he was born, and thence his prayers ascend to the heavenly powers. The *Varena* denotes that which defends, hinders, or bounds in ; and as the epithet four-cornered no doubt alluded to the four corners of the world, and as *Thraetaona* is in reality no human king, but an aerial being, *Varena* seems to denote the extreme and remote regions of the sky, which, as it were, divides heaven from earth, and forms the boundary of the view. The Zend word *Varena* corresponds farther in its etymology on the one side to the Greek *ὐρανός*, heaven, and on the other to the Indian *Varuna*, वरुण, the God originally presiding over the remotest bounds of heaven, (where sea and sky, as it were, melt together,) and who generally in the Vedas is represented as the mythical lord of evening and night, but in the later mythology as the god of the sea only. The Iranian *Varena* may possibly, as a counterpart to the abode of *Yima* on the extreme mountain of the east, principally denote the extreme western limits of the firmament, which every evening conceal the sun and the light, which would account for the adjective *Varenya*, formed from *Varena*, being in the Zendávasta only applied to malign spirits.

The chief exploit of *Thraetaona*, which is often related, but nearly in the same words, was his fight with *Azhi Daháka*, the destructive serpent. This serpent is described as having three heads, and consequently three mouths and six eyes, and possessing a thousand powers : he was of malevolent disposition, and by far the most vigorous of all evil beings, created by the evil spirit *Ahriman* for the destruction of the worlds of

truth and goodness. This destructive serpent is represented in the Yashts Abán and Rám as requesting the mythical beings *Ardisura* and *Vayu* for strength to dispeople all the countries of the earth. His request is of course rejected, and on the contrary both these two and other good spirits confer on *Thraetaona* power to subdue the serpent, together with its zealous and mighty brood. Now, as *Thraetaona* combats the serpent *Azhi*, the Indian *Trita* also fights with a serpent अश्वि; and from this resemblance we learn the import of the Iranian mythos. The Indian अश्वि as well as the Zend *Azhi* (two forms of the same word) denotes a serpent; but as in the East the serpent was the symbol of both moral and physical evil, the word denoting serpent was likewise in India applied to the huge masses of thick and heavy clouds, which during the rains conceal the heaven, and seem to threaten the earth with destruction. At such times *Indra* hastened to the combat; he scattered the clouds with his lightning, and chased them from the sky, slaying *Azhi* or the cloud-serpent, in which combat he was assisted by *Trita* and the divinities of the winds. The same physical and natural representation I find in the Iranian mythos of the combat between *Thraetaona* and the serpent. *Azhi Dahúka*, too, is no doubt the same malign cloud-serpent; and this is the reason why he especially addresses his request to *Ardisura* and *Vayu*, being in fact somewhat related to these beings, who may be briefly said to be personifications of water and wind. (To *Ardisura* I shall have occasion to return.) *Indra* was a *deva* in Irán as well as in India, but, as is well known, the signification of this word *deva* was quite opposite in these two countries, the bright *deva* of India being in Irán an appellation of evil demons, among which *Indra* is reckoned. *Thraetaona*, therefore, could not, like the Indian *Trita*, be an auxiliary of *Indra*; but he performs himself the part of *Indra* in the combat with the cloud-serpent. *Thraetaona* is consequently an aerial being, sprung from the waters of the firmament, and born in the extreme regions of the sky: he is not a *god*, as *Indra*, the lord of bright heavens, but a *mortal* being,—a child of nature and the material world,—and, therefore, perishable, like his parents. The resemblance between *Indra* and *Thraetaona*, indicating consequently the common origin of the mythic idea, is confirmed by a common epithet, which meanwhile can only be rightly explained by the help of the Indian mythology. The huge masses of clouds, personified under the shape of a serpent, are here likewise called *Vritra* (वृत्र) the hiding, hindering one, and *Indra* slaying *Azhi* or *Vritra* is consequently styled (वृत्रहन्) *Vritra* slayer. The same epithet (*Verethrajan*) is applied to *Thraetaona*, and dates evidently from the time when the Iranians lived

in peaceful union with India, as the Iranian *Verethra* has lost that peculiar sense of the Indian वृष, (which is only preserved in *Verethrajan*, and the derivative noun *Verethragna*,) and has adopted a general meaning of victory, or power of resistance; and by this reason, the word has become synonymous with *Verethravat*, he that is endowed with power of resistance, or the victorious; an epithet likewise applied to *Thraetaona*, who is said in the *Zemyád Yasht* to be the most victorious of all victorious mortals next to *Zoroaster*. He, too, had to sustain a combat, but against moral evil, whilst the efforts of *Thraetaona* were directed against physical evil in general, which is caused by those natural powers of the air and sky above the surface of the earth; for his efforts were not confined to the combat with *Azhi*. We are likewise told in the *Farvardin Yasht* that his prototype is to be worshipped to avert sickness caused by extreme heat, to avert excessive rains and inundations, as well as the injury produced by *Azhi*. The mythos of *Thraetaona* is thus founded merely on an incorrect and imperfect though poetical view of nature. He is the symbol or image of those beneficent powers of the air, the efforts of which, it was imagined, were directed against the violence of the hostile and malign influence, to hinder the injury threatened by the latter to the earth. When, therefore, the bright happiness flies away from *Yima*, on account of his guilt,—when the face of heaven is darkened, and the sky covered by black clouds,—when inclement seasons, with all their attendant trouble, exercise a pernicious influence on the physical welfare of man,—when thus all in nature is dark and displeasing—then *Thraetaona* is called into action, and seeks to remedy the evil: he, therefore, is seizing the happiness flying away from *Yima*. With this idea of *Thraetaona* as a kindly aerial being, beneficently disposed towards the earth, another mythic tale concerning him agrees, if I correctly understand its import. This tale is found in the *Abán Yasht*, and its contents are briefly as follow:—“The first *Vafra Naváza* worshipped *Ardivisura*. When pursued on high by *Thraetaona* in the shape of the bird *Kahrkúsa*, for three days and nights he tried to descend towards his own habitation, but could not get any farther; thereupon he prayed to *Ardivisura*, promising her a thousand offerings at the waters of *Rangha*, if he were enabled to reach his own habitation and the earth: she then appeared in the form of a lovely maiden and fulfilled his request.” Now *Ardivisura* is the personification of all the natural fluids, the effects of which are refreshing, animating, fertilizing—*e.g.* the fluids that are in the waters of the earth, and in the rains of the sky, in the prolific strength of man, in the womb of woman, and the milk in her breasts, etc. The signification of *Vafra* is not yet quite

clear to me, although it seems with a high degree of probability to be the Persian *barf*, (برف) snow.

If so, *vafra navâza* denotes the newly fallen snow, and the idea of the mythos would be—The snow leads down towards the earth, its resting place, and consequently its proper habitation ; but as its end might be noxious and injurious to the physical welfare of man, *Thraetaona* seeks to retain it in his dwelling on high. Yet the snow is in fact a part of the real essence of *Ardivisura*, and not, like the destructive cloud-serpent, *Azhi*, altogether evil, without utility. According to its prayer, it is permitted to reach the earth, where its moisture in return exercises a somewhat beneficial influence ; for a slight fall of snow could not be regarded as a positive evil in countries, like Irán, which have always suffered from drought and want of water.

The third time bright happiness flies away from *Yima*, it is seized by *Keresáspa*. He belongs to the family of *Sáma*, of which besides his brother *Urvákhshaya*, and their father *Thrita*, are mentioned. The name of the family, *Sáma*, denotes the bringer of rest, the quieter, calmer or soother, being allied to the Sanskrit root ऋन् ; and this single word indicates the aim of all the efforts of the family in their different directions. As the object of these efforts was mortal man,—as they were intended to promote his well-being, and therefore to cease on his death,—the whole family of *Sáma* must be *mortal*, like man with whom it is connected. Of this family, the *Yacna* (chap. ix.) tells us *Thrita* was the most useful : he was the third mortal, next to *Vivanghat* and *Athwya* who extracted the juice of the sacred *Haoma* plant, and was rewarded by the gifts of his two sons. As to the utility of *Thrita*, and the tendency of his efforts, we are directly informed in the *Vendidád* (farg. xx.) that he was the first of the persevering, bright vigorous mortals, who brought disease to disease, and death to death, and averted burning fever from the body of man. *Thrita*, thus, so to speak, renders disease itself ill and weak ; he breaks its power, arrests the attack of death, and removed the pains of the body, for which purposes he is provided with remedies by *Ormazd* himself. *Thrita*, however, is not of course to be considered as an actual human physician, but as a symbolical emblem or personification of the healing, restoring powers of nature. For this reason he is considered as belonging to the family of *Sáma*, as he soothes and calms the pains and diseases of the body : he is a *mortal* being, like the body with which he was connected. But he was looked upon as the most useful of the whole family, no doubt because man in his infancy, devoid of scientific experience, felt himself in this particular least capable to render any ser-

vice by himself, but entirely obliged to rely on the healing powers of the enduring and indefatigable nature, or, to use the words of the mythic tale, on the healing power of *Thrita*. His name is identical with the above-mentioned Indian *Trita* (त्रित); and the Sanskrit translation of the Yaçna adds, that he was so called because he was a third son (तृतीयो जन्म); and in this case the name must be derived from the numeral *Tri* (त्रि), as we find in the Vedas, or *Dvita* and an *Ekata* (from द्वि and एक), mentioned in connexion with *Trita*.* But I am more inclined to seek the etymology of the Zend *Thrita* in the root *Thrá* (Sanskrit त्रै and त्र), to save or preserve, in which case the name would be significative of his office. He is not the only *Thrita* mentioned in the Zendávesta. In the Abán Yasht mention is made of *Thrita* and *Ashavazdah*, sons of *Sayushdri*; but as these are named in connexion with the war against the hostile nomadic tribes, they seem rather to belong to the ancient traditional history of Irán than to its mythology. This *Thrita* is also mentioned in the Farvardin Yasht, together with a female *Thrita* or *Thriti*, amongst those whose prototypes are to be held sacred; but this is also the case with other persons, who apparently belong to the traditional history only (e.g. all the Káyanian kings).

The first son of the mythical *Thrita* was *Urvákhshaya*, whose name denotes the wide-ruling or wide-protecting one. He is said in the Yaçna to be pious, and an extender of justice; and in the Afrín Zertusht it is said—"Be beneficent and open-hearted like *Urvákhshaya*." Though no further particulars are given as to his nature, this is sufficient to point out the idea connected with him; and we shall, I believe, hardly err in regarding *Urvákhshaya* as the symbolical image of man's eternal power, and the beneficial effects of time in soothing sorrows and calming passions—as the image of the kindly feelings of man, that incline him to be just and benevolent to those around him. That is the reason why *Urvákhshaya* is represented as a scion of the soothing family of *Sáma*, and a son of the healing *Thrita*, because he relieves the diseases of the mind, as his father those of the body. He is mortal, because his function terminates with the life of man; there being in yonder world neither grief nor passion, neither malevolence nor injustice. But here on earth he is wide-ruling or wide-protecting, since every man needs his assistance. Inward action like his, and the quiet, peaceful life, which is its consequence, do not afford much matter for outward report, and hence it is quite natural that *Urvákhshaya* is so seldom mentioned. But a kindly and peaceful character is also exposed to attacks and injuries from others, being often without the power of resist-

* Mahábhārata, iii. 2783.

ing and the wish of avenging them. To this refers another mythos, (to which I shall presently return), in which *Keresáspa*, the brother of *Urvákhshaya* is made to say—"Let me proceed to avenge my brother *Urvákhshaya* ; let me slay *Hitáspa*."

The third person of the family of *Sáma*, *Keresáspa*, appears under a more distinct form. He is young, with a tall body and a manly disposition : he is armed with a spear and a club. Next to Zoroaster he is the strongest of the strong mortals, on account of his courage in meeting dangers. He is a warrior in all his might and strength, and this also is implied in the name *Keresáspa*, which signifies one whose horses are lean, and therefore swifter and more enduring, which is still the case on the plains of Turkistan. But though a warrior, he is not a savage, furious, barbarian, as he belongs to the *soothing* family of *Sáma*, is a son of the *healing Thríta*, and brother of the *pious Urvákhshaya*. His calling and function is, indeed, war ; but he does not pursue war for the sake of war, but only to heal the wounds of discord, to remedy the breaches of peace, and to restore vanished tranquillity ; and the holy prototypes of the good protect his body, the strength of which is required in fulfilling his calling. He must, accordingly, be considered as a symbolical emblem or personification of the brave courage and bodily strength of man, not attacking but in self-defence, though armed and ready for the fight whenever and wherever danger presents itself. With this agrees what is also said in the *Farvardin Yasht* :—"We worship his prototype to avert hostile violence ; and the invading host, to avert the evil man, and the injury caused by the evil." *Keresáspa* is a mortal being, constituting a part of the nature of man : he is the strongest of all mortals, but inferior to Zoroaster, because the combat sustained by the latter, being for the faith and the spiritual life, was of higher import, and consequently required a greater strength than the contests of *Keresáspa* for mortal life and temporal repose. As his calling is war with the living foes of man, his doings were of a clearer and more distinct nature than those of his two kinsmen ; and this seems to be the reason why he alone exclusively is mentioned in the mythic tale as seizing the bright happiness the third time it flies away from *Fima* ; this flight of happiness having evidently a general reference to all the distress and sufferings which have their origin in man himself, and in the injuries of the living around him ; and, indeed, to remedy this, the aid and assistance of the brother and father is as such needed ; but their efforts, being more indoor, of a more concealed nature,—more directed to the internal state of mind, and domestic, homely, life,—are not so much matter of outward

report and renown as those of *Keresúspa*, who, fighting out of doors, strives to restore the disturbed peace.

Many and various being the causes of the disturbance of peace, many tales are found concerning *Keresúspa*. These all relate to his warfare; but being in general very briefly told, and often only lightly touched upon, the import of these mythic tales is darker and less clear than might otherwise have been the case. The description of external circumstances in the mythic tales, as is well known, is taken from actual life, and may, therefore, very well contain a reference to real facts (though now unknown to us), and be adorned with real traits of character, and names devoid of all mythological signification; which additional matter must necessarily first be sifted before we can arrive at the original idea and real essence of the mythic tale. This is particularly likely to be the case with those mythic tales, the subject of which is man himself and his doings. Although there is, therefore, every probability that in the foes subdued by *Keresúspa* we have personifications of the different physical and moral causes that tend to disturb our external peace and tranquillity, it is not yet clear to which of these causes each particular tale alludes, especially when this is but only slightly touched upon, or merely the name of a foe is mentioned. I shall, therefore, at the present confine myself to those mythic tales which contain somewhat more matter than a mere name.

The chief exploit of *Keresúspa*,—being at least the only one mentioned in the *Yaçna*, and the first recorded in the *Zemyád Yasht*,—is his fight with the venomous serpent or adder *Sravara*, (*i. e.* having horns or claws,) “which devours men and horses, on whom the green venom did flow with the thickness of an inch.” The idea of the mythos seems evident, and the adder undoubtedly signifies all the wild beasts, dangerous for the peace and safety of man, whose attacks and injuries often oblige him to take up arms and defend himself. The serpent seems to be expressly named only as being an emblem of all evil, and, as the Bible says, more subtle (consequently more dangerous) than all the beasts of the field. But as to the particulars of this mythic tale, I am still in the dark, nor do I know to what it alludes when it is further said “*Keresúspa* slew the adder, and was cooking it to food in an iron-pot: at noon it began to burn, and hissed, leapt out of the pot, and overturned the water to flow: away turned the valiant *Keresúspa* frightened.”

I have mentioned above the tale about *Hitúspa*, whom *Keresúspa* slew to avenge his brother *Urvákhshaya*. No further particulars are given respecting *Hitúspa*. The very etymology of his name is uncertain; but to conclude from the manner in which he is mentioned, he

must apparently be the representation of the bitterest foe of a pious and peaceful life. His name *may* mean "he with the *pale* horses." Perhaps, then, he might have been intended to represent pale envy and cunning malice, that grieve at the happiness of others, and are only solicitous to disturb it for the sake of their own profit, or even for no purpose at all but that of disturbing it.

Another vanquished foe is *Zaripáshna*, "who rushes forth with extended jaws" to destroy the material world of truth—or purity. The name denotes "he with *golden* heels." May we not, therefore, look upon him as the personification of the '*auri sacra fames*,' the impure spirit of covetous greediness, which cannot find rest or tranquillity in the possession of what it has, but always covets and desires more—even that which can only "by fraud and violence be obtained." He belongs—which meanwhile does not throw further light on the idea of the mythos—to a class of beings called *Gandarbas*, which in India are considered as attendants in the heaven of *Indra*, but in Irán, like *Indra* himself, have become evil beings.

Amongst other foes subdued by *Keresáspa*, but whose names merely are given, without any further description, we find in the *Zemyád Yasht* one *Snávidaka*, "who strikes with his claws." Though the etymology of the name is uncertain, he is clearly painted as a haughty, though impotent spirit, of vain pride and wild ambition, with far roaming desires, who, merely for the sake of his own amusement or gratification, wishes even to turn the whole earth upside down. Thus he is introduced speaking: "I am but feeble; were I powerful enough, I would make the heaven my chariot, and the earth its wheel: I would bring down the holy spirit from his bright mansion on high, and raise up the evil spirit from his dark abode of misery. They should then both together draw my chariot, unless *Keresáspa* kills me." But, the mythos adds, he was slain by the valiant *Keresáspa*.

Keresáspa seems also to have been placed in a friendly connexion with one of the fairies, who elsewhere are represented as evil beings. We read thus in the *Vendidád* (*Farg. i.*) concerning the desert of *Durhaka*, the seventh place created by Ormazd:—"There the evil spirit produced a fairy, whom she crushed, who followed *Keresáspa*." (*Ya upanghajat Keresáspem.*) According to the words of this passage, the subduer of the fairy must have been a fairy herself; but this passage may possibly contain merely an allusion to the nature of *Keresáspa*, at that time of course generally understood. At least the clause is found literally in another passage (in the *Zemyád Yasht*) applied to manly courage, the inseparable companion of a hero, and surely as much required in the combat against the fairies and spirits of darkness.

The doings of *Keresáspa* are of course extended over the whole earth ; on earth, consequently, his native land and his home must be sought for. Therefore, as *Yima* proceeded from the highest summit of the bright mountain of the east ; as *Thraetaona* was born in the remote regions of the sky ;—so *Keresáspa* is connected with the sea of great gulfs, the earth-surrounding ocean, (*Rangha*,) from which place he, like the ocean, might embrace the whole earth.

These natural fables, which I have severally examined,—these mythological representations of the condition and movements of nature and mankind,—assumed, in the course of time, a more sensible, bodily, and human shape ; and thus *Jemshid*, *Feridun*, *Gershásp* merely appear as purely human kings and earthly heroes in the later traditional history of Persia. I shall not, however, enter on this development of these mythic tales and ideas, but seek to unite them in a whole ; for they really combine to compose one idea, being the several parts of one image, under which the ancient Iranians, twenty-five centuries or more ago, tried to represent their views of the earthly happiness and physical welfare of man, of the contending powers of nature contributive to, or destructive of this happiness, and of the combat necessary to secure it and restore it when lost by man's own transgression.

The bright *Yima* dispenses earthly happiness, which reigns, as long as he is free from guilt, abundantly and undisturbed on earth amongst all creatures, but vanishes on his transgression, he having no power to retain or restore it. The light of day is chased by the gloomy darkness of night, but the kind lord of light seizes the flying happiness. Nature loses its bright and cheerful appearance,—the face of heaven becomes covered with black, threatening clouds,—dark and inclement seasons suspend and destroy the kindly gifts of nature. Then *Thraetaona* is born in the extreme regions of the sky : in the very quarter whence the misfortune proceeds, he combats and dissipates these impediments of nature and the firmament—the combat against these being his office and vocation. Hinderance to happiness further arises in man himself, and is occasioned by him, but this the family of *Sáma* seeks to remove. When sickness attacks the human body, and destroys the enjoyment of life, *Thrita* appears with his healing influences. When sorrow oppresses the hearth, and passion rages in the breast,—when they spread gloom over the mind, and disturb its peace,—the calming, tranquillising *Urvákhshaya* hastens to its assistance, and he restores the peace of mind, and, like his father, enables man again to enjoy the blessings of life with pleasure and cheerfulness. In the hour of danger, when the malice, avarice, or enmity of others threaten to disturb the temporal peace of man, and wild beasts endanger

his safety, then *Keresáspa* steps forth, armed and ready for the fight : he valiantly subdues the foes, avenges the offences, and removes every danger. In short, *Yima* diffuses earthly happiness ; and the other beings combat and remove, according to their several offices, the obstacles which stand in the way of happiness ; and, with the exception of *Mithra*, the lord of light, they are all mortal : their activity, being confined to this perishable world only, must terminate with that with which it is connected—when their assistance is no more required, they can no more exist.

Here the *Zemyád Yasht* closes its allegory of the happiness of man on earth, of its interruption and cessation, and of the combat necessary to restore it. But the allegory is not complete. Even when earthly happiness beams in all its splendour and abundance ; even when man, in full vigour of body and tranquillity of mind, is able without disturbance to enjoy the rich blessings of life : even then his happiness is not complete—something is wanting still ; and that the ancient inhabitants of Irán did well perceive,—that, namely, which *Yima* was unable to confer on man,—knowledge of God and his holy word. The *Haoma Yasht* (included in the *Yaçna*, chaps. ix. x.) completes the allegory. This *Yasht* first mentions *Yima*, the dispenser of earthly happiness ; then *Thraetaona* and the family of *Sáma*, who remove the obstacles to this happiness ; and lastly, in the fourth place, it speaks of *Zoroaster*, whom Ormazd had given to complete the happiness of man, by bringing to him that knowledge he was still wanting. *Zoroaster* is mentioned last ; not, however, because this subject appeared light or unimportant to the ancient Iranians : on the contrary, it was also in their estimation the highest and most important of all ; and therefore they believed *Zoroaster* to be the most victorious and vigorous of all mortal beings, and they believed it to have been the first and chief desire of Ormazd, in his love to man, to bestow upon him this knowledge, and the happiness unattainable by any other means. But the Iranians likewise perceived that the worldly man, absorbed in or ensnared by worldly enjoyment, is but too apt in his happiness to forget his Creator, (and this view is indicated by *Yima* feeling himself incapable to be the bearer of the faith,) and they saw how often distress and trouble were the only means to force the man to turn his mind to God. This is no doubt the reason why *Zoroaster* is mentioned last : he is, however, of a different nature from the other beings I have mentioned, and is only connected with them in as far as he serves to complete the allegory I have been trying to explain.

There is yet one mythic tale concerning *Yima* which does not, however, belong to the allegorical image and ideas of earthly bliss

treated of above, and which I shall here merely touch upon, being at present not prepared to trace out the whole extent of the ideas which apparently are indicated in this mythic tale. This occupied the latter half of the second fargard of the Vendidad, following immediately after the mythic tale, mentioned above, concerning the doings of *Yima*, in the way of extending and fertilising the earth; but the introductory lines of this tale, forming the point of connexion with the preceding one, are unfortunately come down to us in a very defective and consequently obscure state, from which we may meanwhile gather that the period of the tale was thought to be subsequent to the millennium of *Yima*. The contents of the mythic tale are briefly as follows:—Ormazd meets with the holy spirits, and *Yima* with the best of the mortals; both renowned in the Arian land of the source of the good *Dáitya*—*Airyéñé vaéjahi vanghuyáo Dáityayáo*. (*Dáitya* is the name of a river, I suppose the Oxus.) Ormazd then reveals to *Yima* that all countries throughout the whole material world are to suffer from severe freezing winters, and afterwards from sudden thaws, inundations, and heavy rains. As Ormazd commands, *Yima* then plants a square garden, enclosed by a fence; he conveys thither germs of living beings, (“of small and large cattle, men, dogs, and birds,”) and of the red shining flames; he adapts the garden for an abode for man and pasture for cattle, and causes the water to flow abundantly; he conveys thither the largest, best, and most excellent *germs* of men and women, and of every kind of cattle, the largest and most fragrant germs of all trees, and the best flavoured germs of meats; this was done by pairs, and not to perish as long as man remained in the garden. There was no slander nor reproach, no strife nor enmity, neither arrogance, deceit, wretchedness, nor insidiousness; there was not to be found any deformity of body, nor any of the evil marks with which *Ahriman* does mark the man. A further description follows, concerning the arrangement of the garden, and the distribution of the human beings, which description is very obscure, and not altogether intelligible to me. Although this mythic tale is given at great length and with detailed description, it is nevertheless not clearly stated where the place of the garden was supposed to be situated—either on earth or in heaven. Is the garden to be found on earth, and in this present state of the earth? But the life in the garden is far different from the earthly one. The light shines there continually—the sun, moon, and stars appearing together; a year here is there but one day; after forty years (not as else forty weeks) one pair, son and daughter, is born of two human beings; and thus, likewise, amongst all kinds of animals, man does live there the happiest life. Besides, it is not *Zoroaster* who teaches there the faith of

Mazdâ, but another (the name of whom is somewhat dubious, as the spelling of the manuscripts differs in this the only passage where it occurs : he is at least certainly no *bird* at all). Besides, *Zoroaster* is considered to be everywhere else the chief spiritual lord and teacher (𐬀𐬎𐬎𐬎); but although he exercises likewise these functions in the garden of *Yima*, he is not alone in the office, but only second to *Urvaat-nara*, who in the two other places where he is mentioned in the Farvardin Yasht is called the *later born*, the Zoroastrian, or son of *Zoroaster*. Or were it believed that the garden was placed in yonder world, does it give an image of the felicity of the just in the life beyond death? But the souls of the just are conveyed elsewhere, beyond the lofty *Hara*, to the immortal world, where Ormazd and his holy spirits dwell. (*Vendidâd*, Fargard xix.) The souls of the just themselves come thither, and not the best germs, whence *material* beings may be developed; beside, they no doubt carry along with them the faith, by means of which they go thither, and they do scarcely in yonder world require a new prophet, especially as Ormazd himself is the teacher and master (𐬀𐬎𐬎𐬎) of the whole spiritual world. (*Vespered*, k. ii.) Either of these two suppositions respecting the situation of the garden seems equally opposed to what is elsewhere expressly stated. But taking the actual words of the mythic tale, the import of which is that *Yima* carried to the garden the best *germs* of men and beasts, (and not the creatures themselves,) and that life there is for the most part of an earthly nature, (for living beings are born there,) though in a purer and superior shape, it appears to me that the thought leads to the idea, so finely developed in our Scandinavian mythology, of the *renewal* of the earth in a far better and nobler form after the destruction of this present one, and of the ancient divinities. A similar idea appears to be the foundation of this mythic tale about the garden of *Yima*: it seems to refer to a notion of a future and better state of earth, in which more perfect beings will sprout up from the best germs, preserved thither from this state of earth, and in which *Yima* will reign, as on the present earth, as a symbol of material happiness (for he is not even there to be the bearer of the faith), but in which, being undisturbed by earthly impediments, he will not, as at present, require the aid and assistance of other beings similar to *Thraetaona*, and the family of *Sâma*.

This is what I have read and found in the ancient tales of the *Zendâ-vesta*; and I am sure that you at least will read this sketch without being tired, and with the same good feeling and benevolence towards me of which I have already received so many proofs.

ART. V.—*Brief Notices of Persian, and of the Language called Zend.* By JOHN ROMER, Esq., M.R.A.S., formerly President of the Society. Communicated by the Rev. Dr. WILSON, Honorary President.

Presented, January 20th, 1853.

[*Extract from the Proceedings of the Society, 20th January, 1853.*

Dr. Wilson, in directing attention to this paper, which had been forwarded to him for presentation to the Society by Mr. Romer, formerly President of the Society, remarked, that the languages connected with Irán, genuine and spurious, to which attention of late years had been directed, are the *Zend*, in which the books esteemed sacred by the Pársís are found, and which by some, though not by our best British linguists, had long been held to be the parent of the modern Persian; the language in which the Achæmenian inscriptions at Beistan and other places are composed, which is now correctly denominated by the German philologists the *Old Persian*, and of which the *Zend* is undoubtedly not the parent, though it is in some respects cognate; the *Sasanidan*, in which the inscriptions at Hájlábád, (which would presently form the subject of conversation,) and some similar inscriptions of the dynasty of Sasan, translated by the Baron de Sacy, are specimens; the *Pehlivi*, in which translations of the *Zend* writings and a few other works are found in the hands of the Pársís, and which is held by Westergaard to be only a dialectic form of the Persian, misread by the Pársís, in consequence of the use of an imperfect and ambiguous alphabet, and which is denominated by Spiegel the *Pársí*, and said by him to be intermediate between the language of the Sasanidan inscriptions and that of the *Sháh-Námah* of Firdausi; the *Asmáni Zabán* of the *Dasátír*, now admitted by all to be a fabrication; and the *Persian*, properly so called, in which all the works of Irán since the days of Firdausi appear.

Respecting the last mentioned language, Mr. Romer maintains that its connections with the other languages, with the exception of the so called *Pehlivi*, which appears substantially identical with it, notwithstanding the assertion of certain of the Pársís to the contrary, are exceedingly remote and insignificant, and by no means of the character long alleged by some of the able and zealous Orientalists of the Continent. The claims to genuineness urged in behalf of the *Zend* he (Mr. Romer) disputes, as resting on insufficient grounds, particularly as no vestiges of it as a language ever spoken can be found; its historical connections cannot be traced; its structure and form are entirely diverse from the Persian, especially in its having inflexions, while the Persian has none; its literature is frivolous and absurd in its character; and its undoubted relations to the Sanskrit seem artificial and suspicious. He calls upon Dr. Wilson to "undertake the task of a careful re-exami-

nation of the points which have satisfied him as to the genuineness of the Zend," particularly as he has renounced all faith in the authenticity of the Pehlivi as a distinct language, by giving in his adherence to the views of Westergaard.

Dr. Wilson also stated, that though his views of the Zend remain unchanged, and are founded, not only on the analogies which it bears to most of the languages of the Indo-Germanic family, both near and remote, but also on various, though brief, geographical and historical allusions which it contains, and on certain analogies, and at the same time antagonisms, to the oldest forms of Hinduism which it expresses, yet the request of one so much venerated in Bombay as Mr. Romer, and who conducts his discussions with a happy union of spirit and courtesy, had been received by him with the greatest respect. He concluded by moving that the Society express the high gratification with which they have received Mr. Romer's communication, and resolve to insert it in the Journal of the Society. Dr. Wilson's motion having been seconded by A. Malet, Esq., *Vice-President*, was unanimously adopted.]

THE lieutenants of the Caliph Omar but too faithfully obeyed their master's command to destroy all the books found in Persia, so that, in no long time after the conquest of the country by the Arabs in the middle of the seventh century, the whole body of Persian literature had disappeared; and the execution of this barbarian order was so complete, that three hundred years afterwards, when Firdausi wrote his immortal poem, one or two works, only, relating to former times, were found, from which, and from tradition, is derived, it is said, much of the historical lore, real or imaginary, so beautifully wrought out in the "Sháh-Námah."* By the modern Pársís, however, whose notions of history may be judged by the fact, this devastation of the learning and religious books of their ancestors is attributed to Alexander.†

But although both religion and empire fell before the conquering arms of the Musalmans, and although a comparatively very small number of the people ultimately remained true to the ancient faith, the original structure of the Persian language was not thereby affected in the smallest degree. Firdausi wrote in this language, employing occasionally ‡ a word from the Arabic, which had then begun to be introduced into Persian, without in any way altering the grammatical

* Moses of Chorone, as appears in his *History of Armenia*, written five hundred years before Firdausi, was acquainted with what he designated the fables of Persia, and among them quotes the story of Zohak and his two serpents.—*Bom. Lit. Trans.* vol. ii. p. 152.

† [This is done in many works of the Pársís, both in print and MS. Yet, with as much absurdity on the other hand, it is alleged in the *Dasátir* that Alexander himself became a convert to Zoroastrianism!—J. W.]

‡ Kennedy, taking part of the text, found, in passages of one thousand couplets each—in the first thousand, fifty-four Arabic words; in the second, thirty; and in the third, forty-six: not quite five words to each hundred verses.

form of that ancient tongue ; indeed, to have done so must have effected a radical change, for in genius, character, and grammatical structure no two languages can be more dissimilar ; and hence, as no relics of the old literature of Persia survive, we cannot ascend higher than to the works of Firdausi, Rudakí, Kháqání, and some others, for a knowledge of the written language of Persia, nine hundred years ago. Yet the state in which this language then existed, and still exists, regular, copious, and esteemed by Muhammad for its " extreme sweetness," exhibits qualities which approximate, as near as human speech can be supposed to reach, a formation all but indestructible. There are, therefore, no grounds for assuming that it was spoken under this or that dynasty ; all that is known with certainty is that the Persian language dates from remote antiquity, and that, with other languages, which he mentions, is, according to Kennedy, " in exactly the same state at the present day as it was three thousand years ago."

Turning to the opinions of other Orientalists, we find Kennedy's position, of Persian being a distinct tongue without affinities, met by a belief that there exists between Sanskrit and Persian " the consanguinity of sisters," a common progenitor being imagined ; and that although at present not apparent, there was a time when Persian possessed inflexions. Both these hypotheses are rejected by Kennedy, *1st*, from the absolute dissimilarity of the two languages in grammatical structure, and *2ndly* that nothing more conclusive than conjecture is producible as to the time when, and cause why, the Persian underwent the loss of its inflexions. In support, however, of the first opinion, the language of one of the Behistun inscriptions is adduced, as showing that inflexions appear in what is certainly the ancient portion itself.

But, receiving as incontestable Kennedy's statement, " that not the slightest indication exists, either in tradition or history, which shows that previous to the Arabian conquest any foreign influence operated the slightest change on the Persian language," I can discover nothing indicating even the probability of the Persian first possessing and then losing its inflexions. The argument on this point, which might be founded on an examination of the Behistun inscriptions, would deserve all attention, could we feel assured that the Zend there inscribed was in the vernacular and spoken language of Persia in the time of Darius Hystaspes. But, as Grötelfund observes, from the cuneiform characters being distinguished by the total absence of curves, it would seem to be destined to be cut on stone, or some solid material, for inscriptions, monuments, &c. as a sacred lapidary writing, never in

common use, the inference may be admitted that the "petrographic" writings at Behistun, consecrated to recording the glories of the monarch's reign, are not written in the common language of the people.

On this Colonel Rawlinson observes :—" It is certain that the language of the inscriptions is not a derivation from the Zend : the two forms of speech may possibly have existed synchronously, one as a demotic, and the other as a hieratical language ; but in that case the disfigurement of historical names, and the striving after artificial etymologies, which occur in every page of the Zendávasta, are points which will hardly admit of explanation." The Colonel just before had stated his inability to subscribe to the opinion of Burnouf, that " the Zend was immediately cognate with the Vedic Sanskrit," or that it was ever a spoken language. (Jl. As. Soc. Part i. vol. x. note, p. 51.)

At page 13 of the above, Colonel Rawlinson remarks :—" It must be remembered that the Persian of the ante-Alexandrian ages has long ceased to be a living language" ; and at page 50 he speaks of " the change the Persian language was gradually undergoing as it came into more general and vernacular use. As the tendency, indeed, of its popular employment, must have necessarily been to emancipate it from the technicalities of nice grammatical propriety under which it appears in its earliest form, and for which it was, no doubt, indebted to careful written cultivation, I should be inclined to assign the period of Alexander's conquest as the probable era from which we may date its bifurcation into the two distinct channels that it would appear to have subsequently pursued. I would suppose, that on the one hand as an oral dialect it lost its compounds, and many of its distinctive articulations, its redundant relatives, its inflexions of case and gender ; and that it thus gradually subsided into the vernacular form which it possessed, probably, on the institution of the Sassanian monarchy, and which continued with little variation to the Arabian conquest. On the other hand, also, I would conjecture, that whilst it was still in the enjoyment of much of its original vigour and flexibility, it was taken up by the priesthood as a vehicle for religious teaching ; that it was modified and augmented by further intercourse with its cognate branches to the eastward ; and that, as a general dialect, it was refined and systematized by sacerdotal care, until it became finally embodied in the highly artificial forms of alphabetical expression, and of grammatical structure, which we find it to exhibit at the present day in the Hagiographic books of the Pársís." These opinions will be examined in the sequel.

Notwithstanding the entire destruction of ancient Persian literature,

and a destiny quite the opposite of that of the "most copious, the most expressive, and the most harmonious of languages," the Greek, which for the space of two thousand five hundred years—to the capture of Constantinople—remained the same language, a singular fact occurs in the history of the last, strongly contrasting its fate with that of Persian. A late writer,* in his examination of the character of ancient and modern Greek, describes in full the process of degradation which the Hellenic language has undergone in its transformation into Romaic. Now, on Persian no such degradation or transformation has attended: it continues, to this day, as it has always been, in the country in which it was first spoken, the living tongue above described, the unchanged vehicle of speech and thought of successive powerful peoples.

Proceeding, then, to the principal object of this paper,—an examination of the asserted authenticity of the language called Zend,—we find a writer in a late number of the *Edinburgh Review* speaking of it in these terms:—"The language of the *Zendávesta*, most intimately connected with the language of the *Veda*, the inscriptions of Cyrus, Darius, and Xerxes, and the Pazend or Persian spoken under the Sassanian dynasty, the grand epic of Firdausi, and the language now spoken in the country, exhibit a complete biography of the Persian tongue." But, passing over the blunder of making Pazend "pure Persian" spoken under the Sassanian or any other dynasty, when, as the name itself implies, it is nothing more than the language, Persian or other, written in explanatory fashion *below* the Zend text, it may be inquired on what authority, or with what reason, does the reviewer place the *Zendávesta* at the top of his biographical sketch of the language of Persia. It was Sir William Jones who first observed the number of Sanskrit words found in Zend, and the grammatical relations subsisting between them. All our knowledge of Zend is derived from, and confined to, the contents of four or five books produced by the Pársis, and by them affirmed to be the writings of their prophet Zerdusht or Zoroaster. These manuscripts are of no antiquity; perhaps some copies may be found written between three and four hundred years ago.† Their subject is the exhibition, together with an

* Finlay's History of Greece.

† [The oldest Zend MS. of the *Vendidád* now in the possession of the Pársis of India bears the date A. Y. 967 (A. D. 1617). It was written in Persia. A portion of the *Vendidád*, however, sold by them to Professor Rask, and now in the Royal Library at Copenhagen, bears the date of A. Y. 673 (A. D. 1303), which Professor Westergaard considers genuine. A fragment of the same MS., or of another of

absurd cosmogony, of the doctrines, rules, and observances of a polytheistical worship, devoid of all worth or regard as of pretended institutions, divine or human, so amply exposed by Dr. Wilson in his work on "The Pársí Religion."

The opinions of Sir William Jones and Richardson, adverse to the acknowledgment of the Zend to a place among genuine languages, are well known, and have met the full concurrence of that sound and able philologist, the late General Vans Kennedy, who states:—"But the sole authority on which the Zend and Pehlivi books depend is the traditions of the Pársís. Before, however, these traditions can be admitted as testimony, it must be satisfactorily proved that the *Zendávasta* and its Pehlivi translation actually existed at the time of the Arabian conquest, and that they have been carefully preserved until the present day by the Pársís of Persia and India. But no such proof has ever been adduced, nor has it been yet established, that the Pársís of either country possess any well-authenticated traditions, which ascend uninterruptedly up to that event. On the contrary, the silence of Tabari and Firdausi respecting them is a strong presumption that they were not invented at the time when these writers lived." Colonel Rawlinson, however, in a memorandum, written at Bombay, in 1840,† takes a totally opposite view of the Zend, and thus expresses his opinion:—"It has been asserted by some of our most distinguished British Orientalists, that the language in which the sacred writings of the Pársís is composed is a fabrication of the Zoroastrian priests, subsequent to their expatriation from Persia; and that these writings, in consequence, are, as far as regards antiquity, entitled to no consideration whatever. Against this assertion I offer the following remark: in various parts of Persia are to be found, at the present day, inscriptions in a character which we denominate cuneiform, exhibiting historical records of the sixth and fifth centuries before Christ, written in three different languages." "To the analysis of these characters, and the examination of this language, I have devoted many years of research; and I can now safely assert, that the Persian language of the ages of Cyrus and Darius is unquestionably the parent

the same time and place (Cambay), is in London. A copy of the *Yaçna*, also from Cambay, and now at Copenhagen, was written A. Y. 602 (A. D. 1322). The other Zend MSS. at Copenhagen, Paris, London, Oxford, and in my own collection in Bombay, with the exception of a single fragment, perhaps, are of posterior dates.—J. W.]

* *Researches*, &c. p. 168.

† Wilson on the Pársí Religion, p. 402.

of that tongue which we call the Zend, and which has been so successfully elaborated by Continental students, and by none with greater skill and perspicuity than Mons. Burnouf, in his admirable '*Commentaire sur l'Yaçna.*' I am merely desirous, on the grounds I have mentioned, to record my conviction that the Pársí writings were imported from Persia, in their present state, during the seventh century of Christ, and are thus entitled to the same degree of consideration among the Pársís of the present day which they enjoyed among their ancestors at the period of expatriation."

Dr. Wilson observes :*—" Whether or not the Pársí priests in India, from their traditional reminiscences of the ancient languages, could have fabricated some of the Zend writings, I shall not positively assert. There is a poverty of expression in some of these writings, particularly of the minor liturgical pieces, which shows that their authors had no ready command of the language in which they wrote. There is an approach to Gujarátí idiom in some instances, and to a Gujarátí corruption of Sanskrit, which at one time awakened considerable suspicions in my mind. Viewing the matter of the Zend language, however, in its general aspect, I have no hesitation in declaring that none of the exiled and depressed Pársí priests in India can be supposed to have had the ability to invent that language,† with its extensive grammatical forms, and with its abundant and regular analogies to the Sanskrit, Persian, Latin, and Germanic languages, as so distinctly evinced by Bopp and Burnouf."

It is to be regretted that Dr. Wilson, remembering Kennedy's filiation of certain languages from Babylonian or Sanskrit, to the exclusion of Persian, did not abide by and work out his earliest impressions as to whence the fabricators of Zend drew the materials for their work. But as he has relinquished faith in the authenticity of Pehlivi, as will appear presently, he may possibly undertake the task of a careful re-examination of the points which have satisfied him as to the genuineness of Zend.

The works of Professor Bopp and M. Burnouf are to be regarded with great respect for the erudition, labour, and research, and yet more especially for the abounding imagination and rare ingenuity, they exhibit. But they may, without presumption, be asked, what facts in the history of the Zend, elucidatory of its existence as a real language, has the employment of so much time and industry discovered? Colo-

* Pársí Religion, p. 400.

† The Pársís of India were not entirely unlearned, for we know that three centuries ago they had translated the Pehlivi version of the Vendidad into Sanskrit.

nel Rawlinson, as has been seen, inverts the order of succession attributed to the languages of Persia by Anquetil du Perron. This point is not noticed by Bopp or Burnouf; but it would have been information of real value had these learned persons been able to show, from some authentic record, the time when, the country where, and the people by whom, the Zend was spoken and written;—for such knowledge we look in vain.

The conclusion arrived at from a fair examination of these premises appears to be, that the language of the Zendávasta is pure invention, wanting in all the essentials of vitality. There is no proof, and the mode of its composition, entirely artificial, contradicts the idea, of its ever having been found as the interpreter of thought or volition in the mouth of man, woman, or child;—a sort of galvanic existence only may be perceived in it, produced by a not unskilful adaptation of the flexible powers of Sanskrit grammar in working up materials supplied from that language. In Anquetil's Vocabulary, further, may be found the following seven Zend words, belonging to the dialect of Gujarát, viz:—“*Bee*, deux; *toum*, tu; *zeante* (janto), *connaissant*; *gnato* (nahato), *lavant*; *te*, toi; *kerete* (karto), *faisant*; *petche*, *derrière*. Also the signs of the genitive case in Gujarátí, *no*, *ne*, are sometimes affixed, as in the (appropriated) Turkish word *aspereno*, observer. (Researches, p. 172.) Comparative philology, like comparative anatomy, may have all the value claimed for it, provided care be taken that it operates upon real subjects, and not on counterfeits. These essentials must not be taken for granted. The forgeries of the writer of the “*Asmáni Zabán*,” of the “*Dasátír*,” and of the language of *Formosa*,* by G. Salmanazor, are instances of what may be done by unscrupulous and bold invention. But Mullá Firuz, shutting his eyes to the clumsy forgery, affects to believe the language of the *Asmáni Zabán* to be genuine, and professes to have such a knowledge of it as enabled him to correct mistakes of the transcriber, and to supply omissions in the translation. He says (*Dasátír*, vol. ii. p. 16):—“Wherefore this humble Firuz, according to the best of his poor understanding, has rendered the translation conformable to the text, and inserted it above.” The learned Mullá, also, thought that his copy of the book was the only one extant. It was not. Other copies were subsequently discovered: one found at Surat was sent to the Bombay Literary Society.

Sir William Jones never saw the *Dasátír*. He only knew the book

* Historical and Geographical Description of *Formosa*. London: 1704.

from what he found concerning it in the "Dabistán." This accounts for the erroneous estimation in which it was held by him. The Dabistán itself was quite unworthy of the praise he lavished upon it; for of these mistakes in judgment the late Mr. Erskine truly observes:—"The history of letters seems to me scarcely to afford an instance of a more perverted judgment on historical evidence." But, on the other hand, how Mr. Duncan, with his natural sagacity and cultivated intellect, could take the Dasátír for a treasury of Oriental literature, undertake a translation of it, and "intend, on his return to England, to present it to His Majesty as the most valuable tribute which he could bring from the East," (Bom. Lit. Trans. pp. 342, 349,) has always appeared to me most incomprehensible.

Professor Lassen, it is said, is engaged in preparing a grammar of the Zend; a work, should he undertake it, of no great difficulty to a Sanskrit scholar so profoundly versed in the language as he is. The learned Professor has only to apply the rules of the Vyákaran to his purpose, when the Zendo-Sanskrit words will readily submit to the process required, through moods, tenses, and inflections. Yet this, if ever so successfully performed, will afford no proof of the authenticity of the Zend, because by a similar operation, applying the rules of Persian grammar, a grammar of the notoriously fictitious language of the Dasátír may be as easily produced.

The examination of another language most intimately connected with the Zend now naturally follows: this is the Pehlivi. The Zend text of the Vendidad, and its translation, as it is called, into Pehlivi, are in all probability cotemporaneous; that is, they were composed (*invented*) about the same time, and are held in equal reverence by the Pársís. Hitherto the opinions of English Orientalists adverse to the authenticity of this language have not been deemed valid by the Oriental scholars of the Continent. Professor Westergaard, however, has lately seen reason to take a different view of the question, and expresses his latest opinion on the subject to Dr. Wilson, of Bombay, to the following effect—"That on a critical examination of the so-called Pehlivi writings, he found them not to be in any Sassanian language, but merely in a dialect (probably the Kirmanian) of the modern Persian, disguised by the use of an imperfect alphabet, often now misread by the Pársís, the Shemitic words introduced into it being merely corrupted Arabic." With this opinion Dr. Wilson entirely agrees.*

I would here introduce a word or two regarding *unfabricated Pehlivi*;

* [Mullá Rustamjí informs me that his learned uncle, the late Mullá Firuz, had come pretty much to the same opinion.—J. W.]

and observe, that before assigning any precise signification to them, we should ascertain by whom, in what manner, and to what language the genuine *Pehlivi*, also named *Pársí*, was originally, in these terms, applied. This may be easily done ; and it is necessary, for a distinction which has no existence has been assumed. Dr. Spiegel is said to consider the *Pársí* to be the language of Persia *between* the genuine *Pehlivi* of the Sassanians and the Persian of the *Sháh-Námah*. On examination, this opinion will be found quite inadmissible. Let us ascend to the earliest authority by whom the words “ *Pehlivi* ” and “ *Pársí* ” were, certainly, first used, *Firdausi*, and we discover at once their true meaning and acceptation, now obscured by modern theories. His testimony plainly establishes the fact, that instead of distinctions and modifications existing between Sassanian *Pehlivi* and the Persian of the *Sháh-Námah*, they are absolutely identical ; and the language named by *Firdausi* indifferently “ *Pehlivi* ” and “ *Pársí* ” is precisely that in which his poem is written—for he says :

“ *Bipardákhtan daftar-i-Pehlavi.* ”

* * * *

“ *Ajam zinda kardam be in Pársí.* ”

And thus, unless we deny the author the power and right to inform his readers in what language he writes, his evidence is conclusive, and the question determined.*

About the time these circumstances became known to the writer of these Notices, an opportunity of communicating with Professor Lassen occurred. The learned Professor had sent to the Asiatic Society a portion of the text (the first five chapters) of the *Vendidád*, then just published by him. Finding that the *Pehlivi* translation was not given with the text, or noticed in an accompanying short preface, the writer offered for the acceptance of Professor Lassen some extracts he possessed of the book, which contained, with the *Zend* text, a *Pehlivi* translation ; forwarding with these papers three letters, which under the signature of “ *Kámgar*,” had appeared in *Allen's Indian Mail*. He also, in the letter addressed to Professor Lassen on the occasion, referred to the opinion of Professor Westergaard, as detailed above, sending for this purpose the transcript of a few lines he had written to Dr. Wilson on the subject.

Professor Lassen, in a courteous answer, expressed his regret at not being able to subscribe to the writer's views of the *Zend* language, “ which he considers to be a genuine one, chiefly on two grounds :

* Abridged from *Researches*, pp. 165, 166.

first, that it agrees so intimately in its system of consonants with the ancient Persian, that it must be considered to have been a sister-language, chiefly distinguished by its vowel system, which exhibits several distinct traces of a modern state. And that it would, in the second place, be necessary to suppose, if the Zend language was fictitious, that the Pársis possessed a knowledge of comparative grammar, the Zend being rich in Indo-Germanic analogies."

To this it was replied, that putting the Zend and Persian, without adverting to some common progenitor, in the relationship of sisters, was new and worthy of consideration, taken in connection with the other distinct opinions on the question, those of Anquetil du Perron, of Colonel Rawlinson, of Sir W. Jones, and other English Orientalists. That it was far from clear how the agreement of the Zend in its consonantal system with that of the Persian was proof of the relationship assigned to them. The same alliance might be said to exist between the Persian and the "Asmáni Zabán," for both use the same alphabet, and the letters have the same powers. And further it was remarked, there could be no doubt, that for some time after the Arabian conquest the Persian language continued to be written in its ancient indigenous character,* (eventually superseded by the modern Arabic alphabet, itself an off-shoot of Syriac,) the same character which is now employed in writing Zend, and is sometimes used for writing Persian at the present day. But above all, it was observed, that as the vowel system of the ancient Persian character was identical with that of the Sanskrit,† it must have lent its aid, in no small degree, to facilitate the presumed composition of the Zend.‡

It has been said that analogy exists, in regard to the loss of inflexions, between the English language and Persian. I have not been able to discover this, but rather the reverse. From, we will say, the age of

* A perfect system of letters ought to contain one specific symbol for every sound used in pronouncing the language to which they belonged. In this respect the *Old Persian* or *Zend* approaches to perfection.—*Sir William Jones*.

† There are also some Sanskrit aspirates under arbitrary forms of letters, unknown to the ancient Persian alphabet, and this shows the attention paid to using Sanskrit with effect.

‡ In regard to *analogies*, It might have been added, that the attempt to identify the Bengali word *bohini* with the Sanskrit word *wasri*, by the permutation and excision of letters, shows how far a philologist may be misled who misapplies his rules, and permits fancy to supersede judgment.—*Edinburgh Review*, October 1851.

[The Bengali *bohini* is obviously derived from the Sanskrit *bhagini*, a sister. The word *wasri* has its correspondents in the German *schwester* and English *sister*.—*J. W.*]

Alfred to that of Shakspeare, an interval of about seven hundred years, the rude Anglo-Saxon, gradually dropping most of its inflexions, and adopting foreign words to an unlimited extent, has become in the process of time the copious, expressive, polished, and flexible English in use. But the speech of Persia, we are sure, for the last thousand years, has remained the same perfect tongue, unaltered in its grammatical structure, we read in the Sháh-Námah. And judging from proper names found under Greek forms in the historians of Alexander, such as "Parysatis," for "Parí-zádah," fairy-born; "Roxana" for "Raushanak," little splendour; and others, there appears no reason to doubt that the Persian of that day was the same tongue in which Firdausí wrote. The use of the diminutive *k* in "Raushanak," as the same letter, with similar effect, is employed in "Mardak₂," manikin. "Pesarak," little boy, in modern Persian, affords a pregnant instance of their identity.

In the sequel, Professor Lassen mentioned, that, having no accurate knowledge of Pehlivi, he declined offering any opinion on Professor Westergaard's views of it. This is unfortunate, for M. Burnouf considers the Pehlivi translation to be an indispensable adjunct to the Zend text, but if ultimately considered as spurious, Zend must run the risk of undergoing the same fate, unless some adequate cause can be found or imagined for joining a fabricated translation to a true text, and acknowledging both with equal religious respect.

M. Burnouf (Preface l'Yaçna, p. xxiii.) says, "*On peut donc regarder comme un fait certain, quoiqu'il manque à cette assertion la preuve la plus décisive, c'est à dire la comparaison du texte Pehloie lui-même avec la traduction Sanskrite, que la travail du Neriosengh est une copie fort exacte de la version Pehloie, qui existait, il y a trois siècles dans la Guzarate.*"

This then is the country, there remains little doubt, where, in communication with their co-religionists of Kirman, with whom a most intimate intercourse has always been maintained, both languages were invented by the Pársis of India.

Resuming, as proposed, a further consideration of Colonel Rawlinson's opinion, we find two hypotheses brought forward—1st, that ancient Persian once possessed, and afterwards lost its inflexions. In answer to this it will be sufficient to repeat, as has already been shown, that conjecture is substituted to establish facts which, if in existence, might be easily exhibited. For the 2nd, I place the proposition and reply together, and say that to reply that the poor, rugged, and unspoken language, the Zend of the Vendidad, was derived from the Persian of any age, and through a process of "sacerdotal care" and refinement so

circumstantially described, arrived at the perfection of language claimed for it, seems to me so inconsistent with safe conclusions from premises ascertained, and to present such a fancy picture, differing *toto celo* from the true character of the language in question, that I fairly confess myself at a loss how to deal with these assumptions, and must be content to quote in my defence a Hindustání proverb which thus runs—"Bhárí pathar chorneko chhoro."

Colonel Rawlinson, in continuation, it may be observed, admits that the Zend was not ever a spoken language. Mr. Erskine thought the same; and this being the case, it may, wheresoever *derived*, according to some, or by whomsoever *invented*, according to others, without dispute be taken by both as a *hieratical*, and not a *demotic* language. Dr. Wilson's analysis of the twenty-two "Fargards" or chapters of the Vendidad will afford to any one desirous of acquiring it a full knowledge of the scope and value of the "religious tendency" of that book.

Long ago, when residing among Pársís at Broach and Surat, the question of the authenticity of the Zend engaged my attention. In this, my sole object, at that time and since, has been the development of truth: truth is indestructible, but it does not escape defacement. Should the sequel show that I am mistaken in my conclusions, the triumph of truth will be my sufficient reward.

As I close this paper, I see that the cause of Zend literature is receiving progressive attention. Dr. Spiegel, Professor of Oriental Languages at Erlangen, with others, is thus engaged. The learned Professor has in the press at Vienna an edition of the Zendávasta, consisting of three vols. 8vo., and containing the original text, the Pehlivi version, a copious list of various readings, and a German translation of the whole. [Professor Westergaard at Copenhagen, too, has in the press a critical edition of the whole of the Zend Texts, with an English translation, grammar of the two Zend dialects, a copious concordance and dictionary, dissertations on the Iranian antiquities, etc.]

November, 1852.

NOTE.

A writer in the *Quarterly Review*, No. 113, p. 82, thus expresses his opinion of Kennedy as an author: "General Vans Kennedy, in his elaborate 'Researches,' &c. goes so far as to affirm that the 'British Celtic language has no connection with the languages of the East, either in words, or phrases, or the construction of sentences, or the pronnnciation of letters.' This positive declaration from a man of undoubted information and research might seem decisive of the question. But

when we find that he denied in equally positive terms the affinity between Sanskrit and Persian, which Sir W. Jones and Professor Bopp have made as clear as the noon-day sun, we may be permitted to suspect that in this case he has pronounced his verdict rather hastily." Now on this it may be remarked, that Sir W. Jones, although stating something to this effect, never deliberately maintained such an opinion as is here attributed to him, and that Professor Bopp can only exhibit what truly exists, not what is fancied; while on the contrary Kennedy proves his assertion by a masterly array of facts and lucid reasoning, concluding his argument in these words:—"But these fully prove, that though the Persian is not derived from Sanskrit, still the Persians must have had, at some remote period, a most intimate intercourse with a people who spoke that tongue." * * * "For, if not, it must necessarily follow, that, notwithstanding the numerous Sanskrit words it contains, Persian was not derived from Sanskrit." Having previously (p. 190) said, "This people speaking Sanskrit could be no other than a numerous colony which had migrated from Babylon, on its conquest by the Ninus of Herodotus, part of which established itself in Persia, and part proceeded on to India."—*Researches*, p. 267.

ART. VI.—*A description of the Salt-water lake called the Null, situated on the Isthmus of Kattyawar.* By Major FULJAMES, Bombay Army, Political Agent, Riwa Kanta.

Presented 17th March 1853.

THE Null is a large lake of brackish water 37 miles SW by W. from the city of Ahmedabad, and situated on the western frontier of the Dholka purgunna. It extends over a measured area of 31,500 acres, or $49\frac{1}{2}$ square miles. Of this, 22,796 acres, or $35\frac{1}{2}$ square miles, were actually covered with water at the time its outline was surveyed in February 1824.

In general character it is shallow, rarely exceeding 6 feet, and muddy in those parts which are free of weeds, but quite clear where these abound; thick, nearly impenetrable, masses of bulrushes and high grass surround the western, southern, and northern shores of the lake, for a considerable distance inland; the eastern shore is generally open, and free of rushes. No perceptible bank appears, and the country that borders on it is a dreary, desolate flat, though in some places with a vegetation of the rankest and most unwholesome nature.

On its eastern side there are some very remarkable undulations, which bear a remote similarity to the Mor Puna, or sandy hillocks that skirt the sea-shore between the Tapti and Nurbudda rivers. It is also worthy of remark that those undulations are composed, as far as I have been able to examine, of drift-sand; that they extend at considerable intervals from the eastern side of the Null in a north-westerly and south-easterly direction, as if thrown up by the action of the waves of the sea by a south-west swell. Such sand ridges are to be met with near the western and southern base of Mount Aboo.

From the usual bearing of the ridges, and in the present absence of the sea, it may be inferred that the action of the south-west winds have assisted their formation, as the sea would have done, for these winds must blow during the monsoon with great violence over such an otherwise level country; the soil being in most places a loose, fine,

reddish and whitish sand, easily acted upon by any wind that blows. Between the ridges are extensive bays, having a crust of salt on them, bare of all vegetation; in fact they resemble those bays to be seen along the coast which are inundated by each flood tide. They extend east as far as Jeytapoor, a distance of 8 miles.

Sometimes these sandy undulations run east and west, and there are some remarkable ones in the vicinity of Ahmedabad, lying in this manner. Wherever they have been cut through by the rush of water during the monsoon, their appearance is that of a high bank of fine loose sand, with small nodules of lime, called kunkur, dispersed throughout it. Sometimes a few small Mollusca are seen; for instance, *Planorbis corneus*, *Lymnæa stagnalis*, *Scalaria pretiosa*, and *Solarium*, also a large *Ampullaria globosa*, of which I enclose a drawing.

It is possible some of these undulations may have been formed in the first instance by some upheaving force from below, for we have abundant proof in many parts of the western portions of Guzerat that they have at remote and recent periods been much disturbed by volcanic agency: the former is evident from faults in the sandstone rocks near Ahmednuggur, 60 miles north of Ahmedabad, and from the basaltic dykes which have been forced up through horizontal beds of fine sandstone both in Kattyawar and Cutch; a very good example of which is to be seen at the town of Than, 38 miles north-east of Rajcote. The formation is a reddish compact sandstone, the strata of which appear horizontal. Through these strata, a dyke of columnar basalt has been forced: the dyke is about 8 feet wide, and appears to have been forced vertically, though the columns lie horizontal, like the strata of sandstone; a white calcareous cement appears at the divisions of the columns. The dyke crops out to the surface, and can be traced a considerable distance as forming the bund of the tank at Than. It strikes north and south. The people of Than have turned the dyke to good account in forming wells by extracting the basalt, which from its columnar formation is easily done, and leaving the sandstone on either side untouched. Apparently an abundant supply of good water from the sandstone is procured. The wells to a casual observer appear as if excavated from the sandstone rock, but a close examination shows the way they are made.

Of the more recent effects of volcanic agency the earthquake in the year 1819 is a good example, for it was felt the length and breadth of the province of Guzerat, and has left the most lasting marks of its

mighty power both at Ahmedabad and in Cutch. One of the finest mosques at the former place, called the Jumma Musjid, was much injured, and its stone minarets, which were very remarkable for vibrating on any person ascending to their summit and rocking himself from one side to the other, were hurled to the ground. Many other mosques, though built most substantially of stone, were rent and cracked in all directions.

This earthquake had an extraordinary effect on the springs of water in the wells in many parts of the Ahmedabad Collectorate : in the lands of the villages of Tajpoor, Changodur, Sunathul, Telaow, and others to the south-west of the city, and from 6 to 10 miles distant, previous to the earthquake, brackish water was found from 60 to 70 feet from the surface ; subsequent to the earthquake sweet water was found in the same lands at from 15 to 30 feet from the surface. Similar changes, though with a contrary effect, were observed in the wells of many villages some 30 miles south of the city, particularly at Roopaul and Santhul, in the Dholka purgunna : wells that held sweet water became salt, and totally unfit for any purposes, and remain so to this day.

The object of this digression is to show that the Null may have been formed by this agency either having caused a sinking of the country which the Null now covers, or by having upraised the land it occupies, and which divides Kattyawar from Guzerat. This latter theory I am inclined (after a careful inspection of the country in all directions) to advocate, and will adduce some remarks in support of it.

Immediately north of the Null, and about 20 miles distant, is the present most southern extremity of the smaller Runn. There is, however, a rain water channel, extending many miles from this point in the direction of the Null, and which acts as the natural drain of the country, by carrying off the water into the Little Runn. From the southern extremity of the Null the country is a low, salt flat or plain, very similar in appearance to the Runn itself, over which the superfluous waters of the Null, by passing, have in a series of years excavated the present rivers called the Bogawa and Oonkar, which unite near the village of Dhunala, 20 miles south ; from hence the Bogawa flows in a south-easterly direction, until it joins the Saburmutti river, a few miles above its embouchure into the Gulf of Cambay.

The country on either side of the lake is called by the people the Null Kantha, or Cantha, a definition of which the following extract from Colonel Todd's Western India will explain :—“ *Cantha* is not only the general designation for a coast or margin, but is to this day

especially applied to all the portion of Cutch lying between the hills and the sea ; and the application of the term *Trinus* by Arrian must have been restricted to the fenny portion of the head of the gulf (Colpus) familiarly known as the *Rin* or *Runn*, a corruption of the Sanskrit word *Aranya*, or waste. In like manner the phrase *Erinas* used by the first Arrian must be used to designate the greater *Rin* or *Runn*, which, uniting as it does with the smaller, actually makes Cutch insular."

I believe it is generally admitted that both the larger and smaller Runns were at one time covered with sea water, and they therefore must have been connected with the sea by either the Gulf of Cutch or the Luckput Channel, or, more likely, by both. It is also commonly believed that the depth of water was such as to enable boats to ply from one point to another. By an inspection of the country I am led to believe there was formerly a third direct connection with the sea by the Gulf of Cambay, and along the low salt country leading to the Null, and from thence to the Little Runn. If such was the case, the present Peninsula of Kattyawar would then have been an island, like Cutch.

It will be seen, either by personal examination, or by an inspection of a good map of Kattyawar, that, taking the range of hills near Jusdum and Choteyla as a centre, all the rivers run to every point of the compass : those on the east into the Null and Gulf of Cambay ; those to the north falling into the Little Runn ; those on the south into the sea ; and those on the west into the Gulf of Cutch. It will also be observed that the only streams that exist on the eastern or Dholka side of the Null flow to the west, while those on the Kattyawar side flow east, distinctly showing the dip of the country, and that the Null is even now the lowest part.

It is curious, also, to observe, that from the western side of the Null until you reach the Vindiya range of mountains, on the eastern side of the Myhi river, a distance in a direct line of above 80 miles, there is no river flowing from the west to the east ; one and all flow from the north-east and east to the west and south-west.

That the Gulf of Cambay had a very different outline to what it has at present, and that it extended much further north, is apparent from the formation of the country, from salt-water bushes or trees being constantly seen very long distances inland, and from tracts of country having the barren and saline appearance so remarkable along the shores of the Gulf and in the two Runns ; besides, the water in the wells in such localities being usually salt or brackish.

During the comparatively short time of twenty-three years I have resided in this province, some extraordinary changes have taken place, which it may be interesting to record, if merely for the sake of showing how easily in a soil like that which exists in the localities I am writing about, new rivers or channels are formed; and how easily a body of water, such as we may suppose the Runn to have been, may have been drained off, and its former channels closed up.

In the first instance, I may mention the Bhadur river, which usually flowed past Ranpoor and Dundooka, and formed the creek of the port of Dhollera. In the year 1817, and subsequently in 1833-34, owing to some unknown cause, it left its channel about 4 miles west of Dundooka, and during the latter period cut for itself an entirely new channel, a distance of 15 miles in a north-easterly direction, and united its waters with those of the Null which flow down the Bogawa river, the point of junction being near the village of Huddala.

In 1824 it is mentioned in the survey report that the tides extended as far as Huddala. In January 1850 they extended many miles further up, and during heavy floods the waters from the Null and the surrounding country, which is frequently for many miles in extent under water, must be united; from which cause the brackishness of the water of the Null may be attributed, though, strange to say, this brackishness does not show itself until some months after the cessation of the rain, and a considerable portion of the waters have been reduced by evaporation, and by being absorbed by the earth.

The village of Veckrea is situated on rising ground on the eastern shore of the Null, about half a mile distant. There are a good number of trees around the village. This rising ground affords a person a good view of the lake. The country within view looks bleak and desolate: there are a few trees near the eastern shore, and at one old tree is a place called Hinglaj Arra (ford or crossing). How this name originated I was unable to obtain any very satisfactory information, beyond that formerly it was said there was a temple called Hinglaj Mata* on an island in the Null, and that this was the ford or crossing to it. No remains of this temple are now to be seen, though the direction in which it was supposed to have been situated was pointed out. This was the only tradition of the antiquity of the Null which I could pick up.

I enclose with this paper three sketches of a most primitive kind of boat in general use on the Null, drawn by Dr. Seaward, of the Guzerat Irregular Horse. No other kind of boat appears to be used: this

* There is a sacred place of this name in Scinde.

seems to answer every purpose. It is easily made by the people on the spot, from the bulrushes which grow most luxuriantly. The dimensions of the "Trapa" or bulrush canoe are as follow :—extreme length 15 feet 3 inches ; circumference in the widest part 3 feet 8 inches. Its make is peculiar ; and when on the water it has a neat appearance, and can be propelled at a great velocity by a pole. The boatman stands upright on the part marked (*e*) in the side view of the trapa ; the part marked (*c*) in the same view has the two sides and the front part raised, to prevent the water coming on board : here either passengers or goods are placed for security.

The construction of this primitive boat displays considerable skill, and it is very stiff on the water. From the section (*d*) it will be seen that from the point (*c*) the two side pieces separate and act as outriggers : the stern piece or main trunk of the canoe increases in size to midships, and tapers into the fork at (*c*) made by the bow pieces. All the parts are firmly bound together with bulrushes, and the canoe keeps the form, as shown in the drawing, even when lifted, which two men can easily do, one at either end.

Much larger trapas are made and are employed in taking people from one place to another, as well as different articles of food ; also smuggled opium, which is taken in large quantities from the Guicowar districts across the Null into Kattyawar during the night. In February 1851, the time of my visit, the water of the Null was clear and sweet to the taste, but wherever a peculiar sort of grass was observed growing, the water was always clearer than in those parts where it was absent. In an iron punt, which I had brought for the purpose of examining the Null, it took us one hour with two men to punt straight across to the Kattyawar side. The natives calculate the distance across in a straight line at 3 cos, $4\frac{1}{2}$ miles.

There are few fish in the lake, and I only found the three or four kinds of shells mentioned.

The people along the shores use a peculiar sort of net for catching fish, called a "Champa." It is made of six sticks, 3 feet 6 inches in length, all secured at the upper end : the net is fastened to the lower end of the sticks, and it is spread like an umbrella when ready for use, and covers a circle of 6 feet in diameter. The upper end of the net is held by a loop on the finger, and the net is used by the person as he wades through the water up to his waist, or rather lower, by constantly raising the net and frame ; and as he advances pushing it down on the bottom. If a fish comes within the circle, it immediately strikes against the net, which motion is at once communicated to the finger by

the loop ; when the man at once drops the loop from his finger, and the net falls to the bottom, the sticks remaining upright : hands and feet are then employed groping for the fish. When secured, the loop is again adjusted, and the man advances. It is usual for a number of them to fish together in a semi-circle, and their mode of fishing appears to have been copied from the large stork so frequently seen in all tanks and rivers in Guzerat. It is, however, difficult to describe, beyond there being an alternate motion of the net as it is lifted and pressed to the bottom, first on one side, then on the other, and then in front, as the fishermen advance across a piece of water.

The name of the Null, it strikes me, must have originated from its having at one time been the channel which natives would designate *nāl* or *null* ; leading water from one place to another, as from the Runn into the Gulf of Cambay. Such channels are to be seen in the present day in the upper end of the Gulf of Cutch, as described in my paper on that locality, and if by any accident the three channels now existing in the Gulf of Cutch were closed up, we should have a similar, though larger, sheet of water than the Null at the head of the Gulf.

Lieutenant MacMurdo, of the Bombay Establishment, in 1813, describing this locality, states :— “An object deserving more notice and investigation than I am capable of affording is the Runn or swamp which surrounds the peninsula, and in fact makes it an island. The Gulf of Cutch penetrates as far as Patree and Bujjoima in Jhallawar, where it is joined by a similar swamp which is connected with the Gulf of Cambay near Dhollera. It would require a dissertation to do justice to this extraordinary piece of water ; but I may observe, that it is unusually and visibly increasing on the west side. There is also a tradition well-known, and generally believed, that the voice of man could be heard from Cutch to Kattyawar ; and opposite Jooira, now a sea port, there was a foot-path at low water ; but such is the obscurity in which transactions of yesterday are involved among the natives of the country, that even this last circumstance, which is attributed to a comparatively modern date, or about two hundred years ago, is merely a legend, the truth of which is not substantiated by any facts or records.”

There is a peculiar rank grass, or reed, which grows on the marshy lands adjoining the Null, which in seasons of scarcity affords food and employment to hundreds of poor people. The reed has a small bulbous root, of a dark colour, and covered with hair-like roots or fibres all over. This is dug up and dried in the sun ; the fibres are carefully removed, and the root is then ground into flour. The bread

made from this has a sweetish, and by no means an unpleasant taste, something resembling ginger-bread. To those accustomed to it from their birth it is nutritious enough, but, incautiously eaten in any quantity by persons used to more wholesome food, it is apt to bring on violent dysentery, and inflammation of the bowels, often proving fatal. The fibres are supposed by the people to be a deadly poison. It is this reed alone that renders the ground on which it grows valuable, and an object of contention among the villages around the Null. The reed or grass part affords an excellent thatch for houses.

By the end of the month of March the water in the Null has become brackish, and as the hot season advances becomes more and more so, until it is unfit for any purpose. In some seasons, when the fall of rain during the monsoon has been very scanty, the waters of the Null disappear, when the ground must assume the exact appearance of the Runn.

I was much surprised at finding so few wild fowl on the Null, for when all the tanks around were swarming with wild ducks of all kinds, scarcely one was to be seen on the water of the Null, though immense flocks of cormorants, shags, cootes, and such like, were to be seen in all directions. From this I should gather that although the water of the Null appeared sweet to the taste, there must be some saline ingredients in it, which renders it unpalatable to wild duck, though snipe along the marshy edges were abundant.

A few fields of wheat on the eastern shore were irrigated from the waters of the Null when I visited it, and they appeared in a flourishing condition. Rice is also extensively irrigated from the Null, and is the chief produce from the lands near the lake during the monsoon.

For the plan, area, and some other information embodied in this paper, I am indebted to the records of the Revenue Survey made in 1824. The information then recorded is equally applicable now.

ART. VII.—*Buddhist Cave-Temples in the Circars of Baitalbari and Dowlatabad, in H. H. the Nizam's Dominions.* By W. H. BRADLEY, Esq., Surgeon, Bombay Army, attached to H. H. the Nizam's Service.

Presented 17th March 1853.

WITH the following descriptions of the Cave-temple of Baitalbari and Dowlatabad, in H. H. the Nizam's Dominions, which were first brought to the notice of the Cave-temple Committee by Captain Rose, (see vol. iii. part 2, p. 350,) I have the pleasure to forward several Inscriptions in the Cave-character, which I was so fortunate as to obtain from the Pipal Khora Monastery, and also from the large Vihara upon the Baitalbari plateau. The whole are much defaced, but still I hope enough remains by which the general sense may be made out. I have also enclosed several others, taken by me on a late tour. The three long ones in the Balbodh character were unearthed by me from the ruins of an old temple at Bagli, in Kandish: the deity originally worshipped was Mahadeo, but at present it is occupied by Mangboas, who have devoted it to Krishna. The inscriptions were coated over with mud and white-wash. Though the Pundits to whom I have had an opportunity of showing these inscriptions are able to read the character, they cannot render the sense of it.

I would have forwarded some plans and drawings of the caves I have described, but having made them on a large scale, I must defer doing this for a few days, until I have adapted copies of them to the size of the Journal.

CAVE-TEMPLES OF BAITALBARI.

The first to be described occurs about 18 miles west of Ajunta, and near the once important fortress of Ousaghur. It lies shut out from the world in a *cul de sac* of the mountains, amidst deep narrow ravines, embowered in thick wood jungle, and with great difficulty approached, from the falling of the scarped frontage having buried under its *debris* the path leading to it. The table-land may here be, perhaps, 800 feet

above the lowlands of Kandish, lying at its feet: the caves occur about two-thirds the way down.

The first to be noticed is a fine Vihara cave, 80 feet square, with a general plan similar to the northern caves at Ajunta. It is called by the natives the abode of Guttoor Duz, and consists of an outer veranda, a central hall, with colonnade of boldly sculptured pillars; side aisles, into which recessed chambers and cells open; and a sanctuary, with vestibule, and side chapels.

The outer veranda has partially fallen; its length is 80 feet, and breadth 17 feet. The extremities are terminated by chapels, being chambers 13 feet square, with vestibules supported by two pillars, and two pilasters in antis. That upon the western side is much choked up with mud, and from the water collecting in that direction during the rains, the sculpture has become defaced. Upon the eastern side, the pillars are in good preservation: they are richly ornamented, having fluted shafts and amphoral capitals with clustering leaves pendant at either angle of the abacus. Bands of rosettes, chain-work, and drapery encircle the shaft. In a small recess of 2 feet square at the western side, there is an inscription in the old Cave-character. The words have been cut in the rock, and subsequently coated with fine stucco: the vowel points in many places appear to have been painted. Unfortunately the inscription, from its exposed situation, has become much eroded, leaving but a very small portion that can clearly be made out.

The outer veranda is pierced by five doorways, leading into the hall. The centre one is the most ornamented: its jambs are decorated with double figures, and scrolled floral designs, with a double frieze above, full of compartments, containing sculpture tolerably executed. The subjects are various: several represent Buddha in different positions of abstraction, and in one his attendants are snake-hooded, and bear vessels upon their shoulders. One group struck me as remarkable, from having noticed a *fac-simile* of it upon the walls in the hall of the Indra Subbha, at Ellora. It represents a female reclining in pensive mood upon a couch, gazed upon by a male figure from behind. The other groups have nothing particular to tell their tale: horsemen, carriages drawn by horses, and footmen, occurred; with elephants and crocodiles mixed up in the decorative designs of the frieze.

The two doors next the central one are plain, but the outermost have ornamented frieze work and sculptured figures on the jambs. The character of the sculpture above the door is the varied positions of Buddha in holy meditation, seated in temples with melon-shaped domes.

The hall, including the surrounding colonnade, measures 80 feet square. Twenty pillars support the roof, 13 feet high, and 3 feet 3 inches in diameter at the base, but something less at the upper part, which gives them an Egyptian air of solid grandeur. They have square pediments, and octagonal shafts, with bracket capitals. The four central pillars differ slightly from the rest, in having the shaft breaking from eight into sixteen sides. The aisles or colonnades surrounding the hall are 12 feet broad; those on the east and west sides are alike, and contain each a central recessed chamber, with two pillars and two pilasters in antis, and two cells 9 feet square on either side of the centre recess.

The south aisle, or inner veranda, has its eastern end closed by a cell; upon the west there appears a recess, and cell leading from it. Around the walls of the recess are ranged compartments, in which standing and seated figures of Buddhas and Bodiswatas appear, with several deghopas in high relief. One upon the north side is larger than the rest, and extends from the floor to the ceiling. A niche in the front of its basement contains a seated Buddha, holding up in his hands what appear to be the leaves of a scroll. Excepting a cross-legged seated Buddha cut upon one of the pilasters at the western side, no more sculpture is seen within the hall.

The northern aisle contains the vestibule and sanctuary, with side chapels. The pillars and pilasters of the vestibule are in design similar to those of the hall, and placed in antis. Within, two gigantic Bodiswatas stand beside the sanctuary door, as doorkeepers; the doorway is well proportioned, being 9 feet 6 inches high and 4 feet 3 inches broad. The jambs are ornamented with double figures in caressing attitudes, associated with floral running patterns.

The sanctuary contains Buddha seated on the Sinhasan, with the wheel in front, and antelopes below: his attitude is that in which the point of the right thumb meets the upper part of the left little finger. The height of the idol is colossal, measuring 8 feet 6 inches in his sitting posture. Two gigantic Bodiswatas, similar to those standing without, are in attendance right and left of the throne.

The chapels on either side of the sanctuary contain no sculpture. They are 9 feet square, and supported by two pillars and two pilasters.

I am inclined to believe that sculpture of much importance once decorated the entrance of this cave, judging from the remains of a very handsome colossal figure lying half buried close beside the outer veranda. The roots of the *Sterculia* and *Boswellia* have loosened and detached large masses of the hill-side, precipitating them into the

ravine below, and very probably blocking up the entrances to other caves. This sculpture is similar in style and character to the snake-hooded figures observed right and left of the porched entrance to Koilas at Ellora. My conjecture as to other caves being hidden under the talus of the hill arises from the circumstance of the rains a few years back washing away a portion of the slope some thirty yards north of this cave, and exposing the entrance to a vihara 21 feet square, supported by four pillars, and two pilasters.

In the hill-side of the opposite ravine I observed two or three openings, as if of caves : they looked exceedingly well at this distance, and I promised myself a grand treat, especially as I was assured by my guide that no *sahib logh* had ever seen them, and that they were full of idols. Moreover, the depth of the excavation was so enormous, that nobody had yet got to the end of it ! It required certainly some such stimulus to surmount the toil, and not a little danger, attending the scramble up that steep ascent. My mortification was proportionately great on finding all my labour had been taken in vain ; and that I might congratulate myself if I got down again without breaking my neck, the openings proving to be nothing but the commencement of a cave.

VIHARA CAVE AT BAITALBARI.

The fort of Baitalbari is perched on the summit of an isolated hill, looking over Kandish : in the northern front, close under the walls of the fort, a vihara cave is excavated 26 feet long, and 24 feet broad, supported by four square pillars, and four pilasters, in two rows. There is no decorative sculpture nor idol.

CAVE IN THE GUNISHA KHORA, NEAR THE FORT OF BAITALBARI.

This cave is dug at the head of a very romantic-looking glen, two miles east of Baitalbari ; a water-fall, trickling down the scarp all the year round, flows into a natural cistern that has been hollowed out of the rock, and evidently has been the inducement for making this spot the site of the cave-temple. It consists of a hall, divided into two chambers, with passages, out of which cells lead. Several small square excavations outside appear to have been shrines of some kind or other.

The natives call the cave the temple of Roodera Soor. Rude steps cut in the sheet rock lead by the edge of the cistern to the entrance, partly built, and partly tunnelled in the rock. It has two doorkeepers, 5 feet high, at the inner entrance. A cell opens right and left into the

passage. From the inner door to the hall there is a covered way, or veranda, in which are two cells or dormitories.

The hall is divided into two chambers by a bench, which also runs round their sides: the northern chamber is raised two steps from the southern one, and has been altered from the original plan, by building a chaboutra level with the benches, and placing on it the linga and the bull Nundee. The southern chamber contains a large figure of Gunputtee, rejoicing in a brilliant display of red-lead and oil, supported on his left by a sculptured representation of Veer Budra piercing the Dyot, and by Narsingha on his right, destroying Harsingha. Niches are cut in the rock upon the three sides.

BUDDHIST CAVES NEAR THE FORT OF KUNNAIRA, IN THE
PIPAL KHORA.

In a sequestered part of the hills some 14 miles west of Kunnur, and 2 or 3 from the Jooneeree Pass, a rather important series of Buddhist caves are found. Their situation is so completely retired, that the guides who showed me the way had some difficulty in hitting upon the right path. They are situated in the scarped sides of the head of a ravine, which, rising broadly in the Kandish valley, gradually contracts its sides as it rises the table-land, until it terminates in an abrupt cliff-like slope. As the site is viewed from the opposite side, the caves are seen to have had two stories, the remains of galleried chambers still existing in the face of the rock, and which were formerly in communication with the caves below by stair-cases tunnelled in the rock; these have all tumbled down the face of the hill, and half buried the entrance to the caves beneath their ruins.

The principal cave is the chaitya, the front of which has fallen with the caves above, exposing in a conspicuous manner its vaulted roof. It measures 85 feet from the fallen scarp to its further end, and 36 feet across from wall to wall. The nave, judging from the roof, has had thirty-five pillars, separating it from the side aisles. There are now but twenty visible, some of which have half fallen. They are octagons, without sculpture, but covered with stuccoed paintings of full length figures of Buddhist saints in long white tunics, and of all complexions, white, red, brown, and black. After considerable search, I was enabled to discover two inscriptions, which I copied as accurately as I could, the pale colour of the writing rendering them very illegible.

The roof has evidently been spanned by wooden ribs, which have disappeared, but left a discolored mark in the stucco, the ceiling having

been painted : holes are sunk in the rock, at the termination of these marks, evidently to receive the fastenings of the frame-work, which is the case also around the lower part of the walls of the nave, just immediately above the pillars. Mortices of larger dimensions are visible at the circular part of the nave to receive the tenoned machinery of the deghopa.

The deghopa, though apparently a very solid structure, lies shattered in fragments upon the ground : the base measures 12 feet in diameter. Its destruction has been evidently the work of a licentious bigotry.

The side aisles have a vaulted ceiling, and stone ribbings, the whole covered with stuccoed paintings of Buddhist saints, seated on lotus thrones, under triple umbrellas, with long white fringes : some have boys with shaved crowns kneeling before them. The drawings are good, and appear to have been executed with facility. The wall for about 4 feet from the ground is built up, owing to a defect in the strata of the rock. No inscriptions were found.

At the eastern side of the entrance there are three cells, with stone benches. An aperture in the broken rock half way up the side shows the tunnelled passage that led to the galleried chambers above.

Upon the west of the chaitya there are four viharas, and one upon the east. The first westward has the front fallen in, and much choked with broken rock. It contains sculpture of quite a novel and peculiar character, something similar in design to the monasteries of Cuttack, in the horse-shoe niche, and reeded string courses, but differing in other details. The hall measures 48 feet in length, and 23 in breadth : cells open into it on three sides. Originally it would appear that the roof had been supported by 12 pillars, and as many pilasters : there are but now the remains of four pillars, and ten pilasters.

The northern side has seven cells, each with a door and lattice, the latter being made to represent lacing of ropes, or reeds. Over each door, occupying the whole front, is a horse-shoe niche, and between each doorway stands a pilaster, with square basement, and octagon shaft, surmounted by a cushion-shaped capital, formed, as it were, of reeds bound together by cords, the whole yielding, apparently, to pressure.

The capitals support winged animals, arranged in pairs back to back, $1\frac{1}{2}$ foot high. They consist of maned lions, wolves, non-descript animals armed with claws and maned, but having heads like camels, horses, elephants, and centaurs. These winged figures are in good taste, and executed with much spirit. The peculiar style which characterises the sculpture is, I conceive, a subject of curious inquiry

as to whether the artist had derived his ideas from the banks of the Tigris or not.

Inscriptions in the old Cave-character are cut upon the wall over each lattice, but much defaced by the crumbling nature of the rock. The cells have vaulted roofs, with stone ribs, like the chaitya often possesses, and benches running round the walls: their dimensions are 8 feet long, and 7 feet broad. The east and west sides have three cells, like the centre ones, but the whole are much destroyed. An aperture in the east side, 6 feet square, led to the caves above, and there is also another dark tunnel leading out of the corner cell of the north side, up to the same outlet. The pilaster by the door of this cell differs from the rest in the animals upon the capital being without wings: they are bulls.

A doorway in the centre of the western wall opens into a large chamber 34 feet long, and 22 feet broad. Cells are ranged all round, but their fronts have fallen, and blocked up the cave. The entrance towards the Khora is quite choked up by fallen fragments of the scarp.

Two more viharas are found some short distance beyond; they are *fac-similes* of each other, differing slightly in their measurement, one being 39 feet long, and 33 feet broad, the other 33 feet long, and 30 feet broad. Cells are ranged on three sides—five in the centre wall, and four at either side. Their dimensions are 8 feet 7 inches by 7 feet. They are provided with stone benches, and some have small square recesses in the walls. The smallest of the two caves has had most care taken in the general details, the central cell in the northern wall differing from the other, by being ribbed and vaulted within, like the chaitya.

There remains one more excavation to be mentioned, situated east of the chaitya, and appears to have been abandoned after the general plan had been considerably advanced, probably from a defect in the rock, for a stratum of slaty trap, or decomposed phonolite, here occurs, to the depth of three or four feet, splitting into fragments on the slightest force being applied, and peculiarly ill adapted for purposes of extraction. The length is 110 feet, with a depth of but 24 feet. The ceiling and walls thus far are smoothed and finished: here and there side cells have been commenced upon, but so much rubbish, principally slaty fragments of phonolite, have fallen in, that it is difficult to say what has been intended.

It is remarkable, that amongst these caves no sculptured figure of Buddha appears, nor any emblems of the faith, beyond the large

deghopa: this would argue something for their antiquity. The only sculptured human figures seen, very mutilated, are high up in the scarp, at the spot where the galleries have fallen: they consist of a female standing behind a seated male figure. But the most remarkable circumstance is to be noted in the occurrence of *winged animals*. Their details are expressed with life and spirit—unusual with the conventionalities of cave-sculpture in general. The forms of the wings are bold and graceful, and whether the types be derived from Assyria or not, the resemblance is sufficiently striking and extraordinary.

ART. VIII.—*Descriptions of some of the larger Forms of Fossilized Foraminifera in Scinde; with Observations on their Internal Structure.* By H. J. CARTER, Esq., Assistant Surgeon, Bombay Establishment. With a Plate.

Presented 11th November 1852.

THROUGH the kindness of several officers of the Bombay Army, access to the Society's Museum, and my own experience in Scinde, I have become acquainted with many, if not most, of the larger forms of fossilized Foraminifera of that country; and as descriptions of them may prove acceptable to those engaged in the study of geology in Scinde and elsewhere, I have much pleasure in offering them for publication in the Society's Journal, should they be deemed worthy of it.

I wish it had been in my power to point out the particular parts of the Nummulitic Series in which they are found, but as we are perfectly ignorant of all detail of this kind respecting Scinde, it must be left for future opportunity to develop.

In the description of these Foraminifera, I shall not confine myself to their external characters alone, for, generally speaking, this would be useless, but having studied them by sections, shall also allude to their internal structure, which, though already given most faithfully by Dr.

Carpenter (Quart. Journ. Geol. Soc. vol. vi. p. 21), yet there are some parts still incomplete, which I shall endeavour to supply, and some observations which can only be made intelligible when the forms of *Operculina*, *Assilina*, *Nummulina*, *Alveolina*, *Orbitoides*, and *Orbitolites* are considered together and described successively.

The distinguishing characters of these genera, familiar, at least, in name, to all who are acquainted with the classification of Foraminifera in D'Orbigny's "Foraminifères fossiles du Bassin Tertiaire de Vienne," and in his "Cours élémentaire de Paléontologie et de Géologie Stratigraphiques," I shall here premise that the reader, if inclined to study them, may have no trouble in immediately referring to the same sources from which I have derived my guide.

Order III. HELICOSTEGUES.

Fam. I. NAUTILOIDÆ.

Genus NUMMULINA, D'Orbigny.

"*Shell*, free, equilateral, orbicular or discoidal, thick, encrusted, without appendices at the border, formed of a *spire* embracing, with whorls very near together and numerous; the last always marked in the young animal, but often impossible to be found in the adult. *Chambers*, small, short, near together, very numerous, the last projecting in the young animal, but indistinct in old individuals; pierced by an opening, transverse, linear, against the turn of the *spire*, often concealed in the adult."

ASSILINA, D'Orbigny.

"*Shell*, free, equilateral, orbicular or discoidal, very compressed, formed of a *spire* embracing only in the young animal. Afterwards whorls apparent, and without appendices at the border. *Chambers*, small, short, very numerous, the last projecting in the young animal, but not so in the adult, each pierced by an *opening* against the turn of the *spire*."

"*Relations and differences*.—The *Assilina*, like the Nummulines, have a projecting mouth when young; but they are distinguished by all the turns of the *spire* being apparent in the adults instead of being embracing.

OPERCULINA, D'Orbigny.

"*Shell*, free, equilateral, oval or discoidal, very compressed, formed of a *spire* not embracing, regular, equally apparent on both sides, turns contiguous, and increasing very rapidly. *Chambers*, numerous, narrow,

the largest projecting beyond all the rest, pierced at all ages by an opening which is visible, triangular, against the turn of the spire."

"*Relations and differences.*—It is evident, that by the situation of its opening, this genus comes near to the Assilines; but it is distinguished from them by its opening being triangular instead of a transverse slit; and by its chambers increasing regularly, without becoming narrow towards the opening."

ALVEOLINA, D'Orbigny.

"*Shell*, free, regular, equilateral, round, oblong, or elongated, in the direction of its axis, not variable in its enlargement, composed of a very regular *spire*, embracing at all ages; whorls often very near together, not formed of many chambers, elongated transversely, divided into a great number of capillary cavities by partitions longitudinal to the whorl, the openings round, numerous, and in lines transverse to the whorl."*

CYCLOSTEGUES, D'Orbigny.†

"Animal composed of numerous segments placed in circular lines. Shell discoidal, composed of concentric chambers, simple or multiple; no spire."

"*Cyclolina*, D'Orb. 1839. Shell discoidal, each chamber pierced by a number of pores, making an entire circle round the rest."

"*Orbitolites*, Lamarck, 1801. (*Orbulites*, 1816, non *Orbulites cephalopodes*.) *Marginopora*, Quoy et Gaimard, 1836. Shell discoidal, plane, equal, and encrusted on both sides, presenting concentric lines. Chambers numerous in irregular transverse lines only visible at the border."

"*Orbitolina*, D'Orb. These are *Orbitolites* with unequal sides; the one convex, encrusted, presenting concentric lines; the other concave, not encrusted; presenting numerous chambers, in oblique lines upon the side at the circumference."

"*Orbitoides*, D'Orb. Shell discoidal, convex on both sides, formed of a single range of chambers, round the disk, very thickly encrusted about the middle, and presenting either radiating lines or granulations."

* Foram. Foss. du Bassin Tert. de Vienne, par M. Alcide d'Orbigny.

† Cours élément. de Paléontologie et de Géologie Stratigraphique, par M. Alcide d'Orbigny.

Observations.

To these characters I shall add the following observations before proceeding further :—

First, as regards the distinction between the genera *Assilina* and *Nummulina*. This is said to consist chiefly in the spire not being embracing in the former, and which appears to be the case to the naked eye. But if we make a vertical section of *Operculina*, which, from its extreme thinness, is still further removed from *Nummulina* than *Assilina*, it will be seen, under a magnifying power, to be formed of several layers, which may be traced from the centre to the circumference, showing, that as the turn of the spire is progressing, the deposition of new material not only takes place at the margin, but on both sides of the shell generally, in a line from the last chamber in process of development up to the central or first-formed one. If, then, this can be seen in a shell so thin as that of *Operculina*, how much more evident must it be under the same circumstances in *Assilina*! which is the case. D'Orbigny's grand distinction, therefore, of the spire not being embracing in *Assilina*, would seem to be more apparent than real, and although sufficient for common purposes, yet, if we add to it the *absence* of chambers above and below the central plane, we shall not only have a real, but a more evident distinguishing sign for *Assilina* than the one given by D'Orbigny.

Second, as regards the division of *Nummulina* into subgenera.

It appears to me that this may be advantageously done by separating those in which the septa extend from the circumference to the centre in more less continued sinuous lines (Plate II. figs. 11 & 15), from those in which the lines are so branched and inosculate as to present a densely reticulated structure (fig. 21).

Such differences have already been alluded to by Dr. Carpenter. (*Loc. cit.*)

In the latter subgenus would then come *Nummularia acuta*? Sowerby, which borders close upon *Orbitoides*, from possessing this reticulated structure on the surface, a comparatively less development of the spire and chambers, a tendency to an abrupt prominence in the centre, and an expanded thin margin.

From *N. acuta* we should then pass on to *Lycophris dispansus*, Sowerby, where the spire is still more incomplete, and then to *Orbitoides Mantelli* or *Orbitolites Mantelli* (for we shall see hereafter that we must make this an Orbitolite), where the spire is entirely lost.

In the last two genera I have been at much pains to ascertain if the

rows of chambers in the central plane are arranged spirally or concentrically, and I think that I have been as successful as, under the circumstances, we can expect to be.

For some time I was unwillingly obliged to yield to the opinion of D'Orbigny, that the rows of chambers commenced concentrically, for having taken adult specimens of *Lycophris dispansus* and *Orbitoides Mantelli* for sections, I found the centre in each species invariably filled with calc-spar, which, apparently, was surrounded by circles of chambers at its circumference, that is, where the latter began to appear. Hence I had given up almost all hope of being able to determine this satisfactorily, when I conceived that the origin of this structureless centre might be owing to a decay of the central chambers in the adult animals only, and its subsequent filling with calc-spar during fossilization; and, that, if I took very young individuals, I might obtain what I wanted. Accordingly, I made sections of specimens not larger than the 24th part of an inch in diameter, and found just what I had expected, viz. the centre in its natural state, that is, filled with chambers to the central point.

I will now shortly describe the central planes in both these species, reserving a more particular account of them until we come to the descriptions of the species themselves.

In *Lycophris dispansus* the central plane is extremely, though uniformly, thin throughout, and only one chamber deep. The chambers commence in an imperfect spire, round a central spheroidal or oval cell, not much larger than the chambers themselves generally. Around this cell are a few chambers which have—one a semilunar, and two or three the pear-shaped forms of the chambers commencing the spire in the nautiloid forms of Foraminifera (compare fig. 26. Pl. II. with fig. 8, Pl. xviii. vol. iv.); the rest are more or less polygonal. From these chambers (about seven in number) as many rows of others fly off from the centre in whorls similar to the sparks of a rotatory firework, but these rows soon diminish in breadth, and end more or less abruptly upon the back of each other; when another set rises from their circumference, which takes a larger latitude; and so on successively, a series of whorls or wreaths follow upon the back of each other, until the rows appear to form concentric circles, still every here and there dipping inwards, or suddenly terminating on the preceding ones, even to the circumference. This is the appearance presented by the central plane; but the real spire must be traced across the rows in the position that it would be in Foraminifera wherein it is more perfectly developed,—if, indeed, it be traceable at all.

In *Orbitoides Mantelli*,* however, the central plane is very different ; here it is not uniformly thin throughout, but thin in the centre and thick at the circumference, from the cells being only half the size in the former than they are in the latter ; they are also all spheroidal, or elongated vertically, and not quadrangular. When they are elongated vertically, this seems to depend on two or more running into each other in this direction ; hence the central plane, instead of being composed of only one layer of quadrangular chambers, as in *O. Mantelli*, is composed of a plurality of layers of spheroidal ones : this, together with the smallness of the central cells, their great similarity, and the whole plane which they compose being more or less wavy, renders it almost impossible in the section to detect the central cell itself, or to determine whether the others are arranged around it in concentric circles ; while it seems almost equally impossible to trace them in circles towards the circumference, to determine this, where their arrangement even is most distinct.

Hence it would appear that D'Orbigny is not warranted in giving the distinguishing character of concentricity to the rows of chambers in his order *Cyclostègues*, for in his three first genera, which are all alike in this respect, we have seen that it is almost impossible to determine this ; and in the last genus, viz. *Orbitoides*, of which *Lycophris dispansus* is a type, it is evident that it is not the case, but that the chambers are arranged subspirally.

That *Orbitoides Mantelli* should be included among the *Orbitolites*, and not among the *Orbitoides*, must also now be evident, from the striking differences that exist between it and *Lycophris dispansus*, and its identity in structure with *Orbitolites* generally ; while the intervening link between it and *Nummulina* is naturally supplied by *Orbitoides* bearing the characters above mentioned. It may be observed, that the cells of the central plane in *O. Mantelli* are elongated, and not spheroidal, but the one seems to be as constant as the other, and the elongation vertically only to depend, as before stated, on the thinness above and below of the walls of the cells forming the central plane, which renders those parts imperfect or imperceptible in the vertical section, and makes the cells appear to run into one another ; while the opaque material or intercellular substance showing out at their sides gives them that septal, and at the same time quadrangular form, which approximates the whole central plane in appearance to that seen in the vertical section of *Orbitoides* and *Nummulina*.

There are several other observations which I have to make on the structure of these two genera, but they will be better understood in connection with their species when respectively described.

As the list of synonyms of the discoidal Foraminifera already described is very great, for the short time they have become interesting,* at the same time that their descriptions are very few, and not within my reach, I shall avoid as much as possible introducing new names here, in hope that others who are more favourably situated may be able to do this from my descriptions and figures, if required, or that I may be able to do it myself at some future period, when I have better means of comparing the specimens of different localities than I at present possess. Meanwhile, as so little has been done in the subject, I am not without hope that that which I have now to offer may be found useful.

In order of description I shall not exactly follow D'Orbigny's arrangement, that I may be the better able to show the transition from the simple to the more complicated forms of discoidal Foraminifera. Thus, I shall place *Operculina* before *Nummulina*, &c., *Alveolina* after *N. obtusa*, Sowerby, and before *N. acuta*, id. ; and then pass on to *Orbitoides* and *Orbitolites*.

The figures in the Plate are intended to represent the largest specimens of the species I have met with respectively ; and where the characteristic structure externally has been too minute to be seen by the naked eye, a small portion has been magnified in the centre. Indeed, in almost all, the lines and makings are larger than they are naturally, and are therefore represented as seen under a magnifying glass of low power, for in no other way could these characters be given.

As a typical description of *Operculina* and the structure of foraminiferous shells generally, I must refer the reader to my observations on *O. Arabica*, published in vol. iv. No. xvii. of this Journal, by a perusal of which an understanding of what follows will be much facilitated.

OPERCULINA, D'Orbigny.

1. *Operculina inæquilateralis*. (H. J. C.) Inequilateral, oval or discoidal, thin, horizontal or wavy ; centre prominent, margin thickened, rounded, cord-like. Spire more or less irregular, more apparent on one side than the other, consisting of three whorls, concave on one side, flat on the other, increasing rapidly from a central cell. Chambers

* See Murchison on the Structure of the Alps. (Quart. Journ. Geol. Soc. vol. v. p. 309.)

numerous, narrow, slightly reflected. Septa reflected, more apparent on one side than the other. Diameter of largest specimens 5–24ths of an inch (Plate II. figs. 1, 2).

Loc. Muskat, in Arabia.

Obs. This species differs a little from D'Orbigny's characters in being inequilateral, but the difference between the two sides is so slight that it cannot be referred to any other genus. The intercameral communication I have not been able to make out, and although D'Orbigny almost invariably gives its shape and position in the nautiloid Foraminifera as a distinguishing character, yet I have hardly ever been able to see it satisfactorily in any of the species that I have examined.

O. inaequilateralis is a characteristic fossil of a thick, pink-coloured, silico-calcareous, sandy stratum at Ras Ghissa, the first little cape south of Muskat, which is a port on the north-eastern coast of Arabia opposite Scinde. I have inserted its description here chiefly for the purpose of commencing with the simplest form of nautiloid Foraminifera, and also from its proximity in locality to Scinde.

2. *O.* —? Equilateral, discoidal, plane or slightly wavy, thin. Centre prominent, and presenting granulations or small tubercles, projecting more in the young than in the adult state; tubercles, situated over the septa, one to each; margin slightly thickened, rounded, cord-like. Spire more or less regular, equally evident on both sides; consisting of six whorls, gradually increasing to the last, which is 1–24th inch broad; each whorl over-lapping or embracing, with its internal border the external margin of the preceding one, which is rounded and cord-like. Chambers numerous, reflected; septa reflected, apparent on both sides. Diameter of largest specimens 5–12ths of an inch; thickest part, which is the margin, 1–36th of an inch (figs. 3, 4).

Loc. Scinde; in company with *Alveolina*, near the town of Tatta.

Obs. In this species, which is twice the diameter of the last, and generally more horizontal, the whorls are more numerous, and the spire increases more gradually. I could not discover the intercameral communication.

ASSILINA, D'Orbigny.

1. *A. irregularis.* (H. J. C.) Equilateral, discoidal, more or less wavy, compressed, thin. Centre depressed, margin thickened, rounded, cord-like. Spire more or less irregular, projecting on both sides, excepting in the centre, where it is nearly obscured; consisting of nine whorls, increasing gradually towards the penultimate, which is 1–12th inch wide; each whorl overlapping or embracing, with its internal

border the external margin of the preceding one, which is thickened, rounded, and cord-like throughout the spire. Chambers subquadrangular, oblong, irregular in size, presenting a number of minute granulations over their surface externally. Septa straight, radiating, and a little reflected, evident on both sides, except in the centre. Diameter of largest specimens 11–12ths of an inch; thickest part, which is the margin, 1–24th of an inch (figs. 5, 6).

Loc. Scinde.

Obs. This, although somewhat resembling the last-described species of *Operculina*, differs from it in being much larger and coarser in form, in the extreme irregularity of its spire and development generally, the depression in the centre, the obscurity of the three first whorls, and in the penultimate whorl being the broadest. I could not discover the intercameral communication.

2. *A.* — ? Equilateral, discoidal, slightly wavy, thick, smooth, depressed in the centre, angular at the margin, presenting broken curvilinear lines on the surface with minute granulations between them, arranged in a spiral form, radiating from the centre, indicating the position of the spire and septa. Internally whorls more or less wavy, more or less irregular in breadth, the largest between the centre and the circumference (2–48ths of an inch broad); about nineteen whorls may be counted within half an inch of the centre. No chambers above or below the central plane. Diameter of largest specimens $1\frac{1}{2}$ inch; thickest part, which is between the centre and the margin, 3–12ths of an inch (figs. 7, 8).

Loc. Scinde.

Obs. This closely approaches *Nummulina* from its size and thickness: the spire and septa, however, are still more or less visible externally, but the increased thickness of the shell obscures their prominence, and gives the surface more smoothness and uniformity. The edge is thick and angular, instead of being round and cord-like, as in the forgoing species, and the whole now closely approximates a Nummulite.

NUMMULINA, D'Orbigny.

1. *N.* — ? Equilateral, discoidal, more or less wavy, thin, gradually diminishing in thickness from the centre towards the margin, presenting on the surface numerous small papillæ or granulations, between sinuous lines running more or less irregularly from the centre to the circumference, the latter being the most evident of the two in the young shell. Internally whorls more or less wavy, more or less irregular in breadth; the widest between the centre and the circumference (2–48ths inch

broad) : about twenty whorls may be counted within half an inch of the centre. Compressed chambers above and below the central plane. Diameter of the largest specimens $2\frac{1}{4}$ inch ; thickness in the centre 2-12ths of an inch (figs. 9, 10).

Loc. Scinde.

Obs. The great point of difference between this and the last-described species of *Assilina* is the presence of the compressed chambers above and below the central plane in the former. The whorls here, therefore, are evidently what are termed embracing, and the centre is prominent on both sides instead of being depressed. This Nummulite attains the largest size of any species that has come under my observation.

2. *N. millecaput?* Equilateral, discoidal, more or less wavy, thick, angular at the margin, presenting sinuous lines on the surface in close approximation, which extend from the circumference to the central prominence on each side, presenting a series of superficial whorls in the adult animal. Internally turns of the spire very numerous, more or less wavy and irregular in breadth, the widest between the centre and the circumference 1-48th of an inch broad ; about forty-eight whorls may be counted within half an inch of the centre ; compressed chambers above and below the central plane. Diameter of the largest specimens $1\frac{1}{4}$ inch ; thickness in the centre 3-12ths of an inch (figs. 11, 12).

Loc. Egypt.

Obs. This differs from the foregoing species in its general thickness ; the number and approximation of its sinuous lines, the absence of the small granulations or papillæ between them, and the greater number and narrowness of its whorls. The sinuous lines, although confused, and in whorls all over the surface in the adult animal, are nevertheless distinctly sigmoid in the young one, running from the circumference to the central prominence of the shell on both sides.

This specimen was brought from Egypt. It appears to be *N. millecaput*. That figured by MM. Joly and Leymerie is $1\frac{1}{4}$ inch in diameter. Generally the *Nummulites* of this kind from Egypt which I have seen (those of the Pyramids to wit) have been about an inch in diameter, and about 2-12ths inch thick. I have inserted its description here, and figure in the Plate, for the sake of comparison, not having met with one of exactly the same kind in Scinde.

3. *N. obtusa*, Sowerby. Equilateral, more or less globular, compressed in the centre, obtuse at the margin. Surface presenting sinuous lines in close approximation, and in confused whorls in the

adult animal, but simple and sigmoid in the young shell; extending from the septa at the circumference to the central prominence on each side. Internally whorls numerous, the broadest between the centre and the circumference; lines of the spire nearly as widely separated above and below the central plane as they are in the central plane itself. Chambers numerous, reflected; septa reflected. Diameter of the largest specimens 11-12ths of an inch; thickness 2-10ths; number of whorls thirty-three (figs. 13, 14).

ALVEOLINA, D'Orbigny.

1. *Alveolina melo*, D'Orb. (*Melonites spherica*, Lamarck.) Spherical, equilateral, presenting longitudinal lines, which extend in a sigmoid form from apex to apex, and minute transverse parallel ridges between them, marking corresponding internal divisions of the chambers. Internally chambers fusiform, sigmoid, divided into hair-like spaces by transverse septa, which are the continuations of the ridges mentioned; the whole arranged in a spiral form. Diameter 5-24ths of an inch (fig. 15).

Loc. Scinde, Arabia.

2. *Melonites spheroides*, Lamarck (fig. 16).

Loc. Scinde, Arabia.

Obs. This has the same characters as the last, with the exception of being larger, and a little elongated. Longest diameter 7-24ths of an inch; transverse diameter 6-24ths. Abounds about Tatta in Scinde, where it is well known by the name of "tomra," and is made into strings of beads for Hindu pilgrims, and others of the Hindu faith. They are said to be prepared for this purpose by being repeatedly struck with a hammer, until the external layers, peeling off, leave a smooth surface.

3. *Fascicolites elliptica*, Parkinson (fig. 17).

Loc. Scinde.

Obs. This also has the same characters as the foregoing species, but is much elongated, almost cylindrical. Length 7-24ths of an inch; breadth 3-24ths. It abounds about Hyderabad, and near the Buran river, in company with a discal *Orbitolite*, to be hereafter described.

There is nothing to distinguish these species one from another but their spherical, spheroidal, and elliptical forms respectively. The two latter appear to have their peculiar localities in Scinde, and to be sparingly mixed together. On the south-east coast of Arabia, where they are also found in company with discal *Orbitolites*, the spheroidal form is most common. D'Orbigny has made them the last genus of his

second section of nautiloid Foraminifera, but I have inserted their description here, to show the transition from the flat to the elongated forms of his *Helicostegues*.

Let us now return to the descriptions of the other *Nummulites*, which will be found to differ from the foregoing in the absence of the sinuous lines on the surface, and in the presence of the reticulated structure mentioned.

NUMMULINA, D'Orbigny. (Subgenus.)

4. *Nummularia acuta?* Sowerby. Equilateral, discoidal, wavy; centre rather abruptly prominent, margin thin, acute; surface presenting a subgranular, reticulated structure, the interstices of which tend to a spiral arrangement towards the circumference. Internally consisting of a thin central plane of chambers arranged in a spiral form, with layers of compressed ones above and below it. Whorls numerous. Chambers three times as long as the whorl is broad. Septa straight, or but slightly reflected; each chamber divided into three or more reticulate divisions by sub-septa, which structure, extending from the circumference to the central prominence, gives the surface the reticulated appearance mentioned; each interstice corresponding to a compressed cell, which is the external extremity of a columnar pile extending down, more or less regularly, to the central plane. Diameter of largest specimens 7-12ths of an inch; thickness in the centre 3-10ths (figs. 21, 22).

Loc. Scinde.

Obs. This appears to be *N. acuta*, Sowerby, (Grant's Geol. Cutch, *loc. cit.*) from its subgranular surface, size and shape. I do not know any other species like it in Scinde, if this be not the one. There is another species (figs. 19, 20) of this character which abounds in the nummulitic rocks at the island of Masira, on the south-east coast of Arabia, but this appears to be *N. Garansiana*. (Joly et Leymerie, *Mém. sur les Nummulites*, pl. 1, figs. 9-12.) It is also subgranular on the surface, and presents the reticulated structure of the species just described, but with a tendency to radiation in its lines, which approximates it to the *Nummulites* of the first class, and therefore its place here should precede *N. acuta*. Its diameter is 9-24ths of an inch, and its thickness 3-24ths of an inch.

The reticulated structure on the surface, while it characterizes this subgenus of *Nummulina*, also allies it strongly to *Orbitoides*. Another character which distinguishes *N. acuta* from the foregoing species is the greater length of the chamber being in the direction of the spire,

instead of across it, and its subdivision into reticulate ones, which, with the thinness of the central plane, implies a commencing disappearance, or imperfect state, of the latter generally; it is also more abruptly prominent in the centre, and thinner and more expanded in the margin. All this, while it separates *N. acuta* from the *Nummulites* of the first class tends towards the structure of *Orbitoides*, in which the chambers of the central plane are arranged subspirally. The lines, too, which are seen descending, in this as well as in other discoidal Foraminifera, to the central plane, are but the opaque matter filling up the interstices between the reticulate chambers; and in the midst of which are situated the interseptal vessels, which pass down to the central plane, and ramify throughout the shell.

CYCLOSTEGUES, D'Orbigny.

ORBITOIDES, D'Orb.

1. *Lycophris dispansus*, Sowerby. (Grant's Geol. Cutch, *loc. cit.*) Discoidal, wavy, more or less equilateral, centre abruptly prominent, margin expanded, and excessively thin and fragile at the edge; surface subgranular or tuberculated, especially over the central prominences; tubercles round, irregular in size and shape, united together by stellate lines. Internally presenting an extremely thin plane of quadrangular chambers, compressed vertically, oblong, and arranged subspirally, with their long axis in the direction of the horizontal diameter of the shell. Compressed chambers above and below the central plane, arranged in successive layers, like those of *Nummulites*, and more or less over each other, so as to form columns, which radiate more or less regularly from the central plane to the periphery, and end in the tubercles before mentioned. Diameter of largest specimens half an inch (figs. 23-29).

Loc. Scinde, Cutch, and Arabia.

Obs. I have already stated that the chambers of the central plane (fig. 24) of this genus commence from a central cell. This cell is spheroidal or elliptical, and perhaps a little larger than the generality of those which succeed it; the next formed is semilunar, and then comes a pear-shaped chamber or two; after which, the rest, that are in contact with the central cell, are more or less polygonal. From each of these chambers comes off a line of others in a spiral form, which, diminishing abruptly in breadth, terminates upon the back of the preceding one, the first being the shortest; to this succeeds another series of lines or rows, terminating in like manner, but of wider extension; and so on successively, until the plane, as before stated, appears

to be formed of concentric circles. Sowerby's account and figures of the external and internal structure of this fossil (*loc. cit.*) accord with my own observations; but Dr. Carpenter, (*Quart. Journ. Geol. Soc. loc. cit.*) I think, has been misled in considering the pillars of Sowerby "nothing more than the opaque matter filling the perforations;" since by a proper section these columns are seen, as before stated, to be the piles of compressed cells (fig. 29), as they ascend from the central plane surrounded by the "opaque matter" to the periphery. It is in this "opaque matter" that Dr. Carpenter's "perforations" are situated, that is, in the interseptal or intercellular spaces, which it partially fills; his perforations being the orifices of the interseptal vessels described in the structure of the shell of *Operculina Arabica*. (*Loc. cit.*)

In this species of *Orbitoides* we have the "stellate lines" uniting, or as it were supporting the columns of the cells. They consist of bars or vertical septa of opaque matter extending from one column to another, in straight lines, but diminishing in thickness towards the central plane, where they become faint and at last disappear altogether. They form the only distinguishing character between this species and *Orbitoides Prattii* (see illustrations to Dr. Carpenter's paper, *loc. cit.*); yet I am pretty sure that I have seen them in a section of the latter, near the central plane (where of course they were not present on the surface,) just as they are represented in fig. 14 *b* of Dr. Carpenter's illustrations, which this author regards as a feature of an undescribed species. Hence I am inclined to the opinion that *Lycophris dispansus* and *Orbitoides Prattii* are but varieties of the same fossil.

I should also here mention, that when the central plane of *Lycophris dispansus* is ground down to an extreme thinness, an interseptal space appears between the septa and an opaque line in the centre of it, indicative of the former existence of an interseptal vessel there, as in *Operculina* and *Nummularia*: this is also seen in Dr. Carpenter's illustrations (fig. 34).

2. *Lycophris ephippium*, Sowerby. (*Loc. cit.*)

Loc. Cutch.

Obs. Of this fossil Mr. Sowerby states: "These two fossils [*Lycophris dispansus* and *L. ephippium*] may possibly be different stages of growth of the same species," which seems to me very probable.

3. *Orbitoides Prattii*.

Loc. Scinde, Cutch, Arabia.

Obs. I have just stated the reasons which induce me to think that this is merely a variety of *Lycophris dispansus*.

ORBITOLITES, D'Orbigny.

1. *Orbitolites Mantelli*. (H. J. C.) *Nummulites Mantelli*, Morton. (Quart. Journ. Geol. Soc. vol. iv. p. 12.) *Orbitoides Mantelli*, D'Orbigny. (*Ib.*) Discoidal, wavy, equilateral or inequilateral; centre abruptly prominent on one or both sides, margin more or less expanded, very thin, plane or wavy, more or less obtuse at the edge; surface smooth, subgranular or tuberculated, especially over the prominent portions of the centre; tubercles minute, round, irregular in size and shape. Internally presenting a central plane, thin at the centre, thick at the circumference, composed of spheroidal or elongated cells, small in the centre, large at the circumference, placed in rows which appear to have a concentric arrangement, but this is indeterminable; cells alternate in adjoining rows. Compressed chambers above and below the central plane, arranged in successive layers like those of *Orbitoides* and *Nummulites*, more or less over each other, so as to form columns which radiate from the central plane to the periphery, where they end in the granulations or tubercles mentioned. Diameter of largest specimens half an inch (figs. 30, 31).

Figs. 32, 33, 34 appear to be merely varieties in form of the same species.

Loc. Scinde, Arabia.

Obs. This fossil, though at first sight almost identical with *Orbitoides*, is nevertheless on minute examination strikingly different. 1st. It is for the most part inequilateral, which at least is the opposite with *Lycophris dispansus*; its surface also is smoother from the granulations being more minute. 2nd. The central plane is thin in the centre and thick at the circumference; in *Orbitoides* it is extremely and uniformly thin throughout. 3rd. It is composed of a plurality of layers of spheroidal or elongated cells (figs. 36, 37); in *Orbitoides* it consists of a single layer of quadrangular cells (fig. 27). 4th. The cells are very minute and confusedly arranged in the centre; in *Orbitoides* they are as large in the centre as at any other part, and distinctly arranged. All this, while it tends to separate *Orbitoides Mantelli*, D'Orb., from *Lycophris dispansus*, which is a type of the genus *Orbitoides*, approximates it just as much more to *Orbitolites*; hence my reasons for changing its name.

The subgranular or tuberculated form which this species, as well as *Lycophris dispansus*, presents externally, arises from the extremities of the columns of compressed cells projecting above the surface, increased sometimes, probably, by the intercellular substance having been worn

or dissolved away; but this is not the case towards the circumference, on account of the columns being shorter, more vertical, and therefore nearer together, which of course renders the intercellular space smaller.

The septa seen in a vertical section of the central plane consist of opaque matter, which surrounds the columns, and as the latter end more or less in pointed extremities upon an imaginary central plane, we often see those of the opposite side interknitting with them, and the chambers of the centre of the plane assuming a triangular shape (fig. 39); sometimes they are quadrangular, and the septa continuous across the plane (fig. 38); at others they are oblong vertically, and curved a little outwards, like the septa seen in a vertical section of the central plane of *Nummulites*, which is their common form towards the circumference (fig. 36); while, just as often, the central plane is composed of two or three layers of spheroidal cells entire (fig. 37); from which I am inclined to infer, that where the other forms appear, it is merely from the cells running into each other vertically, and their parietes in this direction disappearing partially or altogether. In examining a vertical section of this plane, we frequently observe that every other space is a septum, and not a cell: this is owing to the cells being arranged alternately in adjoining rows.

2. *Orbitolites* — ? Equilateral or inequilateral, discoidal, patulous, more or less wavy, gradually diminishing in thickness from the centre, which projects a little above the general surface, to the margin, which is thin, though more or less obtuse at the edge. In other respects the structure of this is the same as that of the last species described. Diameter of largest specimens 2 inches; thickness 3-24ths of an inch (figs. 40, 41).

Loc. Scinde.

Obs. The great points of difference between this and the last species are, that it is not abruptly prominent in the centre, and diminishes gradually to the margin. It also attains a far larger size; and, as Dr. Carpenter has remarked, *loc. cit.*, sometimes “seems, instead of being a circumscribed disk,” to have spread itself irregularly in every direction. The latter character is not more peculiar to it, however, than to the foregoing species.

From its frequent deep, patulous and wavy form, too, the horizontal sections of this Orbitolite in the matrix in which it may be imbedded often indicate a stellate, or other complex figure, which, however, is not the case; for with the exception of the foliaceous extension men-

tioned, it seems almost always to be discoidal. It is sometimes thicker on one side than the other, like the last species, but tends more to a horizontal than a vertical development, and therefore more nearly approaches the species about to be described, which is altogether discal, and without any incrustation on either side, being representative only of the central plane of this and the last species.

D'Orbigny's genus *Orbitolina*, in which there is an incrustation on one side only, I have not yet seen, unless fig. 33 be considered a species, where one side is plane and the other convex; but this, I think, may be a variety in form of either of the foregoing species, for, after all, it has an incrustation of compressed cells on the plane side, although not prominent. That species I consider to have no incrustation where the so-called central plane comes to the surface.

CYCLOLINA, D'Orbigny.

1. *Cyclolina pedunculata*. (H. J. C.) Inequilateral, discoidal, smooth, thin in the centre, with a small papillary eminence on one side; thick at the margin; presenting concentric circles on the surface, alternately raised and depressed, with cells arranged circularly, which are hardly visible to the naked eye (fig. 42). Cells small in the centre, enlarging towards the circumference, spheroidal interiorly, elongated at the surface (fig. 44), arranged in circular rows alternate in each row. Diameter of largest specimens 10-12ths of an inch; thickness at the margin 1-48th of an inch (Pl. II. figs. 42, 43).

Loc. Scinde.

Obs. This is, as it were, nothing but the central plane of the foregoing species; that is, its development rests here, there being no incrustation on either side, and no compressed cells above or below the disc. I have called it *pedunculata* from the little papillary eminence in the centre on one side, this being constant in the few specimens I possess.

Thus we have passed, in description, from the simple nautiloid form of *Operculina*, in which the spire and septa are all visible exteriorly, to *Asilina*, where they are more or less obscured in the centre; thence to *Nummulina*, where there is an addition of compressed chambers on each side the central plane, expanding above and below into the globular form of *N. obtusa*; and elongating in *Alveolina*. Returning to the subgenus of *Nummulina*, which presents the "reticulated structure" externally, we have passed on to *Orbitoides*, where the characteristic spiro-central plane of the nautiloid forms of Foraminifera is beginning

to disappear, and then to *Orbitolites*, where it is entirely lost; ending with *Cyclolina*, which bears the same relation, in the simplicity of its structure, to *Orbitolites*, that *Operculina* bears to *Nummulina*.

EXPLANATION OF PLATE II.

- Fig. 1. *Operculina inaequilateralis* (No. 1). 2. Vertical section of ditto.
 Fig. 3. *O.* —? (No. 2). 4. Vertical section of ditto.
 Fig. 5. *Assilina irregularis* (No. 1). 6. Vertical section of ditto.
 Fig. 7. *A* —? (No. 2). 8. Vertical section of ditto.
 Fig. 9. *Nummulina* —? (No. 1). 10. Vertical section of ditto.
 Fig. 11. *N. millicaput?* (No. 2). 12. Vertical section of ditto.
 Fig. 13. *N. obtusa*, Sowerby (No. 3). 14. Vertical section of ditto.
 Fig. 15. *Melonites spherica*, Lamarck (No. 1). 16. *M. spheroides*, id. (No. 2).
 17. *Fascicolites elliptica*, Parkinson (No. 3). 18. Arrangement of the septal lines at the apex in the last three species.
 Fig. 19. *Nummulites Garansiana?* 20. Vertical section of ditto.
 Fig. 21. *Nummularia acuta*, Sowerby (No. 4): *a*, magnified view of reticulated structure on the surface. 22. Vertical section of ditto.
 Fig. 23. *Lycophris dispansus*, Sowerby (No. 1): *a*, magnified view of reticulated structure on the surface. 24. Vertical section of ditto. 25. Stellate arrangement of tubercles, magnified. 26. Central part of central plane of chambers, magnified. 27. Portion of vertical section of ditto ditto. 28. Magnified view of septa, showing interseptal spaces and remains of interseptal vessel? 29. Vertical columns of cells ending in tubercles, magnified.
 Fig. 30. *Orbitolites Mantelli* (No. 1): *a*, magnified view of reticulated structure of the surface. 31. Vertical section of ditto. 32, 33, 34. Vertical sections of varieties.
 Fig. 35. Central plane of *Orbitolites Mantelli*, magnified. 36. Vertical section of elongated cells of ditto. 37. Vertical section where the cells are entire, and have not run into each other. 38. Vertical section of central part of central plane where the chambers are quadrangular. 39. Ditto where the internal ends of the columns interlace with each other.
 Fig. 40. *Orbitolites* —? (No. 2): *a*, magnified view of surface, showing reticulated structure; *b*, the same still more magnified; *c*, arrangement of the cells of the central plane towards the circumference. 41. Vertical section of ditto.
 Fig. 42. *Cyclolina pedunculata* (No. 1). 43. Vertical section of ditto. 44. Arrangement and form of cells in vertical section of ditto. 45. Ditto on the surface.

ART. IX.—*Description of Orbitolites Malabarica, illustrative of the Spiral and not Concentric Arrangement of Chambers in D'Orbigny's Order Cyclostègues.* By H. J. CARTER, Esq., Assistant Surgeon, Bombay Establishment. With a Plate.

Presented 17th February 1853.

ORBITOLITES MALABARICA. (H. J. C.)

Description.—Free, discoidal, thin, plane or slightly concave on one side, convex on the other, smooth; presenting spiral lines on the surface extending from the centre to the circumference. Margin thick, round, rugoso-reticulate longitudinally, with one or more pores in the interstices; each pore surrounded by a raised rim or border. Size, 1-30th of an inch thick at the circumference; 7 to 8-12ths of an inch in diameter (Plate II., A, figs. 1 & 3).

Internal Structure.—Composed of several layers of chambers, which are formed of as many turns of an inclined plane in a vertical spire; covered externally by a thin incrustation, through which the chambers may be seen with a magnifying glass of low power. Chambers arranged in *continuous* spiral rows, extending from the centre to the circumference, and increasing in number outwards (fig. 2); alternate in adjoining rows, small in the centre, largest towards the circumference, and in the superficial layer on both sides, where they are oblong or ovoid vertically (fig. 4); each presenting two round apertures communicating with the next outer and inner chambers; the outer aperture of the external row opening on the margin (fig. 3). Septa straight, (and being perpendicular to the, and alternate in adjoining, rows of chambers,) forming *broken* spiral lines running in the opposite direction to them, so as to present the linear appearance seen on the case of an engine-turned watch (fig. 2); but with the exception, that in the former the lines increase in number outwards by the addition of more rows of chambers on the one hand, and more septa on the other, just as in *Orbitoides*. D'Orbigny's "coupe horizontale," therefore, of the latter (Cours élément. de Paléont. et Géol. vol. ii. p. 193)

is not correct, for that is identical with the lines on the back of an engine-turned watch.

Locality.—Abounding in an impure, bluish-green argillaceous limestone (of the Pleiocene of formations?) about 30 feet beneath the surface at Cochin on the Malabar coast, the shells of which, though deprived of their animal matter, are still white and pulverulent, or semi-crystalline.

Observations.—In the foregoing paper, p. 129, I have stated, that “D’Orbigny is not warranted in giving the distinguishing character of concentricity to the rows of chambers in his order *Cyclostègues*, for in his three first genera, which are all alike in this respect, we have seen that it is almost impossible to determine it; and in his last one, of which *Lycophris dispansus* is a type, it is evident that this is not the case, but that the chambers are arranged subspirally.”

I had always been impressed with the idea that a spiral arrangement of the chambers was the most persisting character in the discoidal Foraminifera, and although I had succeeded in demonstrating this in *Orbitoides* (*loc. cit.*), I could not do so in the other genera of D’Orbigny’s *Cyclostègues*, from the smallness of the cells and their confusion in the centre of the species I possessed. In the one just described, however, there is no doubt of it. The lines of chambers are thrown off from a vertical spire, in the form of sparks from a rotatory fire-work, as I have before stated of *Orbitoides*; and, if it be the case in one species of *Orbitolites*, it is most probably the case in all, and in D’Orbigny’s genus *Orbitolina*, also, which is but an extended form of the same structural foundation.

Hence if this reasoning be allowed, it must follow, that D’Orbigny’s term for this order is a misnomer, for the chambers are not arranged in concentric circles as it would imply, but *spirally*, as in other discoidal Foraminifera.

I have named this species *Orbitolites Malabarica* from its locality, the specific differences between it and the other known species (with the exception of the spiral lines on the surface) not being recognizable by the unassisted eye.

Identity of Lamarck’s genus Orbitolites and D’Orbigny’s Cyclolina. There appears to me to be very little difference between Lamarck’s genus *Orbitolites* and D’Orbigny’s *Cyclolina*, judging from the figures of the former, in tab. 73. figs. 13-16, of Lamouroux’s ‘Exposition Méthodique des Polypiers,’ and of the latter, in tab. xxi. figs. 22-25, of D’Orbigny’s ‘Foramen. Foss. du Bassin Tert. de Vienne.’ Both are marginoporous, and both without pores on the surface (see Carpenter,

Quart. Geol. Journ. vi. p. 31) ; while the concentric circles represented in D'Orbigny's *Cyclolina cretacea* (*loc. cit.*) find their parallel also in Lamarck's *Orbitolites concava*. Carrying out this reasoning also, we find it stated by Dr. Carpenter (*loc. cit.*) respecting the Australian species of Quoy and Gaimard and *Orbitolites complanata*, that they "agree closely in every particular save the form of the superficial cells"; and as the former and *Orbitolites Malabarica* will be seen to be still more intimately allied, it also follows, that all these species should come under the genus *Orbitolites* of Lamarck. The chambers I apprehend are arranged spirally in all, though the superficial lines only appear to be so in *O. Malabarica*.

It therefore seems to me (though of course I make these remarks with much deference) that D'Orbigny's genus *Cyclolina* should be a species in Lamarck's *Orbitolites*; then the latter genus would be characterized by a thin amorphous incrustation on the surface through which the chambers are more or less visible with a magnifying glass; and in D'Orbigny's *Orbitolina*, the incrustation would be characterized by its cellular structure, as in *Orbitoides*, rendering the species or varieties more or less convex on one or both sides. In this case the species in the foregoing paper, called respectively *Orbitolites* and *Cyclolina*, should be named *Orbitolina* and *Orbitolites*.*

EXPLANATION OF PLATE II., A.

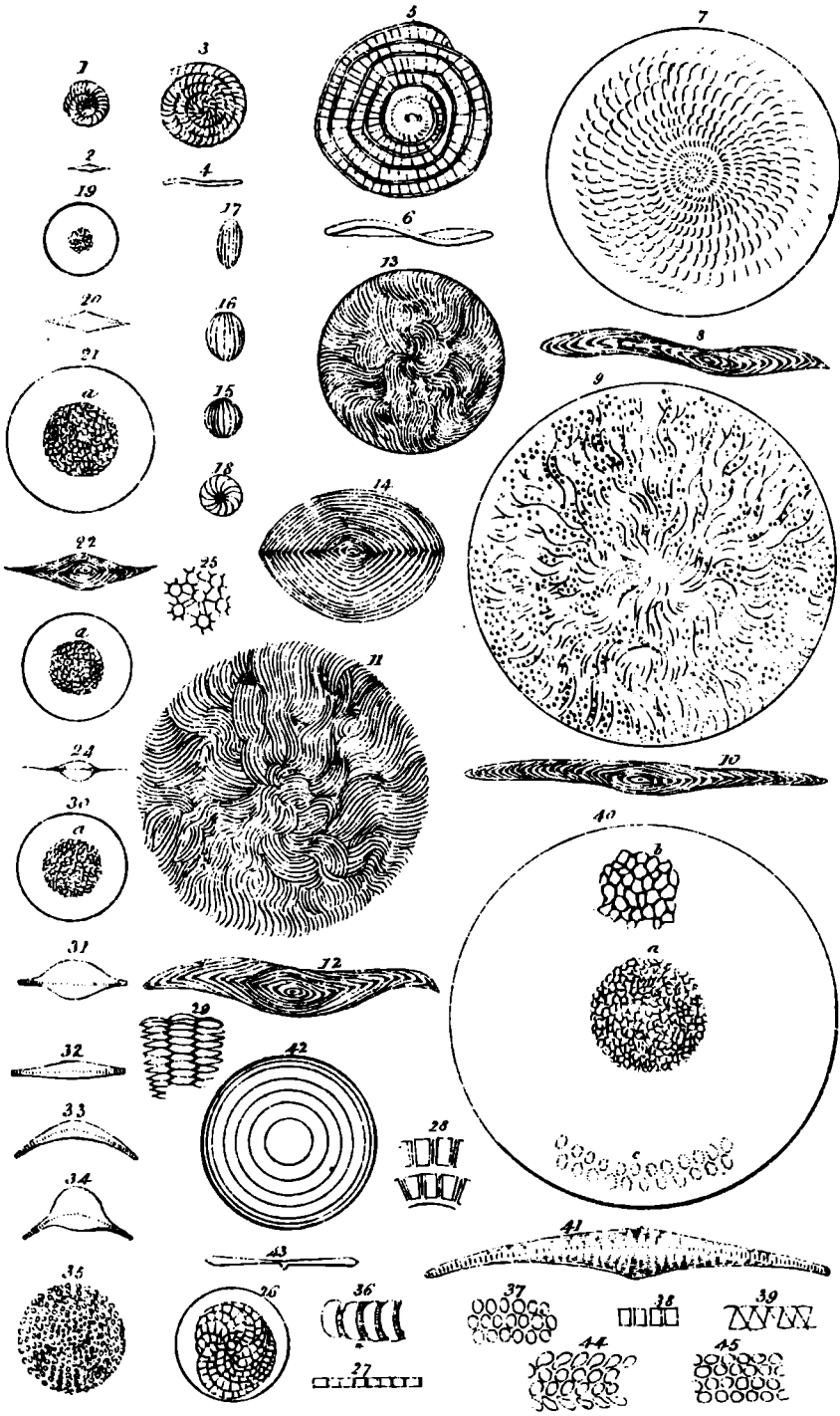
Fig. 1. *Orbitolites Malabarica*, natural size.

Fig. 2. Portion of the centre magnified, showing the spiral arrangement of the chambers.

Fig. 3. Portion of the margin magnified, showing the marginal apertures.

Fig. 4. Portion of the internal, or opposite, side of the rows of chambers, showing similar apertures;—also the large oblong or ovoid chambers of the surface.

* This and the foregoing Articles, together with Art. V. p. 430, vol. iv. have, with slight and unimportant alteration, been reprinted from the "Annals and Magazine of Natural History," on account of their local as well as general bearing.



A



ART. X.—*Note on an apparently new genus of Gasteropod.* By
A. H. LEITH, Esq., M.D.

Presented 17th March 1853.

THIS minute Mollusk is met with on the shores of the island of Bombay, by the edges of salt-water pools, moving on the moist earth or rocks, and taking shelter under stones. Its chief peculiarity is having an operculum, together with two eye-tipped tentacles.

The Animal has a broad, short foot, a head expanded into a broad and slightly emarginated lip, used as a fore-foot, only two tentacles, which are short, nearly cylindrical, contractile, and bearing the eyes on their summits. The respiratory opening is a round perforation in the mantle, behind the right tentacle.

Operculum is horny, with subspiral lines, running from a nucleus near the columella.

Shell sub-umbilicated, with an elevated spire; aperture rounded below, and at the summit angular; peristome edged, at base effuse, lips united by callus, which encroaches on, or even covers the umbilicus.

Believing that this genus is new, it is proposed to call it *OPTEDICEROS*, with reference to its two eye-bearing tentacles.

Three species have been found, of which the shells may be thus described:—

1, *Optediceros corneum*.—Ovato-conical, with 6 rounded whorls, longitudinally striated; colour greenish-horny; length 0·22 inch.

2, *O. subconicum*.—Subconical, with 7 or 8 somewhat flattened, smooth whorls; colour ochrey or orange; length 0·2 inch.

3, *O. marginatum*.—Ovate, with pointed spire, 6 whorls, marked with faint striæ of increase; slightly margined below the sutures; colour ochrey; length 0·2 inch.

Observations.—In each of the first two species the animal is grey, and its lip is subcrescentic, while in the last the colour is scarlet, and the lip is rectangular. In *O. marginatum* reptation is slower than in

the other two species. If put into salt water, they all quickly make their escape from it, by creeping up the sides of the vessel, but if placed in fresh water, they close their opercula, and remain shut up until they die.

ART. XI.—*On a Fossil Fish from the Table-land of the Deccan, in the Peninsula of India.* By Colonel SYKES, F.R.S., G.S. *With a Description of the Specimens.* By Sir P. DE M. G. EGERTON, F.R.S., G.S. [*Extracted from the Quarterly Journal of the Geological Society of London.*]*

GENERAL FRASER, the British Minister at the Court of the Nizam at Hyderabad, in a letter to me dated the 31st July 1850, mentioned his having transmitted some specimens of fossil fish, with impressions of leaves, in a matrix which Dr. Walker, whom General Fraser had employed in Statistical and Natural History researches in the Nizam's territories, considered as appertaining to a coal-formation. General Fraser had previously caused specimens to be sent to the Asiatic Society of Calcutta; but the reports upon them not satisfying Dr. Walker, a second series of the specimens were sent to me by General Fraser, with a request that I would ascertain their possible relations with true coal-strata.

Considering the enormous development of trap, covering some 200,000 square miles in the Deccan,—the granitic basis of the whole peninsula of India,—the area occupied by laterite,—the want of sedimentary rocks,—and the hitherto total absence of organic marine fossils in the Deccan (for a few shells brought to notice by the late Dr. Malcolmson were either fluviatile or lacustrine),—the discovery of fossil fish on the margin of the trap region was a novelty necessarily of great interest, as indicative of the former submerged state of the peninsula of India. The fossils arrived in October last, and a glance showed that the remains were imbedded in bituminous schist. The specimens were met with, General Fraser mentioned, near to the confluence of Wurda and Godavery rivers, north of Hyderabad, and south of Nag-

* Vol. vii. Part I. p. 272.

poor. But as the Wurda runs into the Wein Gunga, and the latter runs into the Godavery, General Fraser probably meant the confluence of the Godavery and the Wein Gunga. The junction of the Wurda and Wein Gunga is about 170 miles north-easterly from Hyderabad, in latitude $19^{\circ} 87' N.$, and longitude $79^{\circ} 50'$, and the junction of the Wein Gunga and Godavery is about 115 miles north-easterly from Hyderabad, in latitude $18^{\circ} 49' 30'' N.$, and longitude $79^{\circ} 56' 30''$. I have reason to believe these localities to be from 1200 to 1400 feet above the sea-level.

The Curator of the Geological Society inspected the specimens of fossil fish, and he considered that they belong to a genus which in European latitudes is usually associated with the Oolitic formation. The Oolitic rock nearest to the locality of these fossils is in Cutch, fully 1,000 miles distant, and with a thickness of from 4,000 to 5,000 feet of trap intervening for a couple of hundred miles; nevertheless many of the European associates of oolite exist upon the Wurda and Godavery, namely, bituminous shale, wood-opal, calcareous spar, rhomboidal quartz, agates, chalcedony, hornstone, &c., and the rock itself may be overlaid by the prodigious flow of trap. It was not until the arrival in town recently of my friend Sir Philip Egerton, whose acumen and critical knowledge of fossil ichthyology render his opinion so valuable, that I was enabled to get the specimens examined with deliberate attention. But Sir Philip, with that readiness which makes him at all times anxious to render his knowledge available to others, instantly responded to my appeal, and I am permitted by him to make use in his own words of the conclusion at which he arrived after an examination of the fossils. He says:—

“The specimens with one exception are much broken, and the materials scattered confusedly over the schist; but there is sufficient evidence to show that they are all referable to the genus *Lepidotus*, and, most probably, all to one and the same species, *that being a new one*. It is remarkable for the slender proportions of the anterior part of the trunk, and the thickness of the posterior part between the anal fin and the tail. The scales are perfectly smooth, and the free posterior margins entire, without any trace of serration. A ramus of the lower jaw is seen on one specimen, showing the teeth to be conical, with rather elongated bases. There is little doubt but that it is a true Oolitic form, and apparently of the date of the Lias. The schist in which the fish are imbedded reminds me strongly of the bituminous shales of the Lias of Seefeld in the Tyrol. It is very desirable that more perfect

specimens should be obtained, since the only one showing the form of the fish wants the head, and exhibits only the under surface of the scales."

In a second note Sir Philip adds :—" The genus *Lepidotus* extends from the Lias to the Chalk, both inclusive ; but your species bears evidence of being one of the earlier members of the race. It was probably an estuary or in-shore fish, from its frequent association with terrestrial vegetable remains, as in the Hyderabad specimens."

Sir Philip Egerton has so ably and completely exhausted the subject as far as the specimens permitted, that it only remains to me to name the new fish ; and as it was very much my practice in my Natural History investigations to associate new species with the localities or provinces where they were met with, I would propose to call the specimen *Lepidotus Deccanensis*.

I have written to India for more specimens, but as the discoverer, Dr. Walker, has lately unhappily lost his life by a fall from his horse, I am not very sanguine about their receipt.

ART. XII.—*Postscript to the "Geology of the Nagpur State."*
By the Rev. S. HISLOP.

Received 2nd August 1853.

It has been assumed in my paper on the Geology of the Nagpur State, that the Eocene deposit is co-extensive with the former of these formations. This, I think, will be admitted, when it is considered, that there are many out-crops in Western India described as of "red bole" by Newbold, and "red ochreous rock," "pulverulent limestone," and "mesotype" by Sykes, which, though not fossiliferous, really present examples of our freshwater strata. The trap, then, overlying, as it does, a lacustrine formation, must have been poured forth in an

immense lake, or chain of lakes, it may be, similar to those of the North American Continent; and, therefore, the idea of a submarine effusion is wholly groundless. But how, then, it may be asked, are we to account for the flatness of the trap hills? Must they not have been consolidated under great pressure? The vicinity of Nagpur supplies the answer. Nowhere are the outlines of the hill tops more horizontal than in Central India; and yet, judging from the abundance of pulmoniferous mollusca which are there found, the freshwater in which they lived, and in which the igneous rock was afterwards spread out, must have been so shallow as to allow the molten mass to appear above the surface of the lake in the atmosphere.

Again, it has been taken for granted, that the plants figured on the last plate of McClelland's Survey for 1848-49 are, as there stated, fucoids. Though I have thought it right, from not having seen the specimens themselves, to reason on this hypothesis, yet I am of opinion, from the figures which he has given, that his so called *Fucoides venosus* is nothing but a *Glossopteris*; and that, consequently, there is no proof whatever of the Bengal coal measures having been deposited in the sea, but every likelihood of their having been formed in fresh water. The same may be said of the shale at Kotá, on the banks of the Pránhítá, where the *Lepidotus Deccanensis* was found. This genus of fishes is, indeed, as frequently met with in marine as in freshwater formations; but from the impression of a bivalve, left on a fragment of the shell kindly sent me with scales of the *Lepidotus* by Dr. T. L. Bell, who has already thrown much light on the geology of the Nizam's country, I am inclined to believe that the shells will show the strata to be lacustrine. Combining this conclusion, then, with other premises previously established, the deduction from the whole seems to be, that the ocean has not swept over the Deccan since the commencement of the Oolitic series in India.

Recapitulation of the leading propositions illustrated in the preceding Paper and Postscript.—1st.—The Regur appears to be the product of decayed vegetation, accumulated in marshy situations, or under a humid atmosphere. 2nd.—The Laterite is probably caused by ferruginous matter diffused over the *debris* of any kind of rock, whether igneous or sedimentary. 3rd.—The Overlying Trap of Central and Western India cannot have been poured out in the bed of the ocean, but must have been erupted in a lake or chain of lakes, and consolidated in general under no greater than an aerial pressure. 4th.—The Freshwater Formation under this Trap,

in so many localities of the region just named, is obviously of the Eocene period. *5th*.—The Sandstone of Central India, which appears to be identical with the Diamond Sandstone of Southern India, belongs, with its associated Shale, and the India Coal Measures, to the Lower Oolitic Formation. *6th*.—The first mentioned of these rocks is of freshwater origin, and so, there is reason to believe, are also the others. *7th*.—The Deccan exhibits no evidence of having been submerged by the ocean since a period anterior to the Oolite.

Errata.

Page 59, lines 18, 19,	for "first, fruit, an" read "first-fruit and"
" 62, line	17, for "Bithenia," read "Bithinia,"
" " "	33, for "Khanari" read "Khánáni"
" 63, "	24, for "Weirásad," read "Weiragad,"
" 64, "	5, for "Shek Jarid," read "Shek Farid,"
" " "	13, for "these" read "the"
" 66, "	8, for "Chonki," read "Chouki,"
" 60, "	30, for "Brown," read "Bronn,"
" 71, "	4, for "Koohádi" read "Korhádi"
" " "	20, delete "endate at the base, and"
" " "	38, " " after "rows"