ASIATICK RESEARCHES;
OR,
TRANSACTIONS
OF THE
SOCIETY
INSTITUTED IN BENGAL,
FOR ENQUIRING INTO THE
HISTORY AND ANTIQUITIES, THE
ARTS, SCIENCES, AND
LITERATURE,
OF
ASIA.

VOLUME THE SIXTH.

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Printed by Rousseau, Cold-Bath-Fields; Bunney and Gold, Shoe-Lane; Wilson, Wild-Court; Cundee, Ivy-Lane; Maiden, Sherbourne-Lane; and Swan, Gracechurch-Street.
THE ASIATICK SOCIETY, having resolved to give, with each subsequent Volume of their researches, a list of such Oriental Subjects as require farther illustration; have selected for the present, and hereby invite communications on the following

DESIDERATA.

RELIGION, POLICY, JURISPRUDENCE, MANNERS AND CUSTOMS.

An accurate description of the different festivals and fasts prevalent in India, together with an investigation of their origin, and of the reason and signification of their peculiar ceremonies.

As those are very numerous, the following are specified as objects of primary inquiry,

Among the Hindus.

DOORGA Pooja, or Dusserah,
KALEE Pooja, or Dewalee,
JONMON ASHTOMEE,
CHURKH Pooja,

Account
Account of the pilgrimage to the temple of Jagarnath, at Purjotom.

Among the Musulmans.

Eed ul Zoha,
Eed ul Fetr,
Eed Chudeer,

2. An enumeration of the different castes of Hindus, with the customs peculiar to each; as existing in the present time.—See an enumeration from the ancient Sinfrit records, Asiatick Researches, Vol. V. p. 53.

3. A connected history of the several Musulman tribes, existing in India.

Among these, an account of the singular tribe known by the name of Bohra, is particularly required.

4. What kinds of oaths are considered as peculiarly binding by the different tribes and sects in Hindustan?

5. What historical monuments remain of the government, and the system of police, which obtained in Hindustan, previously to the Musulman invasion?

II. GEOGRAPHY.

1. A catalogue of the names of Towns, Countries, Provinces, Rivers, and Mountains, from the Shasters and Purânas, with their modern names annexed; and a correct list, according to the oriental orthography, of the Towns, &c. mentioned by Major Rennell, and other European Geographers. The etymology, as far as practicable, would also be desirable.

2. What were the geographical and political divisions of the country before the Musulman invasion?

III. BIOGRAPHY.

1. Accurate translations of the accounts given of the life and actions of Bouddha, by the priests of his sect.

2. To
2. To enquire if there be any accounts remaining of Chauchasan, Gonagom, and Gaspa; whom the Burmas represent as having preceded Godama.

3. The history of Mahamoony, a disciple, or follower of Godama, to whom, also, adoration is paid, by many among the worshippers of Bouddha.

4. A History of those saints, philosophers, &c. either male or female, who have become famous, in modern times among the nations and religious sects that inhabit India.

IV. COMMERCE, NATURAL HISTORY, MATERIA MEDICA.

1. To inquire into the state of the commerce of India, previously to the first settlement of Europeans.

2. To ascertain the different trees which produce Gamboge, or a gum-resin resembling it; to investigate the qualities of the drug, as produced from each of those trees, among which we may reckon the following:

   Cambogia Gutta. Lin.
   Garcinia Celebica. Lin.
   Stalagmites Cambogiodes. Koen.
   Hypericum Pomiferium. Rox.

   To procure accurate figures of the Stalagmites Cambogiodes, or the Ceylon tree, and of the tree which yields this drug in Cambodia. Lastly, to determine whether all these trees may not be referred to one Genus.

3. To ascertain from what country the root commonly called Columbo is procured; and to give a botanical description and figure of the plant to which it belongs.

4. The botanical names of plants mentioned in the Hindu books of Materia Medica.

5. To supply the deficiencies which remain in the accounts of the production of Borax, in the neighbourbood
bourhood of Tibet and Nepal, as delivered by Mr. Blane and Father Joseph de Ravato, in the Philosophical Transactions, vol. 2. 77.

6. Whether the Tobacco plant was known in Asia, before the discovery of America; and whether the edicts said to have been published by Aurungzebe, against the use of that plant, be authentic?

V. MEDICINE AND SURGERY.

1. History of that peculiar inflammation of the Schneiderian membrane, termed Nakra, with the mode of treatment by the natives.

2. History of inoculation for the Small-Pox, among the Hindus.

3. Antiquity of the venereal disease in India, and the knowledge which the ancient Hindu physicians had of its cure.

4. Their treatment of the Leprosy; with some account of the different species of that disease, which are met with among the natives of India.

5. How long have the natives possessed the art of couching for a cataract, and from what source did they obtain it?

VI. LANGUAGE, LITERATURE.

1. How many dialects are there of the Hinduwee, i.e. of languages connected with the Sanscrit; and in what parts of India were they, or are they spoken?

2. What general term had the natives of India before the Musulman invasion, to designate what we imply by the term Hindu?

3. To obtain as full a catalogue as possible, of books in the Sanscrit and other Hinduwee languages; containing the following particulars, as far as they can be ascertained, viz. the names of the authors, the subjects, the dates, the age of the most ancient manuscript of each now known to exist; and the places where the books are now to be found.

I. A DIS:
Gentlemen,

If I commence with diffidence and timidity the duties of an office to which your suffrages have advanced me, it is not merely because I consider the objects of our researches, as by their extent difficult to be comprehended, or by their variety difficult to be methodized; for obstacles like these will only be encountered by me in common with you, and if they are encountered with vigour, they may be surmounted by diligence.

My fears proceed from discouragements peculiar to myself. He who sits in this chair is exposed to censure not only by his own defects, but by the virtues of his predecessors. I am to superintend the inquiries and preside at the meetings of this learned Society, in the place successively vacated by two Presidents, not
only equally eminent for extent of learning and elegance of diction, for strength of comprehension and clearness of explanation, but also equally devoted from their early youth to Oriental studies.

With Sir William Jones, who may not improperly be called the father, as well as first President of this Society, I deem myself happy to have become acquainted when he entered the university, a boy just come from school. I had then many opportunities to observe the wonderful progress which he had already made in the ancient Languages of Europe; of which let one instance suffice. He had composed, and brought with him to Oxford a comedy written in Greek verse, of the poetical powers whereof I will not now venture to speak: he himself appears not to have thought very highly of it in that respect. He considered with Horace, that

"Membranis intus positis, delere licebit
"Quod non edideris,"

and in fact he never did publish it. But the verification afforded a wonderful example of diligence and accuracy, of exuberance of style, and power of expression in Greek. It comprised all the different kinds of metre which are to be found in the dramatick writings of Greece; and Doctor Thomas Somner of Harrow, the best judge of the subject perhaps then in England, declared after reading it, that it did not contain one metrical error.

Within a very few years after this, and while the most laborious student I ever knew was still in his minority, both legal and academical, an undergraduate in the University, and considerably under the age which the law calls the age of discretion, the casual sight of a folio volume filled with extracts from Arabick manuscripts afforded me an opportunity of learning that he had filled (in all) four such volumes with similar extracts, made with his own hand in the Bodleian library,
library, where, though an undergraduate, he was by special favour permitted to study. Many of these extracts were probably made from manuscripts of which no other copies are known to be extant; and it is certain that all of them were transcribed from books, which, according to the laws of that library, could not be carried out of it. Had they been left rare and more accessible, they would hardly have been transcribed by Sir William Jones at the expense of so much time as they required, for I have reason to believe that, in his own opinion, their intrinsic merit was not very great. I have mentioned these facts because they are not generally known; but as I do not mean to pronounce an eulogy on Sir William Jones, nor to attempt even the slightest sketch of his life and writings, I shall not dwell on the extraordinary diligence with which he laboured in the mines of jurisprudence, at the same time that he pursued the study of Oriental learning; neither shall I enter upon a critical examination of the voluminous and convincing proofs he gave the public of his pre-eminence in both. I shall content myself with observing that if ever the English settlements in India shall add, to the splendor of their prosperity in commerce and war, the honour and pride of having, beyond all former example, communicated to Europe the wisdom and learning of Asia, for that well-earned honour, that just principle of honest pride, they must own themselves indebted to Sir William Jones.

For my first acquaintance with Sir John Shore, considerably more than twenty years ago, I was obliged to my late brother William Chambers, afterwards a very worthy and respectable member of this Society, and I believe much beloved by all who knew him. Mr. Shore and he were then very young servants of the East India Company, of congenial minds, and attached to each other by similarity of studies and pursuits, having both in making their choice of life pitched upon the study of Asiatick languages; as the mode in
they could serve the Company with most honour and advantage to their employers and themselves. I may, I believe, venture confidently to add, that the *East India* Company had not at that time any two servants so young and so well acquainted (at the same time) with the languages and learning of *Asia*, and particularly with the *Persian* tongue and the authors who have written in it. Pardon, Gentlemen, this mention of a much loved and much lamented brother, to which I have been tempted by the pleasure of uniting his name with that of our late much honoured President.

Soon after the time of which I have spoken, my brother, led by motives of private convenience, took himself to an humble course of life, in which he palled his days with more utility than lustre, but without ever deserting his favourite studies, till it pleased the Almighty that he should rest from his labours. Mr. Shore with that conscientiousness which every great mind has of its own powers, was not content merely to persevere with assiduity in his attention to *Persian* literature, but applied himself at the same time to every science and every part of knowledge which might qualify him for the most important and splendid offices in the *British* dominions in *Asia*. He became eminent for his minute acquaintance with the revenues of *Bengal*, as well as for his general skill in finance; for his knowledge of the politicks of *India* in particular, as well as of the science of Government in general; and no one was surprized when after visiting his native country, he returned to *Bengal* as Sir John Shore, the destined successor of Lord Cornwallis.

To speak of his conduct since he became Governor General, would be unbecoming, because presumptuous, and is totally unnecessary, because almost every member of this Society is as well acquainted with his merits as I can be. I mention him as Governor General only because while in that station he accepted the office
of our President, and proved to us by his own example, that neither the cares of Government, nor the multifarious duties of a Governor General, are inconsistent with a very considerable and useful degree of attention to Asiatick researches.

Such have been the two former Presidents of the Asiatick Society. That by the choice of this learned assembly I am called into the place which they have vacated, as it depresses my hopes, so it must excite my diligence. Abilities no man has the power of conferring on himself, but fidelity and industry are always attainable.

When some respectable members of this Society first mentioned to me their own wish and that of others that I should succeed Sir John Shore in this chair, I told them, with great frankness and sincerity, that I did not think I had either health, or leisure, or ability to perform as I could with the duties of the office; and particularly, that I thought myself deficient in one attainment which might be expected in a President, in as much as I have but a slight and superficial knowledge of any Asiatick language. Some qualifications for the presidency the partiality of friendship may perhaps discover in me, and these, whatever they may be, shall be devoted, as far as health and freedom from business will permit, to the purposes of the Society. If it is now too late, at the age of sixty, greatly to increase my own stock of Oriental literature, I will at least endeavour to promote the increase of it in others.

"Et fungar vice cotis; acutum
" Reddere quae ferrum valet, exors ipse secandi."

A 3  II. NAR-
II.

NARRATIVE of a JOURNEY from AGRA to OUJEIN.

By WILLIAM HUNTER, Esq.

BEFORE entering on the following narrative, it will be proper to detail some of the principal circumstances which led to the journey. That is the subject of it, About the month of September 1790, SINDIAH, who was engaged in a war with the Rajahs of Jayanagar and Joudhpoor, but had, for about two years, remained quiet at Matra, and confided the operations of the campaign to his generals, thought it expedient (although his arms had lately been crowned with signal success, at Meeriah, were the whole force of Joudhpoor was, with great slaughter, overthrown) to take the field in person.

When his intention was certainly known, Major Palmer, the English resident at his court, who was then at Agra, offered to accompany him on the expedition. He replied, that as he expected to return soon, he was unwilling to put the resident to an unnecessary inconvenience. SINDIAH directed his course towards Jayanagar, which being destitute of the means of defence, and governed by a prince, young, unexperienced, devoted to pleasure, incapable of serious attention, and irresolute in his councils, was thrown into the greatest consternation. The Rajah and his ally of Joudhpoor gladly submitted to any conditions of peace that SINDIAH thought proper to dictate. They agreed to pay a heavy fine, and a considerable annual tribute; and they ceded the fortress and district of Ajimere, which had been surrendered to them, in a treacherous, or cowardly manner, during the war, by the officer to whom SINDIAH intrusted their defence.

A 4

Having
Having brought this affair to a happy conclusion, Sindiah marched to Ajimere, where he was joined by his army from Joudhpoor. Here he had not remained long, before he was invited, by the Rana of Oudipoor, to assist him in recovering his authority, and in reducing to obedience Bheem Sing, the governor of the fortress of Cheitore, who had thrown off his allegiance, and was in arms against his sovereign. The Rajah of Oudipoor, is looked on as the head of all the Rajpoot tribes, and has the title of Rana by way of pre-eminence. His family is also regarded with high respect by the Musulmans themselves, in consequence of a curious tradition, relating to his genealogy. He is said to be descended, in the female line, from the celebrated Anushirwan, who was king of Persia at the birth of Mohammed; and thus to have, in that line, a common origin with the Seids descended from Hussein, the son of Ali. The circumstance is remarkable, and is certainly worthy of a careful investigation. For, if admitted, it proves so close an intercourse to have existed, at that time, between the natives of India, and the neighbouring Pagan nations, as, compared with the ancient prohibition of the intermixture of different casts, to establish the existing traces of a common origin.

But the Rana, though the first in dignity, is inferior in power, to the Rajahs of Jayanagar and Joudhpoor: and the strength of the fortress of Cheitore, which is situated on a high and rugged mountain, encouraged Bheem Sing, one of his most powerful vassals, to throw off the yoke of subjection.

Sindiah readily accepted the invitation, and proceeded to Cheitore, where he was met by the Rana. He invested the fort; and although his progress, against a place of such strength, was necessarily slow, he at length reduced Bheem Sing to such straights, that he surrendered the fort, and submitted himself to the
the Rana. Sindiah at first put a garrison into the fort, but soon after, delivered it over to the Rana, in pursuance of their previous agreement.

After remaining here some time, Sindiah determined, instead of returning to Mathra, to proceed farther southward. A variety of motives has been assigned for this journey, which terminated in his death, and probably contributed to accelerate that event. The measure was liable to strong objections; and no difficulties were spared, on the part of Rana Khan, one of Sindiah's oldest counsellors, and most faithful servants; perhaps the only one who followed his fortunes from pure personal attachment; conscious of which, the prince always honoured him with the appellation of brother. The recent conquests in Hindustan were still in a very unsettled state; the stipulated tribute from the Rajahs of Jayanagar and Joudhpore was yet unpaid, and those chiefs would gladly have seized any opportunity of evading the performance of their compact; in which attempt, they might expect to be well supported by their warlike Rajpoots, who burned with impatience to shake off the galling yoke of the Mahrattas. The northern and western frontiers lay exposed to the annual incursions of the Sikhs, who might be encouraged, by the absence of the chief, to acts of greater audacity. Lastly, the jealousy entertained, by the Poona government, of the great accession of power, which had accrued to Sindiah, from the conquest of Hindustan, was no secret; and the auxiliaries, that under the command of Holcar and Ali Bahadur, were sent him, by that court, when he was pressed by a combination of the Rajpoot, Mogul, and Afghan forces, were now become, at least suspicious friends, if not secret and domestic foes, envious of his exaltation, and willing to embrace any occasion of aggrandizing themselves, at his expense.

On the other hand, he probably conceived, that while the tranquillity of his possessions in Hindustan would
would be sufficiently secured, by committing them to the protection of the same armies, by which they had been acquired, under the command of the leaders who had hitherto conducted those armies to victory; some important advantages were to be obtained by his presence at Poona. He hoped, by establishing an influence in that court, to obtain an order for the recall of Holcar and Ali Bahadur, and thus to be left in sole possession of the new conquests. As the expense of making and maintaining those conquests, in the name as he pretended, and on behalf of the Peshwa, had greatly exceeded the revenues derived from them, he hoped to receive, from the treasury of Poona, the balance, which, on a comparison of accounts, was allowed to be eight crores of rupees. Lastly, as his paternal estate in the Decan was destitute of strong places, he was desirous of obtaining a grant of some fortresses adjoining to it, for the security of his family and possessions. These were the principal heads insisted on, in his negociations with the court of Poona; and his hopes of establishing an influence there (besides what he might expect from the gratitude of the Peshwa and of Nana Pharnawees, one of whom owed the sovereignty, and the other his office of prime minister, in a great degree, to Sindeah's exertions, were founded on the respectable force by which he was attended; sufficient to awe the government, and make it afraid to disoblige him. For the rest, he trusted to his own address, in flattering the vanity, and amusing the juvenile levity of the Peshwa, so as to create, in his mind, a personal attachment, towards himself.

Besides these grand objects, he had others in view, of a subordinate nature. He had been fourteen years absent from Onjein, the capital of his jageer; and, many complaints having reached him, of mal-administration, on the part of those entrusted with authority there, his presence became necessary, for the rectification of abuses.
To these political motives, were added the calls of superstition, to which this chief, though in other respects possessing a vigorous mind, and an enlightened understanding, seems to have ever lent a willing ear. Though born and educated in the Hindu religion, and scrupulously observant of all the usages which it enjoins; he shewed a great complaisance towards the institutions of Mahommed. And here, by the way, we may observe, that these two religions have existed together in Hindustan, for so long a time, the professors of both have acquired a habit of looking on each other with an eye of indulgence, unusual in other countries, between those who maintain such opposite tenets. Thus, the Hindu is often seen to vie with the disciple of Ali, in his demonstrations of grief for the fate of the two martyrred sons of that apostle; and in the splendor of the pageant annually exhibited in their commemoration. He pays a respect to the holidays prescribed by the Koran, or set apart for the remembrance of remarkable events in the life of the prophet or his apostles. This degree of complaisance is perhaps not surprising in the disciple of Brahma, whose maxim is, that the various modes of worship, practised by the different nations of the earth, spring alike from the deity, and are equally acceptable to him. But, even they who follow the intolerant doctrines of the Koran, are no longer those furious and sanguinary zealots, who, in the name of God and his prophet, marked their course with desolation and slaughter, demolishing the Hindu temples, and erecting mosques on their ruins. They found the patient constancy of the Hindu superior to their violence; that the fear of torments and of death was unable to make him desert the tenets which his ancestors had handed down to him, from an unfathomable antiquity; but, that if left in the quiet possession of these, he was a peaceable, industrious, and valuable subject. Accordingly, we observe among the Musulmans of Hindustan, a great deference for the prejudices of their neighbours or dependants, of the Hindu persuasion. Particularly, in the
the holly or saturnalia of India, when liberty of speech and action towards superiors, are allowed to as great an extent, as among the ancient Romans; the Musulmans are seen to enter into the diversion, with as much alacrity as the Hindus themselves.

Thus, the Mahratta prince was not altogether singular in the attempt to unite the observance of both religions; but, his complaisance, in this respect, was certainly carried to an unusual length; which is accounted for in the following manner. Shah Munsoor, a Musulman fakeer, who pretended to the gift of prophecy, being consulted by Sindiah, foretold his future greatness; saying, "Go, I have given you the country, as far as Dehly." Such a prediction, addressed to a mind so ambitious, so persevering in the attainment of any object once proposed to itself, and so strongly tainted with superstition, may have been very instrumental in bringing about its own accomplishment. However this may be, it was fully verified; and Sindiah naturally looked on the memory of the Shah with great veneration. He kept his disciple and successor, Hubeed Shah, constantly about his person, assigned him a jageer and a numerous retinue, and daily performed the ceremony of prostration before him, and of kissing his feet. Shah Munsoor was buried at Beer, a place in the Nizam's dominions, and Hubeed Shah had frequently urged Sindiah to visit the tomb of that saint. Several circumstances contributed at this time, to give weight to his advice. Besides the veneration Sindiah had for the prophet of his greatness, and the efficacy he might ascribe to such a pilgrimage, in promoting the future success of his affairs; he was anxious for a son, to be the heir of his fortunes, and hoped to obtain this boon, by his devotion at the holy shrine. One of his favourite wives, also, was lingering under a fatal distemper, and she imagined that the influence of the holy man's ashes afforded the only prospect of relief.
From Chitore, he accordingly marched to Oujem, and finding that city exposed to frequent robberies, and other disorders, from the neglect of justice; for the exercise of which, the persons intrusted with the administration pretended they had not a sufficient force; he gave the police and judiciary power in charge to one of his own confidential servants, whom he supported with a body of soldiers; leaving the management of the revenue in the hands of the former collectors. After staying twenty-three days, he continued his march.

These transactions occupied the space of a year and five months; at which time, in consequence of Sindiah's application for that purpose, Major Palmer received orders to join him. He determined to proceed by the way of Gualior, though a circuitous road, because it lies through countries where Sindiah's passes would be respected.

On the 23d of February 1792, we marched from Agra to Baad, a small village, lying S 25 W distant in a straight line ten and a half British miles. The road lay through a fertile and well-cultivated country, interspersed with clumps of mango (Magnifera Indica), Neem (Melica Azadiracht), and wild date (Elate Sylvestris.)

Feb. 24.—Marched to Munmiah, S 13 W 16,8 miles. This is an inconsiderable village. On the march, we crossed two rivers, the Utingen and Ban-Gunga. On the banks of the latter stands Jahjow, where there is a handsome ferry, built of stone. This village is rendered famous by two decisive actions, fought on nearly the same spot, close to it. The first, on the 7th of Ramazan, A. H. 1068, or June 8, 1658 N. W. wherein Aurungzere totally defeated his brother Dara Shekoh; and the second, in the year 1119, between the two sons of Aurungzere, Shah Aalum,
AALUM, and AZEM SHAH, in which the latter was slain, and left to his brother undisputed possession of the Indian empire.

Feb. 25.—MARCHED S 12 W 6,2 miles, to Dholpoor, a pretty large town, situated within a mile of the river Chumbul, on the banks of which is a fort, of the same name with the town. The hilly country begins at this place. One remarkable conical hill, near the town, has on the top of it, a tomb, surrounded with a stone wall. The lower part of the hill is composed of a reddish Schistus, and the upper of free-stone.

Feb. 26.—MARCHED to Choola-Seray. The distance in a straight line is only 5,8 miles, S 33 E; but the Chumbul, at the fort, is deep; and in order to ford it at Keytereec, near four miles higher up, the road makes a circuit, among hills and broken ground, so as to measure 12 1/2 miles.

The Chumbul is one of the most considerable rivers of Hindustan. Taking its rise near the ancient city of Mundu, in the heart of the province of Malwa.

* Such was the information received from the people on the spot; but the account given by ERADUT KHAN, who was present in the midst of these battles, proves it to have been fought nearer to Agra.

On the day before the action, AZIM SHAH was encamped "between Jubjow and Agra, on a barren plain, void of water, so that the army was much distressed." (Memoirs, p. 30.) This must have been between the Ban-Gunga, which runs past Jubjow, and the Utingen, which is distant from it eight miles and one half, on the road towards Agra.

On the morning of the battle (Sunday the 18th of Rubbee ul Awwul A. H. 1119, or June 19, 1707 N. S.) the Prince Bedar Bucht, who commanded the advanced guard of AZIM SHAH's army having reached a village, near which was a stream of clear water, was advised by ERADUT KHAN to halt. This could be no other than the Utingen, which is the only stream of water between Jubjow and Agra. The Prince consented to follow his advice, but afterwards, in the absence of ERADUT KHAN, advanced; giving up the advantage of the water; and as he appears to have marched at least an hour after this, before he met with the enemy, (Memoirs, p. 33.) we may suppose the engagement to have commenced, at the distance of three miles from the Utingen, on the side of Agra. within
from Agra to Oujein.

Within fifteen miles of the Nerudda, it pursues a north-easterly direction, and after washing the city of Kotah, and receiving the tribute of many subordinate streams, at length empties it itself into the Jumna, twenty miles below Etawa. The whole length of its course is about 440 miles. The breadth of its channel, at the ford of Keyteree, is three quarters of a mile. That village stands on the southern bank, which is bold and lofty. In the rainy season, when the channel is full, the prospect of such a body of running water, bounded by hills, which rise in a variety of fantastic shapes, forms a landscape peculiarly interesting to a traveller, whose eye has been fatigued with contemplating the uniformity of that vast plain, which is embraced between the Ganges and the Jumna.

Chooola-Seray is a small village, with a mud fort, in which resides a collector on the part of the Mahrattas.

Feb. 28.—Marched S 29 E 17, 2 miles, to Noor-abud, a large village, on the south bank of Sank river, over which is a bridge of seven arches, very well built of stone. Adjoining to the village is a pretty large garden, enclosed by a stone wall; the work of Aurungzebe, as appears by the following inscription, over the gate:

كرد باغ بناء به مير
بهري تاريز اد لجمور سنر
فيض بخش جهان جومه متنير
کفت ائتف ك اد بدى باغ جهال
1877 هجري

TRANSLATION.

"This garden was planted by the king Aalum-Geeer,

"Whose universal bounty rivals that of the Sun, in all his splendor:

"When he demanded a sentence to denote its date

"An invisible voice replied thou hast seen the garden of beauty."

A. Hej. 1077.

The
The last words 

باج جبال

contain the date, agreeably to the Persian notation, thus

\[
\begin{array}{c}
\text{ب} & 2. \\
\text{ا} & 1. \\
\text{غ} & 1000. \\
\text{j} & 3. \\
\text{م} & 40. \\
\text{ا} & 1. \\
\text{ن} & 30. \\
\end{array}
\]

1077.

answering to the year of our æra 1666.

Within the garden is a monument, to the memory of Goónna Begum, a princess celebrated for her personal accomplishments, as well as for the vivacity of her wit, and the fire of her poetical genius. Several of her lyric compositions, in the Hinduflamy language, are still sung and admired*. She was the daughter of the Nawab Alla Kooli Khan, sur-
named Chinga, or Shesh Angooshtee, from having six fingers on each hand; a Munsubdar of 5000 horse. His daughter after being betrothed to Shujah-ud Dowlah, was married to Ghazee-ud-deen Khan and this rivalship is said to have in part laid the foundation of the mortal enmity which afterwards subsi-
dided between that Vizier and the Nawab Supder Jung, the father of Shujah-ud Dowlah. The

shrine bears this inscription 1189

آمغمکنا بیکم

"Alas! Goónna Begum!" the letters in the original, taken as numerical characters, give the date 1189 of the Hejiree, or of our æra 1775.

* One of them is inferred by Sir William Jones in the Asiatic Researches, vol. I. p. 55.
From this garden, the hill and fort of Gualior are seen, bearing $S \ 32^\circ \ E$.

On this march, besides the Sank, we crossed two other rivers, the Cohury or Quaree and Ahjin; both fordable. The face of the country is bare, being destitute of trees, and almost without cultivation. Near the road are several small forts, some of mud, and others of stone, possessed by petty chiefs, who derive a precarious revenue from predatory attacks on the unwary and defenceless traveller.

Feb. 29.—Marched $S \ 27^\frac{1}{2} \ E$, 13.2 miles, to Gualior, and encamped to the north-west of the fort. The hill on which stands this celebrated fortress, runs from $N \ 13^\circ \ E$ to $S \ 13^\circ \ W$. It is in length one mile and six tenths. Its greatest breadth does not exceed 300 yards. The height at the north end, where it is greatest, is 342 feet. At this end is a palace, and about the middle of the fort are two remarkable pyramidal buildings of red stone. They are in the most ancient style of Hindu architecture, and are said to have been built for the residence of the mother-in-law and sister-in-law of a Rajah, who reigned in a very remote period, when this fortress was the capital of an extensive empire. A stone parapet runs all round, close to the brow of the hill, which is so steep, that it was judged perfectly secure from assault, till Major Popham took it by escalade, on the 3d August 1780: The only gate is towards the northern extremity of the east side, from which

* The particulars of this brilliant achievement, which reflects equal honour on that officer, who commanded in chief, and on Captain Bruce, who proposed the measure, and led on the party which first gained a footing on the rock, are too well known, to stand in need of recapitulation in this place. The fort was, soon after delivered, agreeably to the terms of alliance, to the Rana of Gohud. But that prince having failed in the performance of his engagements to the English government, during the war, and afterwards deviated from the conditions of the treaty with the Marattas, wherein he had been included, was justly abandoned to their resentment. Sindiah invested the fort, and, after a fruitless siege of many months, prevailed by corrupting a part of the garrison.
which, by several flights of steps, you ascend to the
top of the rock. Within are several large natural ca-
vities in the rock, which contain a perpetual supply of
excellent water. On the outside, about half way up,
are many cells, which contain the figures of men and
animals, carved in the same manner as those excava-
tions themselves, out of the solid rock. Along the
east side, near the summit, runs a line of blue ena-
mel, very fresh, and brilliant: a proof that this ma-
ufacture attained considerable perfection in Hindu-
stan, at an early period.

The town, which runs along the east side of the
hill, is large, well inhabited, and contains many good
houses of stone, which is furnished in abundance by
the neighbouring hills. These form a kind of ampli-
theatre, furrounding the fort and town, at the distance
of from one to four miles. They are principally com-
pofed of a reddish schistus, which seem to contain a
large proportion of iron. Their surface is rugged, and
they are defitute of vegetable productions. To the
eastward of the town, runs the small river Soonrica,
which, at this season, is nearly dry. At the distance of
700 yards from the northern extremity of the fort, is a
conical hill, having on the top a remarkable stome build-
ing. It consists of two high pillars, joined by an arch.
It seems to be of ancient workmanship, but I could not
learn for what purpofe it had been erected. Beyond
the river Soonrica is a handsome stone building, with
a cupola covered with blue enamel, the tomb of Ma-
hammed Ghaus, a man celebrated for learning and
sanctity, in the time of the Emperor Akber. Within
the enclosure which surrounds this monument, is a
small tomb, to the memory of Tan-Sein, a musician
son, who admitted his troops. The Rana was soon after com-
pelled to deliver himself into the hands of Sindiah, who shut
him up in this fortress for the remainder of his life. That was
not of long continuance, and his death has been usually ascribeful
to violent means. The prevailing report in the adjacent country, is
that poison was administered, which not proving effectual, he was
strangled.
of incomparable skill, who flourished at the court of the same monarch. The tomb is overshadowed by a tree concerning which a superstitious notion prevails, that the chewing of its leaves will give an extraordinary melody to the voice.

The district depending on this town, which includes the country of Ghod, yields twenty-two lacs of rupees, fifteen of which are paid into the treasury, the remaining seven going to the expenses of collection. The administration of the province was at this time entrusted by Sindiah to Ambajee Inglia, one of his principal generals; in whose absence, his brother Khundojee was collector of the revenue, and governor of the fort.

A considerable trade is here carried on, in cloth from Chandéri, and in indigo. About seven cols from hence, on the road to Nirwir, at the village of Beereih is a mine of iron, which is worked to considerable advantage. The fort itself, from its great security, is made use of by Sindiah as the place of confinement for his state prisoners; and the grand repository of his artillery, ammunition, and military stores.

From Gualior, the straight road to Oujein passes by Nirwir and Seronge. But as the Rajah who then possessed Nirwir was a man of treacherous character, stained with barbarous massacres, and maintained a troop of banditti, to plunder every traveller that came within their power, it was recommended to us to go by the route of Jhanfi.

The progress of the Mahrattas in Hindustan, being marked, like that of a pestilential blast, with destruction, is an object of no pleasing contemplation. Yet, it may not be ungrateful to the benevolent reader to hear,
hear, that the cruel Rajah of Nirwir, expelled from his fort, and reduced to depend for a scanty pittance on the bounty of the invaders, has no longer the power of doing mischief.

On the 6th of March we proceeded to Antery, S 16 E 12.9 miles. The road lies between ranges of hills. It is sufficiently wide; but in many parts so encumbered with large roundstones, as to be with difficulty passable by wheel carriages. The first hills, towards Gualior, are of the same texture with those which environ the fort; but those towards Antery are of a quartzzcolstone. Antery is a pretty large walled town, with a fort adjoining; situated at the foot of the hills on the banks of the small river Deuloo.

March 7.—Marched to Dibborah, S 28 E, 15 miles. The road is good, over a champaign country, pretty well cultivated. The crop of barley at this time was ripe. Dibborah is a small village, belonging to a Rajah Pirtiput of Pachour. That is a fort situated on an oblong hill, which, as well as two other forts belonging to the same Rajah, was in fight, on this day's march. The Rajah is by extraction a Jat. He is said to have made an obstinate resistance against the Mahrattas, on their entrance into this country; but he has been compelled to pay them a tribute.

March 8.—Marched S 20½ E, 13.8 miles, to a spot, about three miles to the north-west of Ditteah. The tents had been sent on, to be pitched beyond the town. But the Rajah, who is tributary to the Mahrattas, having fallen greatly in arrears, the approach of our people raised an apprehension, that a detachment of troops was coming from Gualior, to exact payment by force. Under this misconception, the Rajah's people refused to permit our tents to approach nearer the town. But, no sooner were they better informed, than the uncle of the Rajah came with a numerous retinue, to pay his respects to
to the resident; and with great eagerness of hospitality, invited us to pitch, the next day, on a spot close to the palace.

Close to the encampment of this day, is a pretty high and rugged hill of quartz, some pieces of which are beautifully chrysalized. On its side grows the *Trophis Aspera* of König, called Sahoora. On this poor rocky soil, it is low and bushy; but in the plain it is a tree of considerable magnitude. From an idea of its astringent, or antiseptic virtue, the natives use little pieces of the wood, split at one end into a kind of brush, for cleaning their *ee h*: the use of these they recommend as a preservative against tooth-ache; or a remedy for that disease.

On the same rocky hill grows a beautiful species of *Evolvulus*, of a blue colour, called by the natives Schewa. It is the *E. alpinoides* of Linnaeus. It was also found in plenty, on the argillaceous hills of Dholpoor and Gualior. Within the fort, at the latter place, it abounded so much, that in many spots, a carpet of the finest azure seemed to be spread on the ground.

March 9.—Marched through the town of Ditteah, which is in length above a mile and a half, and nearly as much in breadth; populous and well built; the houses being of stone, and covered with tiles. It is surrounded by a stone wall, and furnished with gates. At the north-west extremity is a large building, with one large and six smaller cupolas: which was the ancient habitation of the Rajahs, and is now inhabited by some relations of the family: but the present Rajah has built a palace for himself, without the town, on the south-east side. It stands on an eminence, and commands a view of the country, as far as Pachour on one side, Nirweir on another, and Jumfi on a third. Close to this hill, is a pretty extensive lake, on the bank of which we encamped. Bearing and distance from the last encampment S 43° 1/2 E., five miles two furlongs.
This town is in the province of Bundelcund: the inhabitants are a robust and handsome race of men, and wear the appearance of opulence and content. Like the other Bundelahs, they have the reputation of a warlike people; and about two years after our visit, they gave a signal proof, how well they merit that character. Gopal Row Bhow, Scindiah's commander in chief in Hindustan, having marched with all his army against Ditteah, to compel payment of the tribute, and exact a fine, was opposed by the Rajah's forces. An engagement ensued, in which the troops of Ditteah charged, sword in hand, the veteran battalions of De Boigne, which were commanded by Major Frimont, an officer of ability and experience. The Bundelahs shewed no fear of the musket and bayonet, and there were several instances of grenadiers cut down while their bayonets were buried in the breast of the assailant's horse. The brigade lost 300 men, in this attack, and Major Frimont himself assured me, that nothing but a continual discharge of grape-shot, from the guns, preserved it from utter destruction.

The district yields a revenue of nine or ten lacks of rupees annually, subject to the payment of a tribute to the Mahrattas; the amount of which varies with their power to exact it.

This evening, the resident received a visit from the Rajah, whose name is Sutterjet, a man about forty years of age, above six feet high, of an athletic form, and graceful deportment; with a countenance not unpleasing, except that the extensive use of opium has given him an air of stupidity. Notwithstanding his habits of intoxication, and inordinate indulgence in sensual pleasures, he is fond of athletic amusements, particularly the chase. His activity and courage, in the attack of the boar, the neel-gaw (antelope pecta of Pallas, or white footed antelope of Pennant) here called roz, and of the tyger, with all of which the neighbouring forest abound, are greatly extolled.
The following day we halted to return the Rajah's visit, and on the 11th March, marched to Jhanji, and encamped to the S W of the fort. Course $36\frac{1}{2}$ E, distance $15\frac{1}{2}$ miles. This is a considerable town, though smaller than Ditteah. It is commanded by a stone fort on a high hill; to the south-east of which, at the distance of five or six hundred yards, is another hill, nearly on a level with the fort. The district dependent on this town, which yields about four lacs of rupees per annum, belongs to the Peshwa, and having been, for fifty years, uninterruptedly in his possession, it is quieter and better cultivated than most of the neighbouring territories, which have undergone frequent changes. On this account, it is frequented by the caravans from the Deccan, which go to Furrukhabad, and the other cities of the Doohb. Hence an afflux of wealth, which is augmented by a considerable trade in the cloths of Chunderiri, and by the manufactures of carpets, and of bows, arrows, and spears, the principal weapons of the Bundelkund tribes.

The Soubahdar of Jhanji, Rogonat'h Harry, commonly resided at Burwa-Sagur, and left the care of Jhanji to his younger brother Sheuram Bhow. This gentleman paid the resident a visit, on the evening of his arrival. He is a tall, handsome man, and of genteel demeanour. At his request we halted next day, and returned his visit in the evening. He received us at his house in town, where we saw his brother Litch Mun Row, elder than Sheuram Bhow, but younger than the Soubahdar. He was merely in a private capacity. Formerly he was in Sindiah's service, and about two years before this period, was sent into Bundelkund, with a considerable force and twenty-two guns. But he was defeated by Nooni Erjun Sing, a Bundelkund chief, with the loss of all his guns and baggage.

March'13.—Marched S 56\frac{1}{2} E, twelve miles five furlongs, to Burwa Sagur, so called from a rivulet, named the Berwa, which runs past it and by embankment, is made
made to form a very large pond (in Hindui, Sagur) at the back of the fort or castle. The village is small, but contains several good houses, and the fields about it are very well cultivated. The castle, in which the Soubahdar resided, resembles an old Gothic building. It was built by an ancient Rajah of Ouncha, and is laid to be one of fifty-two forts, for the building of which he gave orders on one day. This ancient city of Ouncha, lay on our right, on this day's march; it is situated on the banks of the Betwa, about nine miles S E by S from Jhansi. The Rajah of Ouncha was formerly the head of the Bundelah tribes, from whom the other Rajahs received the teeka, or token of investiture. But his revenue has, by various defalcations, been reduced to one lac of rupees, and his consequence has proportionably declined. The name of the present Rajah is Bickermajeet.

On this day's march, we passed the Betwa, for the first time. This river, from its force, south of Bopal, to its confluence with the Jumna, below Calpee, describes a course of 340 miles, in a north-easterly direction. Its bed, where we crossed, was three furlongs in breadth; sandy, and full of round stones. The water, at this season, is only knee-deep; but in the rains, it swells to such a height as to be impassable. Two miles from Burwa-Sagur, we passed the Bhood Nullah, on a bridge of eight arches, built by the present Soubahdar.

On our arrival, we were agreeably surprized to receive from the Soubahdar, a present of cabbages, lettuce, celery, and other productions of an European garden. In the evening, the Soubahdar paid us a visit; he appeared to be about sixty years of age, rather below the middle stature; his countenance bespoke intelligence, and his manners were pleasing. Having had occasion, on account of some bodily infirmity, to repair to the English station of Kanhpoor, for medical assistance, he had contracted a relish for European manners.
manner and customs. He had discernment enough to perceive our superiority in arts and science over his countrymen; and possessing a spirit of liberal enquiry, and an exemption from national prejudices, which is very uncommon among the natives of Hindustan, he was very desirous of gaining a knowledge of our improvements. Next morning, when we returned his visit, he received us in an upper room of the castle, which, instead of the Hindu-fany musium, was furnished with chairs and tables, in the European manner. He showed us several English books, among which was the second edition of the Encyclopædia Brittanica. Of this he had got all the plates neatly copied by artists of his own. To get at the stores of science which these volumes contain, he had, even at that advanced period of life, formed the project of studying the English language. He expressed great anxiety to procure a teacher, or any book that could facilitate his pursuit; and was highly gratified by Lieutenant M'Pherson's presenting him a copy of Gilchrist's, Dictionary. He entertained us with several tunes on a hand-organ, which he had got at Kanhpoo; and exhibited an electrical machine, constructed by a man in his own service. The cylinder was a common table shade; with this he charged a vial, and gave pretty smart shocks, to the no small astonishment of those who were the subjects of his experiments, and of the spectators. As the weather was very dry, the operation succeeded remarkably well. He even proposed sensible queries, on the nature of the electric fluid, and the parts of the phial in which the accumulation took place; as, whether in the glass, or the coating, &c. which showed that he did not look on the experiments with an eye of mere childish curiosity, which is amused with novelty; but had a desire to investigate the cause of the phænomena. I am sorry to add, that this man, being, about two years ago, seized with some complaint, which he considered as incurable, repaired to Benares, and there drowned himself in the Ganges.

March
March 15.—Marched S 0 E, 11,3 miles, to Pirtipoor, a small village, belonging to the Rajah of Ouncha. The road is stony, and much encumbered with thorns.

March 16.—Marched S 17 E, 13 miles, to Bumourree. The road more open, especially towards the end. We encamped on a plain, very prettily shaded with clumps of trees. The village stands upon a rising ground, the houses are of stone, covered with tiles; the streets wide and clean.

March 17.—Marched S 25 E, 11,3 miles, to Belgaung. The road lies through a wood, in the beginning much encumbered, afterwards more open. In the woods, we met with the Bombax Gossypium of Linnæus, a beautiful tree, of middling size, which grows straight, and has but few branches, all at the top. It bears large yellow flowers, in clusters, at the ends of the branches. At the time when I saw it, it had no leaves.

March 18.—Marched S 2 W, 10,05 miles, to Tearree. The road, in the beginning, encumbered with brush-wood, but afterwards clear, and the country cultivated. The crop of wheat and barley was nearly ripe. This is a large village, with a fort, on an adjoining height. It is in the district of the Ouncha Rajah. Chandéri is reckoned sixteen cosfs from hence, and Chatterpoor twenty-five.

March 19.—Marched S 23½ W, 11,97 miles, to Marouree, a pretty large village, with a fort, belonging to Ram-Chund, the Rajah of Chandéri, which is distant fourteen cosfs, towards the N. W. The Rajah lives in a kind of retirement at Oudh, and has left the administration in the hands of his son, who pays a tribute to the Mahrattas. The road was good, except at passing the small river Jumnur, the banks of which are steep, and its bed full of large round stones. Also,
Also, towards the end of the march, the ground is broken into holes. The country open, and pretty well cultivated.

March 20.—Marched S 56 W, 8,07 miles to Sindwáha, through a country the most completely cultivated that I have ever beheld in Hindustan. The plain, as far as the eye can reach, was covered with a luxuriant crop of wheat and barley. It is in the district of Chandéri, but belongs to a Rajpoot chief, who is in some measure independent of the Rajah, only paying chout to the Mahrattas. Near the village is a pretty large tank, banked in with stone. To-day we crossed the small river Jónny, and a nullah. On the banks of this nullah, I found the D.hawry (Asi. Res. IV. 42.) which I learn from Doctor Roxburgh is the Lythrum fruticosum of Linnaeus *.

March 21.—Marched S 21½ W, 9,32 miles to Nárat. Road intersected with several nullahs, and broken ground: the country cultivated, but not so well as yesterday. This village is situated at the foot of the hills which separate Bundelcund from Málawa. It belongs to the Bundéla Rajah of Gur-cootah, but pays one-fourth of the revenue to the Mahrattas, who have a Pandit here, on the part of the Soubahdar of Great Sagur, for the collection of it.

March 22.—Marched S 23½ W, 8,35 miles, to Maltown. The road lies through a pass in the hills, the first part narrow, steep, much encumbered with stones and thick jungle. Above the ghaut there is a good road, with a gentle declivity all the way to Mal-town, and a mile beyond it, where we encamped.

* The Editors of Dr. Roxburgh’s work refer it to the genus Griglea, with the trivial name of tomentosa, which seems to have been applied from some misconception, as the leaves, though whitish beneath, are smooth.
This is a large village, with a stone fort. It belongs to the same Rajah as Narát, and pays chout in a similar manner.

March 23.—Marched S 64 W, 11,92 miles, to Kémulaja, a large walled town, and adjoining to it a fort, built on a hill. It belongs to the district of Sagur, which is distant about seventeen cols to the south-eastward. The Subahdar of Sagur is son to Balajee of Calpee. The districts under Balajee, his brother Gundaher, and his son, yield a revenue of about thirty lacks of rupees, of which nine are remitted to Poona.

March 24.—Marched S 63½ W, 10,25 miles, to Rampoer, through a country level and well cultivated. The soil is a black vegetable mould, and by the road side, is cracked, forming holes. Many villages are seen at a distance, on both sides of the road. The grain was in great part got in.

March 25.—Marched N 85 W, 10,62, miles, to Koorwey and Borâso, two towns, almost united, on the banks of the Betwa. They are of considerable size, and at the former is a large stone fort. They are inhabited by Patans, who settled here about a hundred years ago, in the time of Aurungzebe. Their chief and the head of the present Bopâl family, were brothers, and obtained their respective establishments at the same time. The present Nawâb is Hoormut Khan. His revenue is said to be between one and two lacks of rupees, but it is sequestrered, for the payment of a debt to the Mahrattas; so that he has nothing more, for his expenses, than they choose to allow him. The road was good, the country well cultivated.

March 26.—Marched S 23½ W, 11,3 miles, to Kirvah. Crossed the Betwa close to yesterday’s encampment. The banks are steep, and the bed stony. The soil adjoining is a black mould; but, two miles and
and a half farther on we entered on a clay, the surface of which was covered with reddish stones, that seemed to contain iron. This extended for a little way on each side of the road, where the ground was high, and appeared to be little capable of cultivation; but, at some distance, the fields which lay lower were covered with grain. This kind of soil continued for two miles, and terminated at a small nullah, near the banks of which is a plantation of date trees (Elate Syro-vexfis). For the remaining part of the way, the soil is the same black mould that we had seen in the last marches. The grain was in great part cut down, and carrying into the villages. The road good, country well cultivated. Kirwah is a middle-sized village, in the district of Koortwey. At the distance of three cols to the south-eastward is seen a remarkable conical hill, at the foot of which is a large town, named Odipoor, which belongs to Sindiah. There was formerly a fort on the hill, but that has fallen to ruin, or been destroyed.

March 27.—Marched S 5½ W, 8,12 miles, to Basouda, a large town, belonging to the district of Bhilsah. The road was, in general, good. The soil alternately black mould, and a reddish clay, with stones of a ferruginous appearance. Where the black mould is, the country is well cultivated: the other seems unfuitable to vegetation, and consequently remains waste.

March 28.—Marched S 13½ W, 14,3 miles, to the small river Gulcutta, or cut-throat, so named from murders committed on its banks: the road good; soil, a black mould: country well cultivated; grain almost all cut down.

March 29.—Marched S 28 W, 10,53 miles, to Bhilsah. Road good, soil as before. The wheat harvest, which is the principal grain of the Rubbe, was got in. They cultivate very little barley. In the Khereef they
they have a good deal of rice, also Joow (Holcus Sorghum Linn.) and Moong (Phaseolus Mungo) but no Bajerah (Holcus spicatus). Celebrated as this place is for tobacco, we could get none of a good quality. The crop of the former year had been all exported, and the new one was too fresh to be fit for use. The town, or as it is called, fort of Bhiljah, is enclosed with a stone wall, furnished with square towers, and a ditch. The suburbs without the wall are not very extensive, but the streets are spacious, and they contain some good houses. The town is situated nearly on the south-west extremity of the district, where it is contiguous to that of Bopal. To the eastward of the town, at the distance of six furlongs from the wall, is a high rock, very steep, on the top of which is a Durgah, consecrated to the memory of a saint, named Seid-Jelal-ud-deen Bokhari. On the top of this rock I found a pretty large tree of the Sterculia Urens (Roxburgh's Indian Plants, Vol. I. No. 24.) here called Curhhee.

April 1.—Marched S 64 W, 7.82 miles, to Goolgaung, a small village, in the territory of Bopal. The road lies across the Bétwah, the bed of which is rocky, very uneven and slippery. The remainder was a good carriage road. The last part lies between hills, which abound with a great variety of vegetable productions. Among these, we found Tendu ( Diospyros Ebenum) Acór (Alangium. Hort. mal. iv. 17,26.) and a shrub for which I could get no name at this place. In the Dooab it is called Binna or Ponga. It is the Ulmus integrifolia Roxburgh's Indian Plants, Vol. I. No. 78.

April 2.—Marched S 64 W, 7.82 miles, to Amáry, a village in the Bopal district, situated between two pretty high hills, and partly built on the face of the most southerly of the two. In the way lies the small river Ghorá-Puchar, so named from the great number of large, round, slippery stones, with which its bed is filled,
filled, rendering the passageway dangerous for horses. The road to that river is through a jungle, and in several parts uneven; the remainder good, though a cultivated country.

April 3.—Marched S 51° W, 16,11 miles to Bopal. About four miles from Amáry is a steep pass, uphill, for the space of about twenty paces. The remainder of the road is good. The first part of it is through a thick jungle, the last through a cultivated country. The town of Bopal is extensive, and surrounded with a stone wall. On the outside is a large gunge, with streets wide and straight. On a rising ground, to the south-west of the town, is a fort, called Putteh gurh, newly erected, and not yet quite finished. It has a stone wall, with square towers, but no ditch. The spot on which it is built is one solid rock. To the south-west, under the walls of this fort, is a very extensive tank or pond, formed by an embankment, at the confluence of five streams, issuing from the neighbouring hills; which form a kind of amphitheatre round the lake. Its length is about six miles, and from it the town has the addition of Tal to its name. These hills, and others in the neighbourhood, contain a soft free stone, and a reddish granite, the latter of which seems well calculated for buildings that will resist water, and the injuries of the weather; it is accordingly used in the new embankment which is now building at the east end of the lake. From this part issues the small river Patara, and it is said that the Betwah takes its rise from another part of the same.

The town and territory of Bopal are occupied by a colony of Patans, to whom they were assigned by Aurungzere. The present Nawab Mohammed Hyat, a man about sixty years of age, had from indolence, love of pleasure, want of capacity or devotion (for I have heard each of these reasons assigned) resigned the whole administration into the hands of his Dewan (since
(since dead), who was born a Brahmen, but purchased, when a child, by the Nawab, and educated in the Mussulman faith.

The revenue of Bopāl is estimated at ten or twelve lacs of rupees. It does not pay any regular tribute to the Mahrattas, but from time to time a handsome present is given, to conciliate their friendship. The people seem to be happy under the present government, and the Dewan, by his hospitality, and the protection afforded to strangers, had induced the caravans, and travellers in general, to take this road between the Deccan and Hindustan.

April 7.—Marched S 71 W, 14 miles, to Pundah, a pretty large village, in the Bopāl territory, and situated on the frontier. The first two miles past the town, to the edge of the great lake, were very stony; afterwards the road was good, the soil rich, and the country well cultivated. The crop now entirely got in.

April 8.—Marched S 78 W, 9,47 miles, to Schore, a considerable town, belonging to the Mahratta chief Eetul-Row. His deputy, Gopal Row, who resided here, had the collection of four pergunnals, Schore, Ashtah, and two others, amounting, in all, to about three lacs of rupees.

Schore is situated on the banks of the little river Rootah-Seein, and is surrounded with a large grove of mango and other trees. Here is a considerable manufacture of striped and chequered muslins. The road was good, soil a black mould, but the cultivation partial.

April 9.—Marched N 77 W, 11,19 miles, to Farker, a town belonging to the heirs of the Mahratta chief Naroo-Shunker. It is in the pergunnah of Shujaukulpoor, which is divided from that of Schore by the river
river Párbutty. The road good, and soil a fine black mould; but there is a good deal of waste land near the road side.

April 10—Marched N 50 W, 16,55 miles, to Shujáwulpoor. Road good; soil the same black mould as before. For the first ten miles, very little cultivation, afterwards a good deal.

Shujáwulpoor is a large town, situated on the north-east bank of the river Jammeary. It contains a fort, or walled town, and without the wall, a good bazar, in which are many large, well-built houses. The country is liable to the depredations of a set of robbers, called Grajiah, which in some measure accounts for the inferior state of cultivation. This is the head town of a pargannah of eight lacs of rupees, held in jageer, from the Peshwa, by the heirs of Ná'roo-Shunker. They were in camp with Síndiah, and rented the district to aumils, who were changed every two or three years. Those men collected what they could, oppressed the ryots and brought depopulation on the country. About twelve years ago this district was under the management of Appah-K'handey Raw, and then it was well peopled and cultivated.

This is a considerable market for striped muslins, doputtahs, &c. Opium is cultivated to some extent, and is said to be of a good quality.

April 11—Marched N 75½ W, 11,87 miles, to Beinfround, a small village in the district of Shujáwulpoor. Road good; soil as before, country more cultivated than yesterday.

In this country are many Muwah trees (Bassia latifolia Roxb. Ind. plants Vol. I. No. 19, Madhuca, Asiát. Vol. VI.)
Ref. vol. I.) They were now in flower, and as the number of seeds in the ripe fruit is very uncertain, which has caused some confusion, I this day examined the germina of twenty-one flowers. Thirteen had the rudiments of eight seeds, six of nine, and two of seven. The stamens were 24, 25, and 26, but I have formerly seen flowers with only 16.

April 12.—Marched west 17,89 miles, to Shahjehanpoor. The road was good, the soil as before, but the country appeared to have remained long uncultivated. It is all overgrown with brushwood, among which the Plafs (Butea frondosa) and wild date (Elate fikveteris) hold the principal place.

Shahjehanpoor is a considerable town, and head of a pergunnah, belonging to Sindiah. It lies on the banks of the river Sagurmuttere. About half a mile to the westward of the town is a conical hill, which is conspicuous at a great distance.

April 13.—Marched S 59 1/2 W, 16,66 miles, to Turana, a town and head of a pergunnah, belonging to AHELIAH BAI. The first thirteen miles we met with very bad road, among rocks and broken ground, incapable of cultivation. The remainder of the road was good, through a cultivated country. In the neighbourhood of Turana, we found an avenue of young trees of considerable extent, which we were informed was planted by AHELIAH BAI. A taste for improvements of this nature is uncommon among Mahrattas; and this gave me a favourable impression of that prince's government, which was confirmed by farther enquiry.

April 14.—Marched S 48 1/2 W, 12 miles, to Tajpoor, a village belonging to Sindiah. The road stoney, and the ground full of holes. Little cultivation.
April 15.—Marched S 75½ W, 10,37 miles, to Oujein. The road good. This city called in Sanscrit, Ujjaini, and Awinti, or Avanti, boasts a high antiquity. A chapter in the Poorans is employed on the description of it. It is considered as the first meridian by the Hindu geographers and astronomers, so that its longitude from our European observatories is an object of some curiosity. By a medium of eleven observations of Jupiter's first and second satellettes (taking the times in the ephemeris as accurate) I make its longitude from Greenwich 75° 51' E. Its latitude, by a medium of eight observations 23° 11' 13" N.

But the city which now bears the name is situated a mile to the southward of the ancient town, which, about the time of the celebrated Vicramadittyia was overwhelmed, by one of those violent convulsions of nature which, from time to time, alter the surface of our globe. The following narrative of this event, involved in a cloud of fable, is handed down by the Brahmens. A certain deity, named Gundrupsein, was condemned, for an offence committed against the god Inder, to appear on earth, in the form of an afs, but on his entreaty, he was allowed, as a mitigation of the punishment, to lay aside that body in the night, and take that of a man. His incarnation took place at Oujein, during the reign of a Rajah, named Sundersein, and the afs, when arrived at maturity, accosting the Rajah in a human voice, proclaimed his own divine origin, and demanded his daughter in marriage. Having, by certain prodigies, overcome the scruples of the Rajah, he obtained the object of his wishes. All day, in the form of an afs, he lived in the stable, on corn and hay; but when night came on; laying aside the afs's skin, and assuming the form of a handsome and accomplished young prince, he went into the palace, and enjoyed, till morning, the conversation of his beauteous bride. In progress of time, the daughter of the Rajah appeared to be pregnant, and as her husband, the afs, was deemed incapable of producing such
such a state in one of the human species, her chastity became suspected. Her father questioned her upon the subject, and to him she explained the mystery. At night the Rajah, by her directions, hid himself in a convenient situation, and beheld the wonderful metamorphosis. He lamented that his son-in-law should ever resume the uncouth disguise, and to prevent it, set the as's skin on fire. Gundupshin perceived it, and though rejoiced at the termination of his exile, denounced the impending resentment of Inder, for his disappointed vengeance. He warned his wife to flee; for, said he, my earthly tenement is now consuming, I return to heaven, and this city will be overwhelmed with a shower of earth. The princess fled to a village at some distance, where she brought forth a son, named Vicramaditya, and a shower of earth falling from heaven, buried the city and its inhabitants. It is said to have been cold earth, and to have fallen in small quantity upon the fields all around, to the distance of several cofs, but to a great depth on the towns.

On the spot where the ancient city is said to have stood, by digging to the depth of from fifteen to eighteen feet, they find brick walls entire, pillars of stone, and pieces of wood, of an extraordinary hardness. The bricks, thus dug up, are used for building, and some of them are of a much larger size than any made in the present, or late ages. Utensils of various kinds are sometimes dug up in the same places, and ancient coins are found, either by digging, or in the channels cut by the periodical rains; having been washed away, or their earthly covering removed by the torrents. During our stay at Onjein, a large quantity of wheat was found by a man in digging for bricks. It was, as might have been expected, almost entirely consumed, and in a state resembling charcoal. The earth of which this mound is composed, being soft, is cut into ravines, by the rains; and in one of these, from which several stone pillars had been dug, I saw a space, from twelve to fifteen feet long, and seven or eight
eight high, composed of earthen vessels, broken, and closely compacted together. It was conjectured, with great appearance of probability, to be a porter's kiln. Between this place and the new town, is a hollow, in which tradition says, the river Sipparah formerly ran. It changed its course, at the time the city was buried, and now runs to the westward.

Adjoining to these subterraneous ruins, on the present bank of the Sipparah is the cave, or subterraneous abode of the Rajah Bhirtary. Before the gate of the court are two rows of stone pillars, one running from east to west, the other from south to north. You enter the court from the south-ward; within it are the entrances of two caves, or divisions of the palace. The outermost enters from the south; and is sunk about three feet under ground. From this entrance (which is on the side) it runs straight east, being a long gallery, supported on stone pillars, which are curiously carved, with figures of men in alto relievo. These figures, however, are now much effaced.

The inner apartment also enters from the south. This is a pretty wide chamber, nearly on the level of the ground, the roof supported on stone pillars, over which are laid long stones, in the manner of beams. On the north side, opposite to the entrance, is a small window, which throws a faint light into the apartment. It looks down upon the low ground, beneath the bank, on which the building is situated. On the left hand, or west side of the apartment, is a small triangular opening in the stone pavement. Through this you descend, about the height of a man, into an apartment truly subterraneous, and perfectly dark. This is also supported on stone pillars, in the same manner as the upper one. It first runs eastward, and then turns south. On the left hand side are two chambers, about seven feet
feet by eight. At the southern extremity is a door, which probably led into some farther apartment, but it is shut up with earth and rubbish. The fakeers who reside here say a tradition exists, that one subterraneous passagé went from hence to Benares, and to Hurdwar: and they tell us, that this door was shut up, about twelve or fourteen years ago, by the government, because people sometimes lost themselves in the labyrinth.

This is said to be the place in which the Rajah Bhirtóry, the brother of Vicramadittyā, shut himself up, after having relinquished the world. But there are various and discordant accounts of its construction and date. By some, it is said to have been constructed, in its present form by Bhirtóry himself. By others, these inner apartments are said to have been the mahl, or private chambers of Gundrufsein, and the colonnade before the gate to have been his public hall of audience, or Dewan-Aum. That this escaped the general wreck of old Oujein, and either was not affected, or sunk gently down, so as to retain its form, though thrown down under the level of the ground.

Such are the present appearances of this ancient city, which above 1800 years ago, was the seat of empire, of arts, and of learning; and it is a task worthy of the present lovers of science to discover the means by which this great revolution has been effected. There are not, as far as my inspection goes, any traces of volcanic scoriæ among the ruins, nor are there in the neighbourhood any of those conical hills, which we might suppose to have formerly discharged fire large enough to produce this effect. As tradition relates, that the river, on that occasion changed its course, an inundation from it might be considered as the cause. And in fact this river, while we were at Oujein, did swell to such a height, that great part of the present town, though situated on a high
bank, was overflowed, many houses within it, and whole villages in the neighbourhood, were swept away by the torrent. But yet the size of the stream, and the length of its course, the source being only at the distance of fourteen cols, seem unlike to furnish water enough to produce so complete a revolution. Therefore, we must consider the change of its course, in conformity to the tradition, rather as the effect than the cause of that event. An earthquake appears one of the most probable causes; and the only objection to it is the entire state in which the walls are found. They are said to be found entire, but I am not able from inspection to determine whether or not they are so entire as to render the supposition of an earthquake improbable. The only remaining cause which I can think of, is loose earth or sand blown up by a violent wind. We have instances in Europe of whole parishes being buried by such an accident. The soil of the province of Muliwa, being a black vegetable mould, is unfavourable to this supposition; but even this, when dry is very light, friable earth: and it may have been greatly meliorated in so long a period of ages. If we might be allowed to call into our aid a tradition, which, though disguised in fable and absurdity, has probably a foundation in fact, it would be favourable to this hypothesis. For none of the other causes would so much resemble a shower of earth as this; and sand driven by the wind would naturally be accumulated to the greatest height, on the towns, where the buildings would resist its farther progress in the horizontal direction.

The present city of Oujein is of an oblong form, and about six miles in circumference, surrounded by a stone wall, with round towers. Within this space, there is some waste ground, but the inhabited part occupies by far the greatest portion; it is much crowded with buildings, and very populous. The houses are built partly of brick, partly of wood. But even of the brick houses, the frame is first constructed of wood, and
and the interfaces filled up with brick. They are covered, either with lime terrace, or with tiles. The principal bazar is a spacious and regular street paved with stone. The houses on each side are of two stories. The lower, to which you mount from the street by five or six steps of stone, are mostly built of stone, and are taken up with shops. The upper, of brick or wood, serve for the habitations of the owners.

The most remarkable buildings are four mosques, erected by private individuals, and a great number of Hindu temples. Of these the most considerable is a little way on the outside of the town, at Unk-pát, a place held in great veneration, as being that where Kreeshen and his brother Bulbudder, or Bildeo, received the rudiments of their education. Here is a stone tank, with steps leading down to the water's edge: and this is said to be of great antiquity. But it has been enclosed with a stone wall, and two temples erected within the enclosure about twenty-five years ago, by Rung Raw Appah, of the tribe Pawár. These temples are square, with pyramidal roofs. That on the right, as you enter the gate, contains the images of Ram, Litchmun, and Sita, in white marble; and that on the left, those of Kreeshen and Radha, the first in black, and the second in white marble. All these figures are well executed.

Sindiah's palace in the city, which is yet unfinished, is an extensive and sufficiently commodious house, but without any claim to magnificence. And it is so much surrounded with other buildings, as to make very little appearance on the outside. Near it is a gate, which being all that remains of a fort said to be built soon after the time of Vicramaditya, may be considered as a good specimen of the ancient Hindu architecture.
Within the city, and near the eastern wall, is a hill of a considerable height, on the top of which is a Hindu temple of Mahadeo, and adjoining to it the the tomb of a Musulman saint, named Goga Sheherd. This hill is conspicuous from a distance, and a spectator on the top of it commands an extensive prospect on every side. To the northward he sees, at the distance of four miles, the rude and massy structure of Calydeh, an ancient palace, built on an island in the Sipparah, by a king of the family of Gour *. There are two square buildings, each covered with a hemispherical cupola, and divided below into eight apartments, besides the space in the centre. The communication with the land is made by a stone bridge over one of the branches into which the Sipparah is here divided. Below the bridge are several apartments constructed on a level with the water; and the rocky bed of the river is cut into channels of various regular forms, such as spirals, squares, circles, &c. to which, in the dry season the current is confined. Turning to the westward, he traces the winding course of the Sipparah, through a fertile valley, where fields of corn and clumps of fruit trees intersecting, diversify the prospect, till his attention is arrested by the fort of Beirawn-gurh, situated close on the top of the opposite bank. It is about a quarter of a mile in length, surrounded by a rampart of earth, and contains an ancient temple dedicated to the tutelary divinity of the place, whose name it bears. Still farther up the stream, and nearly opposite to the middle of the town, are the gardens of Abha-chitnavees and Rana Khan. On the latter no decoration of art has been spared; the former wantons in all the luxuriance of nature. Exactly over these, at the distance of half a mile from the

* A description of this extraordinary fabric is inserted in the Oriental Repertory, V. I. p. 266, from a letter of Sir W. Mallet, dated at Oujein, 13th April, 1785. The author gives an extract from a history of Malava, which proves the building to be the work of Sultanu Nasir-ud-deen-Gilgee, son of Ghias-ud-deen, who ascended the throne of Malava in the year of the Hijra 903, and reigned eleven years and four months.
river, is a grove of trees, on a rising ground. It con-
tains the tomb of another saint, named SHAH DA'WUL, 
but is more remarkable for having been the scene of 
a bloody action, about thirty years ago, between SIN-
DIAH and one of his Sirdars, named RAGOO, who, from 
having the command of certain troops of horse, was 
called PAGIH. This officer had been detached by 
SINDIAH, with a considerable force, to levy contri-
butions in Oudipore, and having received the money, 
refused to account for it. His master confined his fa-
mily, who had remained in Oujein, in consequence 
of which, RAGOO marched at the head of 30,000 men, to 
attack SINDIAH, who was in Oujein, with only five or 
fix thousand. With this inequality the fight began, 
on the plain adjacent to SHAH DAWUL's Durgah; but 
SINDIAH was joined by 6000 Goofsains; and a chance 
shot having killed RAGOO, his adherents were routed.

The prospect on this side is bounded by a ridge of 
hills, at the distance of about three miles. It runs from 
N N E, to S S W, and is seven miles in length; these 
hills are chiefly composed of granite, and from them 
the stone employed in building is supplied. But they 
are covered with vegetable mould to a sufficient depth 
to admit of cultivation.

To the south-west is a wide avenue of trees, which 
terminates a course of two miles, at a temple of GANESA, 
known as CHINTAMUN. It is visited by numerous 
processions at certain stated periods.

The south wall of the town is washed by the Sip-
porah, which makes a sudden turning at this place. 
This extremity of the city, called JEVINGPOORAH, con-
tains an observatory, built by the Rajah JEYSING of 
Ambheer, since named from him JEVAGUR. He built 
observatories at five principal cities, viz. Dehly, Ma-
tra, JEVAGUR, BENARES, and OUJEIN, as he informs us 
in the preface to the astronomical tables, published by 
him,
him, which, in compliment to the reigning Emperor, he entitled Zeej Mahommedshahy.

Turning to the east, we are presented with a different prospect. As far as the eye can reach is a level plain, which is only interrupted by a conical hillock at the distance of three miles, beyond which is an extensive lake, that lies close on the left of the road that leads to Bopaul. On the right of the road at the same place, is a Runnahl belonging to Sindiah, well stocked with deer.

The Rajah Jeysing held the city and territory of Oujein of the Emperor, in quality of Soubahdar; but it soon after fell into the hands of the Mahrattas, and has belonged to Sindiah's family for two generations. The district immediately dependent on the city, yields a revenue of five lacs per annum, and comprehends 175 villages. The ancient landholders, who were deprived of their possessions by the Mahrattas, still retain some forts, dispersed over the province; and partly by treaty with the conquerors, partly by force, receive a proportion of the rents from the adjacent villages. One of these people, who are called Graviah, is Hurry Sing, a Rajpoot; he possesses the mud fort of Doolétia about ten miles from Oujein. He commands a body of two hundred Graviah; and a neighbouring village, Khelana, the rent of which is 2000 rupees a year, pays him 150, or 7½ per cent. on the revenue. But these free-booters, not contented with the regular contribution, exercise the most lawless rape, so that travelling is unsafe; and they watch the occasion which any casual confusion or distress of the government, or the withdrawing of troops for foreign service, occasionally affords them, to extend their ravages to the gates of the city, or even within the walls.

The officers of government are almost the only Mahratta inhabitants of Oujein. The bulk of the people,
people, both Hindus and Musulmans, speak a dialect very little different from that of Agra and Delhi. The Musulmans form a very considerable portion of the inhabitants, and of their number a great part is composed of particular class, here known by the name of Bohrah. They distinguish their own sect by the title of Ismaeliah, deriving their origin from one of the followers of the prophet, named Ismaeel, who flourished in the age immediately succeeding that of Mahomed. This singular class of people forms a very large society, spread over all the countries of the Deccan, particularly the large towns. Swat contains 0000 families, and the number in Oujein amounts to 1500. But the head-quarters of the tribe is at Burhunpoor, where their moullah or high-priest resides. The society carries on a very extensive and multifarious commerce, in all those countries over which its members are dispersed, and a certain proportion of all their gains is appropriated to the maintenance of the moullah, whose revenue is consequently ample. He is paramount in all ecclesiastical matters, and holds the keys of paradise; it being an established article of faith that no man can enter the regions of bliss without a passport from the high priest, who receives a handsome gratuity for every one he signs. But he also exercises a temporal jurisdiction over his tribe, wherever dispersed, and this authority is admitted by the various governments under whose dominion they reside, as an encouragement to these people who form the most industrious and useful class of the inhabitants. A younger brother of the moullah resides at Oujein, and with that same title exercises over the Bohrahs resident there the authority, spiritual and temporal, annexed to the office. Five mouhillahs of the city are inhabited by them, and subject to his jurisdiction.

On our arrival at Oujein, we had plenty of excellent grapes from Burhunpoor. By the time this supply was exhausted, the grapes produced at Oujein came into season.
season. These are inferior in size and flavour to the former; but a singularity in this climate is that the vine produces a second crop in the rainy season. This however is acidulous, and much inferior to the first. The other fruits are the mango, guava, plantain, melon, and water melon, two species of *Annona, squamosa, and reticulata* (*Shereefah* and *Atah*), several varieties of the orange and lime trees; the *Falsah* (*Grewia asiatica*) from which the natives make a most refreshing, slightly acidulous sherbet; and as a rarity in a few gardens, the *Carica Papaya*.

The soil in the vicinity of Oujein, and indeed over the greatest part of the province of Malava, is a black vegetable mould; which, in the rainy season, becomes so soft, that travelling is hardly practicable; on drying, it cracks in all directions, and the fissures are so wide and deep in many parts, by the road side, that it is dangerous for a traveller to go off the beaten track, as a horse getting his foot into one of these fissures, endangers his own limbs and the life of his rider. The quantity of rain that falls in ordinary seasons is so considerable, and the ground so retentive of moisture, that wells are hardly used for watering the fields. Thus a great part of the labour, incident to cultivation in Hindustan, is saved. But this very circumstance makes the suffering more severe, upon a failure of the periodical rains; for the husbandman, accustomed to depend on the spontaneous bounty of heaven, and unprovided with wells in his fields, is with difficulty brought to undertake the unusual labour of watering, especially as it must be preceded by that of digging the source.

The harvest, as in Hindustan, is divided into two periods, the *Khareef* and *Rubbee*; the former being cut in *September* and *October*, and the latter in *March* and *April*. The kinds of grain cultivated here, taken in the order of their ripening, are as follow:

**Khereef.**
KHEREEF.

4. Mukka, in Hindustan Bhootah; Zea Mays. It was in flower the 20th of July, and is gathered in August or September.

2. Congnee Panicum Italicum was in flower July 28th.

3. Oord or Mashi; Phaseolus Max; flowers in July and August, ripe about the end of September.

4. Moong Phullee, Arachis Hypogaea; (ground-nut, or pig-nut of the West Indies) was in flower in September.

5. Mand or Mal, Cynorurus CoracanuS, Lin. Eleusine Coracana Gartner: in Hindustan the name is Murhua, in the Carnatic Natcheny, and in Mysore Râgy.

6. * Bajera, is a small round grain, esteemed very nutritious, but heating, and somewhat hard of digestion. Being very cheap, it is principally used by the poorer class of inhabitants, and by the Mahrattas, who make of it flat cakes, of which a horseman can carry under his saddle a sufficient provision for many days. It was in flower the 13th September, and is reaped in October.


The culm is very strong, and grows to the height of seven or eight feet. The spike egg-shaped, nodding.

* The Holcus Spicatus of Linnaeus. A description and figure of it are given in the 1st volume of the transactions of the Padoua (p. 124.) by Sign. P. Arduin. He obtained the seeds from Tunis, where it is called Drob. The internal structure of the fruitification, and the form of the spike, agree so well with the Bajera, that I have no hesititation in referring them to the same species. But the specimen represented by Sign. Arduin is much more ramified, with the culm and principal spike larger, than I have ever seen. This is probably a variety, produced by diversity of soil and cultivation.
or hanging (sometimes erect), six or seven inches in length, and about nine in circumference. Its times of flowering and reaping are the same with the last.

The Holcus cernius, which is the third species described by Sign. Arduin (Sagg. di Padou:) does not appear to differ from this, except as a variety: the erect or recurved position of the panicle, depending on its size and weight, compared with the strength of the stalk.

But it is subject to another variety, still more remarkable. The hermaphrodite calyx is sometimes biflorous, and ripens two seeds; sometimes uniflorous, producing only one. I have found, mixed in the same field, plants with erect, lax panicles, and others more compact and nodding. The former had, most frequently, one-flowered calyces, and the latter two-flowered. But, in some instances, the one-flowered and two-flowered were found on the same head, and even in the same branch of the panicle. The seeds in the first case are round, in the second hemispherical, one side of each being flattened by their mutual contact.

To ascertain the matter more accurately, I sent seeds of both kinds to Doctor Roxburgh, who sowed them in the botanical garden, at a distance from one another. The plants came up with one and two-flowered calyces indiscriminately, and flowers of both kinds were even mixed in the same panicle.

8. Moong; Phæolus Mungo. The specific difference between this and the Oord (P. Max) is very difficult to establish, yet its constancy forbids us to consider them as mere varieties.

1. The stalks of the Oord are hispid in a lesser degree than those of the Moong.

2. The
2. The stipules of the former are more acute than those of the latter.
3. The leaves are rather more acute.
4. The legumes shorter.
5. The seeds of the Oord larger, more compressed and black; those of the Moong smaller, rounder and green.

This was ripe about the end of October, being about a month later than the Oord.

9. Birtee; a species of Panicum, used in food, was in seed October the 6th.

R U B B E E.

1. Wheat; Triticum.
The species cultivated here has the following marks; Calyces four-flowered, ventricose, smooth, imbricated; the two outward florets with long beards, the third with hardly any; the fourth and innermost, neuter. From this character I am doubtful whether it should be referred to the species aestivum or spelta, or whether it may not be a new species. It was in the ear at Onjein, the 30th of January, and on the 19th of March, at the distance of six days journey, we found it ripe.

2. Channahl, Cicer arietinum.

3. Masoor a small legume, which I have not sufficiently examined. (*Ervum Lens?*)

4. Toor or Arher; Cytisus Cajan.

It is sown soon after the setting in of the rains, the feed being mixed with those of Jooar, Bajera, and other grain of the Khereef. When they are removed, the Cytisus remains, and its harvest is about the same time with the wheat.

5. Pease;
5. Pease; here called *Buttle*; ripe in the cold season.

Rice is cultivated only on a few detached spots, which lie conveniently for water, but the quantity is so small that it can hardly be reckoned among the crops. In a list I received of the cultivated grains, I find the name of *Cablee Channah*, but not having seen it, can give no account of it.

Barley is not cultivated; the soil is unfavourable to this grain, and besides, the farmers say, it would require artificial watering.

The principal articles of export trade are cotton, which is sent in large quantities to Guzerat; coarse flained and printed cloaths; *Att*, or the root of the *Morinda Citrifolia*, and opium. As the manner of preparing this drug differs, in some respects, from that which is practised in other parts of India, I shall give an account of it, which I received from some experienced cultivators. The poppy is sown in December. The ground is well manured with cow-dung and ashes. It is ploughed seven times, then divided into little squares, of two or two and a half cubits. In these the seeds are sown, in the proportion of one seer and a half, or two seers*, to a begah†. After eight or nine days, the ground is watered; that is, it is completely overflowed to the depth of a few fingers' breadth, and this operation is repeated, at the distance of ten or twelve days, for seven times. After each time of watering, when the ground is a little dried, but still soft, it is stirred, with an iron instrument, so as to loosen it effectually, and the weeds are carefully removed. Also, if the plants come up very close, they are thinned, so that the remainder may be at the distance of four or five fingers' breadth from one another. The plants thus pulled out, when very young, are used as a pot-herb; but

* The seer is eighty rupees weight. † One hundred cubits square.
when grown a little larger, as a foot and a half in height, are unfit for this use, from their intoxicating quality.

The poppy flowers in February, and the opium is extracted in March or April; sooner or later, according to the time of sowing. The white kind yields a larger quantity of opium than the red; the quality is the same from both. When the flowers are fallen off, and the capsules assume a whitish colour, it is the time to wound them. This is done, by drawing an instrument with three teeth, at the distance of about half a line from one another, along from top to bottom of the capsule, so as to penetrate the skin. These wounds are made in the afternoon and evening, and the opium gathered the next morning. They begin at day break, and continue till one p.m. of the day is passed. The wounds on each capsule are repeated for three successive days; the whole capsules in a field are wounded, and the opium gathered, in fifteen days. In a plentiful season and good ground, they obtain from six to nine seers of opium from a begah of ground: a small crop is from two to four seers.

In this district, all the opium, even at the time of gathering, is mixed with oil; and this they do not consider as a fraudulent adulteration. The practice is avowed, and the reason assigned is to prevent the drug from drying. The people employed in gathering it have each a small vessel containing a little oil of tefamum, or of linseed. The opium which has flowed from the wounded capsules is scraped off with a little iron instrument, previously dipped in oil. A little oil is taken in the palm of the hand, and the opium gathered with the iron instrument is wiped in the hand, and kneaded with the oil; when a sufficient quantity is collected in the hand, it is thrown into the vessel with oil. The whole quantity gathered is, when brought home, kneaded into a mass, and thrown into a vessel with more oil, in which the whole crop of the season
The proportion of oil in any given quantity of opium, is not determined with much accuracy; but they compute that the oil amounts to half the quantity of the pure drug, or one-third of the mixed mass.

The adulterations practised secretly, and considered as fraudulent, are mixing the powder of the dried leaves of the poppy; and sometimes even ashes.

When cheap, it sells for fifteen rupees; and when dear, or of a superior quality, for twenty-five or thirty rupees per d'hiree, a weight of 5½ seers, each seer being the weight of eighty rupees.

It is exported to Guzerat, Marwar, &c. The merchants from different parts of the country, advance money to the cultivator, while the crop is on the ground: when the drug is ready, they receive it, and settle the price according to the quality and the season. The plant is sown repeatedly on the same ground without limitation, as they find it does not exhaust the soil.

The mixture of oil renders this opium of a very inferior quality to that of the eastern provinces, and particularly renders it unsuit for making a transparent tincture.

Fine white cloths are imported from Chanderi and Sehor, and from Burhánpoor they receive turbans, and furies, and other stained goods. From Surat, are imported various kinds of Europe and China goods, many of which we purchase here at a cheaper rate than we could in the English Settlements. Also pearls, which are partly consumed here, and partly exported with advantage to Hindustan. Asa-fiateida, which is produced in Sind, and the provinces beyond it, comes here through
through Marwar, and is exported to the eastward to Mirzapoor, &c. On the other hand, diamonds from Bundelcund, go by this place to Surat.

But the carrying trade between the provinces to the west and the eastward is carried on to a much greater extent, and to more advantage at Indoor than here; because the duties there are lower. At that place only four or five annas are exacted on a bullock load, which may be worth three or four hundred rupees; whereas at Oujehin, they amount to ten per cent. on the value of the goods, exported or imported; so that on such articles as only pass through the place, the duties consume twenty per cent of the profit. The reason is obvious. Indoor had the good fortune to be under the prudent and peaceable administration of Aheliah Bai, a princess, who, free from ambitious views, had only the internal prosperity of her country, and the happiness of its inhabitants, at heart; whereas Sindiah, led away by the dazzling prospect of extending his conquests and acquiring great political influence, maintained expensive armaments, exhausted his treasury, and was forced to abandon his subjects to the rapacity of those who supplied the means of carrying his schemes into execution.

We remained at Oujehin from the middle of April to the middle of March, and so had an opportunity of observing nearly the whole vicissitude of seasons. In the month of April and May, the winds in the day time were strong and hot, the thermometer exposed to them being from 03 to 100, at four in the afternoon. These winds, with little deviation, came from the westward. The heat at nine in the evening varied from 80 to 90. But the mornings, during all this time were temperate, in only one instance rising so high as 81, and sometimes being as low as 69. From the 18th to the 25 of May, we had frequent squalls from N W and WNW; once from NE, attended with thunder, lightning,
ning, and rain. The quantity that fell during these eight days, amounted to about ten inches. This weather, the inhabitants informed us, was unusual at that season. It produced a temporary coolness; but the sky having cleared up before the end of the month, the air returned to its former temperature, or rather exceeded it, for the morning heat now sometimes mounted as high as 85.

On the 11th of June the rains set in, and the quantity that fell during the season was as follows:

<table>
<thead>
<tr>
<th>Month</th>
<th>Days</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>May,</td>
<td>5</td>
<td>10 inches</td>
</tr>
<tr>
<td>June,</td>
<td>9</td>
<td>3,521</td>
</tr>
<tr>
<td>July,</td>
<td>22</td>
<td>12,071</td>
</tr>
<tr>
<td>August,</td>
<td>22</td>
<td>21,088</td>
</tr>
<tr>
<td>September</td>
<td>9</td>
<td>5,051</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>67</strong></td>
<td><strong>52,331</strong></td>
</tr>
</tbody>
</table>

The rain terminated on the 14th of September. From the middle of June to the middle of July, the afternoon heat varied from 107 to 80, gradually diminishing as the season advanced, and sometimes from the continuance of the rain was as low as 80. The morning was more uniform, its extremes lying between 87 and 77. The evening, between 90 and 75. The weather, during this period, was constantly cloudy, sometimes hazy. The wind uniformly from the westward, varying from NW to SW.

From the end of this period, to the termination of the rains, the afternoon heat was from 89 to 74. The limit between the two periods was strongly marked, July the 15th, at P. M. being 91; 16th, at the same hour, 78. The morning, from 80 to 72. During this period, the clouds were so heavy and so uniformly spread over the whole face of the heavens, that the sun could
could seldom dart a ray through the gloom. The rain was frequent and long continued, but seldom heavy. The only instance in which the rain of one day amounted to so much as three inches, was in the space between the 15th of August, at 7 P. M. and the 16th, at 9 ½. The rain, during this period, of 26½ hours, was incelfant, and the quantity amounted to 10,128 inches. It then abated, but did not entirely cease till the 17th, at 4½ P. M. The quantity in that interval was 0,629. This it was which caused the inundation formerly mentioned. The waters continued to rise till the 16th at midnight, and then gradually subsided; but it was several days before the river was fordable by men or horses.

The winds, during this period, were most frequently west, sometimes N W or S W, twice S S W, four times south, and thrice easterly, commonly light breezes.

After the rains were over, and the sky cleared up the mid-day and afternoon heat increased. By the 23d of September, it was 92; October 1st, 101, and till the middle of November, was seldom under 90. The morning heat during that period gradually decreased from 73 to 46. The evening from 79 to 57. The dew towards the end of this period was very heavy.

The winds for the first two days continued at west; afterwards calm and light airs at NE to the end of September. To the middle of October, those of the NW quarter prevailed, of moderate force, but with frequent calms. To the end of the month the NE prevailed, and the mornings were hazy. In November, till the 6th, the westerly was the reigning wind, after which, to the 15th, the NE recovered its prevalence: the weather was less hazy than towards the end of the preceding month. On the other hand, during October,
there was not a cloudy day. To the 8th of November they were frequent; and on the 4th, a little rain fell: after that to the 15th the sky was clear, and the only two hazy mornings were in this period.

At this time (15th November) I was seized with a fever, which interrupted the meteorological observations till the 1st of February. All that I know of the weather during that interval is, that about the middle of December we had it stormy, with thunder and a pretty heavy fall of rain.

From the 1st of February to the 14th of March, when we left Oujein, the afternoon heat varied between the extremes of seventy-three to 103. The first, on Feb. 9th, with wind at NNW; the second, March 12th, wind west: sky at both times clear. Morning heat from forty-six to sixty-seven, evening from fifty-five to seventy-six.

The westerly were the prevailing winds during this period, varying between NNW and SSW. In February, the easterly wind was observed twice in the morning, four times at mid-day, and twice in the evening. It did not occur once during our stay in March. The sky was clear, excepting the 4th of February, which was cloudy with a shower of small rain.

The foregoing abstract gives a pretty distinct idea of the weather we met with during our residence at this place; but we cannot from thence form an estimate of the climate. The quantity of rain, in particular, was allowed by the oldest inhabitants to be greater than they ever remembered to have seen. The country had suffered three years of drought, previous to our arrival, in consequence of which wheat-flour sold at ten seers for a rupee. The coarser grains were proportionally dear, which placed the means of subsistence so far beyond the reach of the poorer inhabitants.
tants, that hundreds were reduced to the humiliating necessity of selling their children, to procure a scanty meal for themselves. But the deficiency of rain, though severely felt, was not the only cause of all this distress. The scarcity was artificially increased, by the rapacity of Cablee Mull, the person entrusted by Sindiah with collecting the revenues of the district. His wealth and influence enabled him to hoard up large magazines of grain, and thereby keep the price far beyond its natural standard. And when Sudasheu Naick, an eminent banker, whose disinterested benevolence deserves to be recorded by a much more eloquent pen, attempted to throw open his own stores, and sell the grain at a moderate price, no means of obstruction and intimidation, that the union of artifice with power could afford, were left unemployed, to make him desist from his purpose; so that he was obliged to confine the exertions of his humanity to feeding the poor at his own house; and in this manner thousands owed the preservation of their lives to his bounty.

The patient forbearance of the Hindu, under this dreadful calamity, has been noticed by several writers. In this instance, the indignation of the inhabitants at the unfeeling avarice of their rulers, could not be concealed. But, instead of breaking open their granaries, demolishing their houses, mal-treating their persons, or contumeliously burning them in effigy, the usual proceedings of an enraged European mob, they contented themselves with making a representation of funeral rites, and proclaiming that the Hakem was dead, and Sudasheu Naick appointed to fill his place.

The abundant rain which fell this season triumphed over all opposition. Before we marched, wheaten flour had fallen to twenty feers per rupee. The greedy monopolists saw those hoards which the anguish of the famished poor could not unlock, consigned to putrefaction,
faction, or selling at considerable loss, while the smile of plenty and content brightened the face of the peasant, in every part of the province.

Fever, chiefly intermittent, prevailed very generally, towards the end of the rains, and increased in frequency till the middle of November. A variety of causes contributed to their production. The debility, induced by deficient nourishment, predisposed the bodies of the poorer class to be acted on by every exciting cause. The unusual quantity of rain, and very moist state of the atmosphere, contributed to encrease the universal relaxation; the water, collected in standing pools, some of which of great extent, were close to the city wall, in drying up, left a putrid fomes; and, lastly, the great afternoon-heat in October and November, followed by the cold and damp of the evening, gave irresistible activity to the preceding causes, in constitutions which had hitherto resisted their influence. This it was which occasioned the universal prevalence of the disease among our sepoy and servants, after the 1st of October, when we left our habitations in town, and went into tents. Before the rains, we had encamped in a grove adjoining to the garden of Rana Khan; but when we marched out, this ground was covered with a crop of corn not yet ripe; and besides, it was low, and having been overflowed to a considerable depth, in the inundation, threatened to be mischievous by its dampness. The place we fixed on for an encampment, was near half a mile farther to the W N W. It was an elevated spot, to which the inundation had not reached, covered on the S W, by the small grove of Suh Dâwul, but perfectly open on every other side. The nearest part of the hilly ridge was at the distance of 2½ miles, the extremities of the ridge lying from N 10 W to S 60 W, or comprehending 110 degrees of the horizon. To the south and south-east, the Jeerah nullah was within a furlong, and a half of our tents. As it had swelled to a considerable height during the rains, and was now gradually drying up, it was natural to
to look for the source of miasma in putrefying vegetable matter left on its banks. But its bottom and banks were a stiff clay, affording little matter of this kind; and the prevailing winds from the beginning of October to the middle of November, were the N W, W N W, and N E, none of which could convey exhalations from the nullah. Therefore we are obliged to look for some other cause of the prevailing epidemic, and one amply sufficient, I apprehend, will be found in the want of cover, to protect the men against the scorching heat of the day, and the chilly damps of night. They themselves at length became sensible of the unhealthiness of the spot, although they entertained superstitious notions of its cause, ascribing it to the indignant manes of those who were slaughtered in the battle formerly described. At their request, some time in December, the camp was removed into the grove near Rana Khan's garden, from which the crop had, by this time, been carried off. I was then incapable of observing the effects of this change, but have been informed that the disease rapidly declined and soon disappeared. This fact pleads strongly in favour of an opinion advanced by*Dr. Jackson, that clear elevated situations, notwithstanding the free circulation of air, are, from unavoidable exposure to the morbid causes above enumerated, less favourable to health than has been supposed; and that "instead of danger, there is safety, in the shelter of wood." The question is of the highest importance, the Doctor supports his argument with ability, and the whole passage deserves the most serious consideration of those who are entrusted with the choice of ground for the encampment of troops.

The only complaint which I observed to be endemic, was the Dracunculus or Guinea worm, the history of which is too well known to require any

*Treatise on the Fevers of Jamaica, Chap. IV. p. 83—88. description
description in this place*. It is called by the Spaniards, Cullebrilla or little serpent, and seems to be the same that is described by M. De la Condamine, and known to the French at Cayenne by the name of Ver-macque. The only difference between the descriptions of the insect in these different countries, is in their length; those of Cayenne, being only said to be several inches; whereas those of Africa and the East Indies are known to amount to some ells. And this diversity in the description by different authors, is probably rather owing to the accidental circumstance of the specimens that fell under the observation of each, than to any real variety, or specific difference, between the animals of the two continents. The name by which they are known at Oujein, and I believe, in other parts of Hindustan is Neruah.

The cause of their production is still involved in obscurity. I have met with three hypotheses to account for it. 1st, That it is caused by the malignity of the humours deposited and fixed in some part of the cellular texture. This I was surprized to see assigned as the most probable, by the authors of the French Encyclopedia; after the doctrine of equivocal generation had been so compleatly refuted, and universally abandoned. 2dly, In Dr. Rees's edition of Chambers’s Dictionary, I find it ascribed to the drinking of stagnant and corrupt water, in which it is probable the ova of these animals lie. 3dly, It has been alleged that certain insects, which inhabit the air, or the water, in those coun-

* Filaria medinensis LIN. S. N. CUR GMELIN.
Gordius medinensis SYLT. Nat. ed. xii.
Vena medinensis WELSCH. SLOAN.
Dracunculas perforum KEMPFER.

The last author gives a very interesting history and description of the animal, which he says he was twice able to extract at one operation, entire and alive. Thrown into warm water it became flaccid and motionless: being taken out, it was more rigid and moved obdurately: but when immered in cold water, it bent and moved itself violently, and as if impatient of the cold liquid, frequently raised its head above the surface. Amœn. exot. p. 324 et seq.
tries, pierce the skin, and deposit their ova, which produce the worms in question.

Without pretending to decide between the two suppositions; or adverting to the difficulty of conceiving how the ova could preserve their vivifying principle, through the processes of digestion, chilifaction, and circulation, till they are finally deposited, by the capillary arteries, in the cellular texture; the observation that these insects are only found in the extremities, and most frequently in the lower, which are most exposed to immersion in stagnant water, pleads strongly in favour of the third hypothesis. The following fact renders it probable, that the generation and the growth of the worm, after the ova have been deposited, is very slow. Although the complaint was very frequent among the inhabitants of Onjein, our people remained exempt from it, during our residence there, for eleven months; but in the month of August following (five months after we left the place) the disease broke out in many. In all the cases which fell under my observation, the worm was lodged in the lower extremity, excepting one instance. This patient, who was a bhilltee, or water-man, had the complaint break out in his arm. The nature of his profession exposed his arms, more than those of other people, to the attacks of the parent insect: supposing her to reside in the water.*

* Dr. Chisholm ascribes the disease, which is very prevalent among the negroes in Grenada, to their drinking the water of certain wells, in which the naked eye distinguishes innumerable animals. On one estate, where no other water can be had, they are attacked regularly every year, about the month of November; in the month of January, the disease spreads through the greatest part of the gang; and in the month of March, it entirely disappears, till the following November. On other estates, the disease was equally frequent, till the obnoxious wells were filled up, cisterns built, or were dug in places not subject to the influence of the ebb and flow, of the tide; at the return of the usual period of the appearance of the Guinea worm, nothing of the kind happened. This is a strong proof that the insect which produces the worm resides in the water, but it is equally reconcilable to the supposition that the ova are deposited under the skin, when any part of the external surface is immersed in the water, as that of their propagating after being swallowed with the drink. As we know that most insects have
The method of extraction, practised by the natives at Oujein differs in nothing from that described by authors; except that in the operation of gently pulling, and rolling it on a pin, when they feel a resistance, they have recourse to friction, and compressing the part in various directions. This is not confined to the tumour, but extended over the limb to some distance. It is said to loosen the worm from its adhesions to the subcutaneous parts, and thus facilitate its extraction, and thus facilitate its extraction. In the American process, the rubbing of the wound with a little oil, is taken notice of, but that seems to be adopted with a different view. The accident of breaking the worm, was in some instances followed, by violent inflammation and tedious suppurations, breaking out successively in different parts of the limb; but I did not hear of any instance of mortification from this cause.

March 1793.—The resident having received instructions to return to Hindustan, on the 14th of March 1793, proceeded to Gutteah, a village under the management of Appah Khandey Raw. It lies from our camp at Oujein N 27 E, 14.79 miles. The road was in general good, over an open well-cultivated country. Only, in crossing three ridges of rising ground, the number of stones gave some impediment; and we forded three nullahs, the banks of which being steep, rendered the passage of carriages difficult.

March 15.—Marched N 15 1/2 E, 16.5 miles, to Tenauriah, a village possessed by a Grajiah zemindar, who holds of Sindiah, and pays between three and and four thousand rupees annually.

have certain stated seasons for procreation, we can easily account for the periodical recurrence of the disease; but I could not learn at Oujein that it observes any such regular alternation in that climate. Dr. C. observes, that the worm in Grenada is not confined to the extremities.

Chisholm on the malignant pestilential fever, p. 34.
March 16.—Marched N 12 E, 10,53 miles to Ager, a large town, with a stone fort, belonging to Rung Row Powar. To the south-west of the town is a fine lake. The road in general good, soil reddish or iron coloured.

March 17.—Marched N 12 3/4 E, 16,59 miles, to Soojineer, a pretty large town, belonging to Sindiah, and under the management of Appah K, Handey Raw, whose amil resides here. The road lies across several low ridges of hills, and is in general full of little stones. The soil of a rusty iron colour, very little cultivation.

March 18.—Marched N 17 1/2 W, 14,5 miles, to Parawa, a town belonging to Tuckojee Holcar, whose amil resides here. Road good. Soil black and spongy, like the most of Malavu, but little cultivated. The district dependent on this town yields one lack of rupees annually.

March 19.—Marched N 20 1/2 W, 15,91 miles to Soonel. The road and soil, on this day’s march, much the same as yesterday. A good deal of Joor stubble by the road side, and some wheat, now ripe.

Soonel is a town of considerable extent, of a square form, and enclosed with a stone wall. Two broad streets cross one another, at right angles, in the middle of the town, which is the Chowk. There are thirty-two villages in this pergunnah, which is held as a jageer by K, Handey Raw Powar, the elder brother of Rung Raw Appah.

March 21.—Marched N 4 1/2 E, 16,05 milesto Julmee. Road in general good. Passed the How river, and two nullahs. The ford of the first, being very stony, is difficult. Soil black. Much cultivation of wheat and poppy. Julmee is a pretty large village, which was assigned by the Peshwa, as a jageer, to Naroojee-
NAROOJEE-GONEISH, formerly dewan to the soubahdar HOLCAR. Since the death of Naroojee it has been held by Holcar himself. Several villages, between Soonel and this place, belong to the rajah of Kotah.

March 22.—Marched N 5½ W, 15,56 miles, to Muckundra. Road in general good; only, near the villages of Afcali and Telakhairee, it lies over a stratum of slate, which is very slippery. A good deal of poppy is cultivated near those villages. A begah, they say, yields about five feers of opium. Muckundra is a small village, situated in a valley, nearly circular, about three quarters of a mile in diameter, surrounded by very steep hills, and only accessible by an opening to the south, and another to the north; each of which is defended by a stone wall and a gate. At these gates are posted chokeydars, belonging to the rajah of Kotah. This is the only path, within many miles, through a ridge of mountains, which extends to the east and west, dividing the province of Málava from the district called Haroutee, or country of the tribe Hára. The water here is got from a large bawley, or well faced with stone. It is said, by the natives, to be of a hurtful quality; and that such as drink it for the first time are liable to fevers. Chundkhaiiree, where at this season of the year is a large market for horses and other cattle, is distant from this place seven coss to the eastward.

March 23.—Marched N 36½ W, 17 miles, to Puchpahár. The path through the hills was narrow and stony; the road afterwards good. Near Puchpahár passed over a bed of Schistus, in strata inclined to the horizon. The country rather thinly cultivated; a good deal of grass by the road side.

March 24.—Marched N 18¼ W, 8,64 miles, to Anandpoor, a small village, near which is a large tank, with a stone wall, and buildings on the bank of
of it. Road good, through a jungle of plafs* and other shrubs. Soil of a reddish colour: little cultivation. Close to Anandpore, the road runs over a stratum of Schifflus.

March 25.—Marched N 8½ E, 5,17 miles, and encamped in a tope, among gardens, near the city of Kotah. Road in general good; in some parts a stratum of Schifflus. This city is of considerable extent, of an irregular oblong form, enclosed with a stone wall and round bastions. It contains many good stone houses, besides several handsome public edifices. The palace of the rajah is an elegant structure. The streets are paved with stone. It has, on the west, the river Chwakul, and on the north-east, a lake, smooth and clear as crystal, which, on two sides is banked with stone, and has, in the middle, a building, called Jug-mandul, which is consecrated to religious purposes.

Near the north-east angle of the city, and only separated from the lake by the breadth of the road, is the Chetree or mausoleum of one of the Rajahs. It is a handsome building; the area on which it stands is excavated, so as to be several feet lower than the level of the country; and paved with stone. In front of the building are placed several statues of horses and elephants hewn out of stone.

To the south of the city, about three furlongs beyond the wall, is a place, consecrated to the celebration of Ram's victory at Lanka, on the Dufjerak, or 10th of Koonar Suku pusti. There is a square terrace of earth, raised about two feet above the ground, and at a little distance to the south, an earthen wall, with a few round bastions. Behind this, in a recumbent posture, is an enormous statue of earth, which represents the daemon Rawoon. On the day above named, all the principal people assemble at this terrace, on which some guns are drawn up. Their fire is directed against the earthen wall, and continues

till that is breached, and the image of Rawoor defaced or demolished.

The revenue of Kotah is thirty lacks of rupees; out of which is paid, though not regularly, a tribute of two lacks yearly to Sindiah, and as much to Holcar. The present Rajah is named Ummeid Sing. His uncle, who was his immediate predecessor, was assassinated about twenty or twenty-five years before, by his Dewan Zalim Sing, a Rajpoot of the tribe Jhula. He feigned, and still retains the administration; having left nothing but the name and pomp of Rajah, to the present incumbent. The Rajah's family is of the tribe Hará.

We halted here two days, which were employed in receiving and paying visits; and on the 28th marched N 21½ E, 6,29 miles, to Gowmuch. The road good, but the bed of the Chumbul, which we forded at Gowmuch, was stoney, uneven and slippery. This is a small village, dependent on Patan, from which it is distant one cofs. Patan contains some considerable buildings, erected by the Rajahs of Boondee, viz. a palace, and a temple dedicated to Veeshnool. It is the head of a pergunnah, containing forty-two villages, and belongs half to Sindiah and half to Holcar.

March 29.—Marched N 43 W, 9,6 miles, to Teekeree, a village belonging to Sindiah, dependent on Patan. Road good. Soil greyish. A good deal of jungle by the road side.

March 30.—Marched N 56½ W, 11,2 miles, to Boondee. Road in general good, but broken ground on both sides of it. In some places stoney. Little cultivation, much jungle.
The town of Boondee is situated on the southerly declivity of a long range of hills, which runs, nearly from east to west. The palace of the Rajah, a large and massively building of stone, is about half way up; and a kind of stone fortification runs to the top of the hill. The path, through the hill, lies to the eastward of the town, and is secured by a gate, at each end.

The Rajah, named Bishun Sing, of the tribe Hisa, is aged nineteen or twenty. His family and that of Kotah, are nearly related. That of Boondee is the elder branch, and was formerly the chief, in point of power: but its possessions have been reduced, by the irruptions of the Mahrattas, and encroachments of the Kotah family, to the revenue of six lacks; of which even a fourth part, or chout, is paid to the Mahrattas; one half to Sindiah, and the other half to Holcar.

March 31.—Marched north, 10.28 miles, to Dubliana, a pretty large village in the district of Boondee. Road in general good. Soil grey and light: very dusty: little cultivation. Much jungle, consisting chiefly or Pulüfa (Butea frondosa), Bobool (Mimosa nilotica), Careel or Teantee (a species of Capparis), and Jand (Adenanthera aculeata), of Doctor Roxburgh, described by him in the Asiatick Researches, Vol. IV, under the name of Prosopis aculeata."

April 1.—Marched N 69 E, to Doogaree, a pretty large village belonging to Boondee. It is nearly surrounded with hills, and has, to the westward, an extensive lake. On the bank, where it joins to the village, is an old house of the Rajah, on a pretty high hill; and on the extremity of a promontory, that runs into the lake, is a temple consecrated to Ma'hadeo. Great part of the road on this day's march lay over Schilfus, the strata, of which were nearly vertical:

and numerous little pieces of quartz lay scattered on the ground.

In the lake, with its leaves floating on the water, grows a species of *Menyanthes*, here called *Poorein* or *Teepee*. The hills round the edge of the lake are composed of *Schistus*, disposed in the same vertical strata as that on the road. The promontory that runs out into the lake, has a vein of quartz running across it. On these hills, I found the *Hees* (*Capparis Sepiaria*), the *Hinguta* (a new genus of the order *Decandria Monogynia*), which has been described by Doctor Roxburgh, under the Hindu name *Garu*), and the *Evolvulus* which I formerly observed to abound on the hills of *Dholpore*, *Gualior*, and *Ditteah*.

April 2.—Marched N 62° 4' E, 12,42 miles, to *Bahmen-gaung*, a village enclosed by a mud wall, with bastions. It belongs to *Aheliah Bai*. Road over the same vertical oblique strata of *Schistus* as yesterday; with similar little pieces of quartz, scattered on the surface. Little cultivation. Low forest, chiefly the *Butea-frondosa* by the road side.

April 3.—Marched N 25° E, 10,8 miles, to *Ooniara*. The road pretty good: little cultivation, and not much jungle; but a dry plain, in which the soil is grey, and very dusty.

This is a large town, surrounded by a wall, partly of mud, and partly of stone. Within the stone enclose is a handsome house of the Rajah. Round both walls runs a ditch. The Raw or Rajah is of the tribe *Nirooka*, and a feudatory of the Rajah of *Jynagar*. The present one, named *Bheem Sing*, is only twelve or fourteen years of age. The tribute paid to *Jynagar* is 35,000 rupees to the Sircar, and 5,000 to the officers of government.
As we are now entered on the territories dependant on Javanagar or Ambhér, some account may naturally be expected of the family, which for a long series of ages has held dominion over them. The following particulars rest on the authority of Xavier de Silva the confidential servant of the present Rajah.

The tribe of Rajputs to which this family belongs, is named Cuchzwáha, and is of the Suryabans, or children of the Sun; being descended from Ráma, the celebrated Rajah of Ayodhya.

Ráma had two sons, one named Loh, the other Cu'sh; the descendants of Loh are named Bud-Gu'ber, and the descendants of Cu'sh, Cuchzwáha. From Cu'sh, the Javanagar chronologers reckon 210 Rajahs, in succession, to Prit,hi-Raj, who succeeded to the musiud of Ambhér in Sumbut 1559, or A.D. 1502; and died in Sumbut 1584, having reigned twenty-four years, eight months, and twenty days.

Prit,hi-Raj had eighteen sons.
1. B,ha'ramul, who succeeded him.
2. Bhi'm, established the Raj or Nirwir.
3. Sa'ncají who built Sanganér,  These four left no descendants.
4. Raimul,
5. Bhi'm-pa'l,
6. Muctají,

To the remaining twelve sons, Prit,hi-Raj, to avoid the contention which he forswore was likely to happen after his death; assigned, in his lifetime, portions of territory, which descended to their offspring, and are called the twelve chambers, (Cut,hi) of the house of Cuchzwáha.
The names of these sons, of the families descended from them, of their districts and their present chiefs, together with the number of troops they can furnish, are as follow:

<table>
<thead>
<tr>
<th>Sons of</th>
<th>Families descended from them</th>
<th>District or Cut. bri.</th>
<th>Force in horse &amp; foot</th>
<th>Present Chiefs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prithi-Raj.</td>
<td>Nat bazat, Purimulout.</td>
<td>Samut,</td>
<td>10,000</td>
<td>Rawul Inder-Sing.</td>
</tr>
<tr>
<td>7</td>
<td>Gopal, his son Natha</td>
<td>Purimulout.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Purimul</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Jugmal, his son Cunwar</td>
<td>Cungarout</td>
<td>Samutar,</td>
<td>2,000</td>
</tr>
<tr>
<td>10</td>
<td>Bijalun</td>
<td>Bijalun</td>
<td>Nibalab,</td>
<td>7,000</td>
</tr>
<tr>
<td>11</td>
<td>Sultan, Chaterbhuj</td>
<td>Sultanout, Chaterbhuj</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Bulbuddarout</td>
<td>Bulbuddarout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Calian</td>
<td>Calianout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Rupsi-Beyrages, Shamin-Das, Puran-Sing, Ram-Sing</td>
<td>His descendants were settled in the zillah of Ajmer about Rupnagar whose descendants were Putteh-Sing and others in Nirwir.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>District Babila</td>
<td>Sabun, Cut bra</td>
<td>Of these four sons no descendants are now remaining.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gopatout,</td>
<td>Mabar, Wangob, Beider, Banskabua,</td>
<td>41,000</td>
<td>Rawul Bukhtawur Sing.</td>
</tr>
<tr>
<td>Bulberputa, Subaramputa, Cumbbani,</td>
<td></td>
<td>2,000</td>
<td>T, bakur Gulab-Sing.</td>
</tr>
<tr>
<td>41,000</td>
<td>2,000</td>
<td>7,000</td>
<td>5,000</td>
</tr>
<tr>
<td>57,000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

But the whole families descended from the Rajahs of Ambher, are in number fifty-three; of which the principal (besides those already enumerated) are;

Rajawat,
Rajawut, of which family is the present Rajah. They are the descendants of the Rajah Man-Sing, and were at first distinguished by the name of Man-singout.

Sekbarawut, — — 15,000

Niruca, — — 30,000

Hamirdeka Madbani, &c. 20,000

The Tekur of Jinh-bua, with others of less consequence.

Raw Rajah Bukhtawar-Sing, of Maccerti, and the Rajah of Unara.

Hamirdeka Madbani, &c. 25,000

147,000

The succession the Rajahs of Ambher from Prit,hi-raj to the present time, is as follows:

Prit,hi-Raj — — A. D. 1502

Bharamul

Bhugwunt-das

Man-Sing

5 Jugut-Sing

Maha-Sing

Jey Sing I

Ram Sing

Kishen Sing

10 Bishen Sing

Jey Sing II furbamed Seway; was seated on the musnad in Sumbut 1750, the 10th of Phalgun Krishen Puesh; and died in Sumbut 1800.

Ishri Sing

Madu Sing

Prit,hi Sing

15 Purtar Sing.

From Prit,hi-raj to the present time, being a period of 295 years, we have fifteen reigns, giving 19 years to each reign. If we allow the same length to each
each of the reigns from Cush the son of Rama, to Prit,hi-Raj: we shall place Cush about the year 2628 before Christ.

Next day, our tents were sent on, but stopped at a fort named Rampoora, distant six miles. This formerly belonged to the Rajah of Jynagur, and was by him assigned to the priest of Mobunt Jograj; but at the settlement made in 1791 with Tuckoje Holcar, this fort, with a territory of 60,000 rupees, was ceded to him. It still remained in his possession, and the command of it was entrusted to a Sekh, named Kirpal-sing. This man, hearing that we were going to the camp of Gopal Bhow, the general of Sindiah, with whom Holcar was then in a state of actual hostility, arrested our tents. No arguments could prevail with him to release them, till a letter was sent to Holcar, who was encamped at no great distance. He expressed great displeasure at the conduct of Kirpal-sing, and dispatched a junos, or messenger, with orders to attend our camp, and give peremptory orders to all his aumils, that none should presume to give us molestation.

The obstacle to our journey being thus removed, we marched on the eighth of April, N 47 E, 13,75 miles, to Burvárah, which belongs to a T,hakur, named Bickermajeet, of the family Rajáwut, a relation and tributary of the Rajah of Jynagur. This is a mud fort, with round bastions and a ditch.

April 9.—Marched N 39½ E, 9,3 miles, to Bhautwunt-gurh, a village situated at the foot of a hill, and having a small fort, or watch-tower, on the top of the hill. It is held by a Rajpoot T,hakur, named Abhey-sing, and is dependant on the district of Rintimbour, or the new city Madhoo-poor, which is five or six costs eastward. Road flony; in many parts
parts the fame perpendicular and oblique strata of Schistus as in some of the former marches. Very little cultivation near the road side, but a good deal of low jungle. Here I found, in considerable quantity, the Mimosa cinerea, conspicuous by its pink and yellow flowers. It is the same species that was found by Mr. Bruce, in Abyssinia, under the name of Ergett y Dimmo, or bloody Ergett, in allusion to which he proposes to call it Mimosa Sanguinea. The wood is laid to be very strong and durable.

April 10.—Marched N 32° 4' E, 10,94 miles, to Kheernee, a pretty large village, surrounded with a stone wall, belonging to Soorejmul, of the tribe Rajawut, whose chief place of residence is at Sowár, distant nine cols towards the south-west. Road in general good, but very heavy sand for half a mile, in the bed of the river Benás. No cultivation, except a few fields close to the village.

April 11.—Marched N 40° 5' E, 6,84 miles, to Mahirna, a mud fort, with a double wall, round battions, and a ditch. It belongs to the Thakoor Beiree-sal of Jehelain, which is said to be about fifteen cols off. Jynagur is reckoned from hence twenty-eight or thirty cols, Rintimbour eight cols, and the new city three cols further, in the same direction. Road good: the first part sandy; afterwards a blackish soil; now in stubble.

April 12.—Marched N 60° E, 18,30 miles, to Amergurh, a small village, with the remains of a fort, now in ruins. It was part of the jagheer of Dowlet Ram (since dead), the minister of Jynagur. Road sandy, near the end much broken ground.

For the direction of future travellers, it is necessary to remark, that by the misinformation of our guides, we were led to Amergurh, which is out of the straight road
road to Khoosh-hál-gurh. By stopping at Batudoh, Meenapára, or Mutchipoor, either of which villages was as large, and seemed as well able to supply our wants as Amergurh, we should have avoided the broken ground, shortened the whole distance, and divided it more equally.

April 13.—Marched N 71 E, 6 miles, to Khoosh-hál-gurh, a mud fort with double wall, round bastions, and a ditch; it belonged to Dowlet Ram, whose second son Hir-Narrain was then residing here; it was built by Khoosh-halee-ram, the elder brother of Dowlet Ram. Road sandy.

April 14.—Marched N 34 E, 11 miles, to Peelando, a large village (said to contain 1000 houses) belonging to Jograj Mahú’nt. A cheelah of his was living here in charge of it. Road to-day smooth: first part sandy, afterwards a firm clay. The corn all got in.

Jynagur is reckoned thirty cofs from hence, to the westward: Curonly eight cofs, about E S E; Khoosh-hál-gurh five cofs, and Hindoun seven cofs.

April 15.—Marched N 61 E, 17,12 miles to Hindoun, which has been a large city, and still contains pretty extensive buildings; but, from the depredations of the Mahrattas, is now very thinly inhabited. It belonged to Dowlet Ram, the son of whose maternal uncle was residing here. Road in general good: about half way, passed the dry bed of a river, which was deep sand. Much forest, especially in the first half of the road. Little cultivation.

April 16.—Marched N 49 E, 9,4 miles, to Suroot a large village surrounded with a mud wall, and having within it a square mud fort, with double wall and ditch. It belongs to Bijey Sing or Bijey Naut, of the
the tribe Sultánout. Road good: much jungle: little cultivation: sandy soil.

April 17.—Marched N 49° E, 11,42 miles, to Biana, which has been a large city, and included Agra among its dependencies. The town is still considerable, and contains many large stone houses; it was formerly the residence of a powerful Rajah, named Bijey-pal, of the tribe Jadoun, from whom the present family of Carouly is descended. But his principal city and fort was on the top of the adjoining hill, and the present town was only a suburb. The whole ridge of the hill is covered with the remains of large buildings, among which the most remarkable is a fort, called Bijey-mundur, containing a high pillar of stone, called Bheem-lat, or the Tealee or oilman’s lat or staff. This pillar is conspicuous at a great distance. The town and district now belong to Kamjeht Sing, the Rajah of Bhirtpoor. This prince is the son of the celebrated Sooraj-mul, head of the once powerful nation of the Jats. Having rendered essential service to Sindiah, about the time of his entrance into Hindustan, he has been treated with more indulgence than most of the native princes, and his possessions are still considerable, including three large forts, viz. Deeg, Bhirtpoor, and Combhère.

April 18.—Marched N 68½° E, 9,62 miles, to Rudawul, a village belonging to the same Rajah. Road good, and the country in a good state of cultivation.

April 19.—Marched N 62° E, 9,56 miles, to Kamua, a village also belonging to Bhirtpoor. Road good: country cultivated.

April 20.—Marched N 66¼° E, 9,59 miles, to Futtehpoor-Siri. Road good: country well cultivated. A range of stony hills for a good part of the way, close on the left. When we approach near to Futtehpoor, many ruins of tombs on the left.
Futtehpore is enclosed with a high stone wall, of great extent, built by the Emperor Akber. The space within does not appear to have ever been nearly filled with buildings, and the part now inhabited is but an in considerable village. This space is divided by a hilly ridge, of considerable elevation, which runs nearly from SW by W to NE by E, and extends beyond the enclosure, four or five miles on each side. These hills are composed of a greyish stone, and have supplied the materials of which the city wall is built.

Near the center of the enclosure, on the most elevated part of the rock, is built the tomb of Shah Selim Cheestee; by the efficacy of whose devotion, the Empress of Akber, after remaining for several years barren, became pregnant; and bore a son; who, in honour of the saint, was named Selim; and, on mounting the throne of Hindustan, assumed the title of Jehangeer. The approach to this mausoleum irresistibly impresses the mind of a spectator with the sensations of sublimity. The gate a noble gothic arch, in a rectangular screen of majestic elevation, stands on the brow of the hill towards the south. To this you ascend, by a flight of steps, the uppermost of which, being equal in length to the breadth of the screen, every one, in descending, is encreased, by the breadth of a step. Thus the whole forms half the frustum of a pyramid, the magnitude and simplicity of which, compared with the rugged surface of the rock, improves the grandeur of the prospect. From the top of this gate, the view of the surrounding country is extensive, and highly diversified. The mausoleum at Agra, at the distance of twenty-three miles, is distinctly seen.

By this gate, you enter into a square court, of 440 feet, within the walls. All around is a wide verandah, containing ranges of cells, for the accommodation of Dervishes. In the center, is a square building, of white marble, the sides of which are beautifully cut into lattice-work. The side of this, measured within, is forry-
forty-six feet. The verandah is about fifteen feet broad, on every side; and in the center is a small chamber, which contains the tomb; a neat sarcophagus, enclosed with a screen of latticed marble, inlaid with mother of pearl. The delicacy of the workmanship renders this an object of exquisite beauty.

Immediately to the westward of this, on the same ridge, is an ancient palace of Akber. It is a rude building, of red stone; and of so irregular a form, as not to be easily described. In one square court, the pavement is marked with squares, in the manner of the cloth used by the Indians, for playing the game called Pacheefs. Here it is said Akber used to play at this game; the pieces being represented by real persons. On one side of the court is a little square apartment, in the center of which stands a pillar; supporting a circular chair of stone, at the height of one story. The access to it is, by narrow ways of stone hollowed out, like troughs, which extend, from the four sides of the apartment, to the chair. Here the Emperor used to sit, and direct the moves of the people who represented the pieces, in the game above mentioned. Near to this, on the plain below, is a little circular tower, planted thick on all sides, and from top to bottom, with elephant's teeth; and terminated above, with a cupola, under which, it is said, the king used to sit, to view the combats of elephants.

Being now within a forced march of the conclusion of our journey, we marched a little after midnight (N 77° E, 22, 42 miles), and next morning, April 21, arrived at the mausoleum of Mumtaza Zemans at Agra; having been exactly fourteen months.

ADDENDUM TO THE NOTE, PAGE 8.

Such was the information obtained by the learned president; but Mr. Gilchrist, whose diligent researches into Hindustani philology have infinite merit (preface the dictionary, p. xxxiii,) on the authority of Goolzaar Ibraheem ascribes this little poem to Meker Qumur-ood'-Deen a native of Dabli, who was alive A. H. 1195 (A. D. 1781).
III.

An ACCOUNT of the INHABITANTS of the
POGGY ISLANDS, lying off SUMATRA.—
By John Crisp, Esq.

At a period when so many important voyages of
discovery have been recently effected, and such
various new countries and new races of men made
known, the account will, probably, appear too
trivial, to excite attention of either the merchant, the politician,
or the philosopher. There is however, one cir-
cumstance respecting the inhabitants of the Nassau or
Poggy islands, which lie off the West coast of Sumatra,
which may be considered as a curious fact in the history
of man, and as such, not unworthy of notice. From
the proximity of the islands to Sumatra, which, in re-
spect to them, may be considered as a continent, we
should naturally expect to find their inhabitants to
be a set of people originally derived from the Sumatra
stock, and look for some affinity in their language
and manners; but, to our no small surprize, we find a
race of men, whose language is totally different, and
whose customs and habits of life indicate a very distinct
origin, and bear a striking resemblance to those of the
inhabitants of the late discovered islands in the great
Pacific Ocean. It was a confused idea of this cir-
cumstance which first excited my curiosity, and in-
duced a desire to make a more minute inquiry into the
history of these people than hath hitherto been effected:
for, notwithstanding the vicinity of these islands to
an English settlement, we, as yet, had but a very imperfect knowledge of the inhabitants. An attempt had been made, between forty and fifty years past, to make a settlement among them, and to introduce the cultivation of pepper, but this design was frustrated, by the improper conduct of the person to whom the management of the business was entrusted. The imperfect account which was given of the people by the person appointed to go to the islands on behalf of the India Company, and another, not more satisfactory, by Captain Forest, are inserted in Mr. Dalrymple's India Directory; and, as far as I knew, these accounts constituted the whole of our knowledge of these islands.

The Naffau or Poggy islands form part of a chain of islands which lie off the whole length of the West Coast of Sumatra, at the distance of twenty to thirty leagues; the northern extremity of the northern Poggy lies in latitude 2° 18' S, and the southern extremity of the southern island in latitude 3° 16' S. The two are separated from each other by a very narrow passage called the strait of See Cockup, in latitude 2° 40' S. and longitude about 100° 38' East from Greenwich.

I left Fort Marlborough the 12th of August, 1792, in a small vessel, and made the southern Poggy on the morning of the 14th; coasting along which we reached the straits of See Cockup, where we came to an anchor at one o'clock the same day.

These straits are about two miles in length, and a quarter of a mile over: they make very safe riding for ships of any size, which lie perfectly secure from every wind, the water being literally as smooth as in a pond. The chief defect, as an harbour, is the great depth of water, there being twenty-five fathom close in shore, and forty-five fathom in the mid channel.
channel. While lying at anchor, we could plainly discern the high land of Sumatra. In the straits are scattered several small islands, each of which consists of one immense rock, and which probably was originally connected with the main islands. The face of the country is rough and irregular, consisting of high hills or mountains, of sudden and steep ascent; and the whole appearance of such islands, in common with Sumatra, bears strong marks of some powerful convulsion of nature. The mountains are covered with trees to their summits, among which are found species of excellent timber; the tree called by the Malays Bintangoor, and which on the other India is called Pohoon abounds here. Of this tree are made masts, and some are found of sufficient dimensions for the lower mast of a first rate ship of war. During my stay here which was about a month, I did not discover a single plant which we have not on Sumatra. The sago tree growing in plenty, and constitutes the chief article of food to the inhabitants, who do not cultivate rice; the cocoanut tree and the bamboo, two most useful plants, are found here in great plenty. They have a variety of fruits, common in these climates, such as mangosteens, pine-apples, plaintains, Buah, Chupah, &c. The woods in their present state are impervious to man; the species of wild animals which inhabit them are but few; the large red deer, some hogs, and several kinds of monkey are to be found here, but neither buffaloes, nor goats; nor are these forests infested, like those of Sumatra, with tigers or any other beast of prey. Of domestic poultry, there is only the common fowl, which probably has been originally brought from Sumatra: But pork and fish constitute the favourite animal food of the natives. Fish are found here in considerable plenty and very good. On the reefs of coral, which extend from the shore, and are frequently dry at low water, are found various kinds of shell fish, but I did not discover any which I had reason to suppose uncommon. The shell of a large species of nautilus, marked like zebra, is frequently
quently picked up on the shore of these islands, and having been informed that one of these shells with its fish in it would be acceptable at home, I offered the natives their own terms to procure me one, but they all assured me that it was absolutely out of their power to comply with my wishes; that the shell is frequently driven on the shore, but always empty; that it comes from the sea, and is not to be found on the rocks, and that no one on the island had ever seen one on the island had ever seen one of the shells in the state I required.

I found here species of cockle, the shell of which was enclosed in the most solid kind of coral rock; the aperture of the rock was sufficient to permit the shell of the cockle to open in some degree, but two small to permit removing it without breaking the rock. Having found them of different sizes, and it being a species of the Keemoo which grows to a very large size, it should seem that the cavity of the rock increases as the fish grows. If, according to Mr. Hunter's theory, the animal has a power of absorbing part of its own shell, this power may perhaps extend to the rock which contains it, and whose subsistence is of a similar nature.

Near the entrance of the straits of See Cockup on the northern island, are a few houses inhabited by some Malays from Fort Marlborough, the place is called Toongoo: these people reside here for the purpose of building large boats, called Chuneahs, the timber and planks for which are found close at hand. Among these Malays I found one intelligent man, who had resided two years at this place, during which he had acquired a competent knowledge of the language of the natives. I had also brought an interpreter with me who spoke the language some time at Padang, a Dutch settlement on the West Coast of Sumatra, where he had acquired some knowledge of the Malay tongue; by means of these people I was at no loss for communication with the natives, and
and had an opportunity of having the accounts confirmed by making use of the different interpreters.

The name of Nassau has probably been given to these islands by some Dutch navigator. By the inhabitants themselves they are called Poggy, and the natives are called by the people of Sumatra, Orang Mantawee; this latter is probably from their own language, Mantao signifying a man.

After having been two days at an anchor, the natives began to come down from their villages in their canoes, bringing fruit of various kinds, and on invitation they readily came on board. The chief of See Cockup, a village in the straits, was among them, but not distinguished from the rest by dress, or dignity of demeanor. On coming on board the vessel they did not shew any signs of apprehension or embarrassment, but expressed a strong degree of curiosity, and a desire to examine every thing minutely. We presented them plates of boiled rice, which they would not touch till it had been previously tasted by one of our own people; after which they eat it to the last grain. This circumstance seemed to indicate the use of poison among them. They behaved while on board with much decorum, and did not shew the least disposition for pilfering, but freely asked for what they saw and wished to possess; not expressing however any ill will, when they met with a denial. We made them presents of beads, small looking glasses, Birmingham japanned snuff boxes, &c. all which were very acceptable, as was also tobacco, of which they appear to be very fond; they use it by smoking. They appeared to live in great friendship and harmony with each other, and voluntarily divided among their companions what was given to them.
ing which time they behaved with much quietness, they returned to their village; and after this we were daily visited by many of their canoes, bringing fruit, a few fowls, &c. Several canoes came alongside the vessel with only the women in them; they at first expressed some apprehension at coming on board; but their men far from shewing any disapprobation, rather encouraged them to come into the vessel, and several ventured up the side. When in their canoes, the women use a temporary dress to shield them from the heat of the sun; it is made of the leaves of the plan-tain tree, of which they form a sort of conical cap, and there is also a broad-piece of the leaf fastened round their body, over their breasts, and another piece round their waist. This leaf readily splits, and has the appearance of a coarse fringe. When in their villages, the women, like the men, wear only a small piece of cloth round their middle. Among them we observed some of a very pleasant countenance, with fine expressive eyes. Mr. Best, a military gentleman of the establishment, with whose company I was favored on this trip, went up to one of their villages, attended only by the Malay interpreter and a Malay servant. He was received with great cordiality and civility, and stayed two nights at their village. Many of the people had never before seen an European, and with much curiosity examined his dress, particularly his shoes.

During a stay of about a month among them I collected the following particulars, respecting their manners and customs, the truth of which I was careful to have confirmed, by making my enquiries of different persons, and by the means of different interpreters.

The inhabitants of Poggy islands are but few; they are divided into small tribes, each tribe occupying a small river, and living in one village. On the northern Poggy are seven villages, of which Cockup is the chief; on the southern Poggy are five. The whole number of people on the two islands amounts, by
by the best accounts I could procure, only to 1400; the inland parts of the islands are uninhabited. Porah or Fortune island is inhabited by the same race of people, and is said to contain as many inhabitants as the two Poggys. When we consider the mildness of the climate, the ease with which the inhabitants procure wholesome nutritive food, and the little restraint laid on the communication between the sexes, this paucity of inhabitants seems to indicate that the period when their residence in these islands commenced, cannot be very remote. Their houses are built of bamboos and raised on posts; the under part is occupied by poultry and hogs, and, as may be supposed, much filth is collected there. The whole of their clothing consists of a piece of coarse cloth, made of the bark of a tree, worn round the waist, and brought across between the thighs; they wear beads and other ornaments about the neck, of which a small green bead is the most esteemed: though cocoa-nut trees are in such plenty, they have not the use of oil; and their hair, which is black, and might grow long and graceful, is, for want of it, and the use of combs, in general matted and plentifully supplied with vermin, which they pick out and eat; a filthy custom, but very common among savage people. They have a method of filing or grinding their teeth to a point, which is also in use on Sumaira.

Their stature seldom exceeds five feet and a half, and many among them fall short of this: some of them are extremely well made, with fine turned limbs and expressive countenances: their colour is like that of the Malays, a light brown or copper colour. The custom of tattooing or imprinting figures on the skin is general among them, of which I shall say more presently.

The principal article of their food is fago, which is found in plenty on these islands. The tree, when ripe is cut down, and the pith which forms the fago, taken
taken out, and the mealy part separated from the fibrous, by maceration and treading it in a large trough continually supplied with fresh water: the meal subsides and is kept in bags made of a kind of rush; and in this state it may be preserved for a considerable time. When they take it from their store for immediate use, some further preparation of washing is necessary; but they do not granulate it. One tree will sometimes yield two hundred pounds of fago: when they cook it, it is put into the hollow joints of a thin bamboo, and roasted over the fire.

Besides this article, they have a variety of nourishing plants, such as the yam, the sweet potatoe, the plaintain, &c. Their animal food consists of fowls, hogs and fish; shell fish they eat raw. The use of betel, so common in the East, is unknown to them, and I observed in many marks of the scurvy in their mouths.

Their arms consist of a bow and arrows. The bow is made of the Neebong tree, a species of palm, which, when of a proper age, is very strong and elastic; the string is formed of the entrails of some animal; the arrow is made of a small bamboo or other light wood, headed with brass, or with another piece of wood fixed to the end of the shaft and cut to a point: these arrows, we were told, are sometimes poisoned. Though strangers to the use of feathers to steady the flight of the arrow, they nevertheless discharge it from the bow with much strength and skill. With a mongrel breed of dogs, probably procured originally from Sumatra, they rouse the deer in the woods, which they sometimes kill with their arrows; they also kill monkeys by the same means, and eat their flesh. We observed among them a few who were in possession of creeses or Malay daggers.

Their knowledge of metals is entirely derived from
from their communication with the inhabitants of Sumatra. They are still strangers to the use of coin of any kind, and a metal coat button would be of equal value in their esteem with a piece of gold or silver coin, either of which would immediately be hung about the neck as an ornament. A sort of iron hatchet or hand-bill, called parang, is in much esteem with them, and serves as a standard for the value of various commodities, such as cocoa nuts, coolit coys, poultry, &c.

We were informed that the different tribes of Orang Mantavee who inhabit the Poggy islands never war with each other; to which account we could readily give credit from the mildness of their disposition. Indeed the friendly footing upon which they appeared to live one with another was a circumstance too striking to escape our notice; during our whole stay with them, and while distributing various presents among them, we never heard a single dispute, nor observed one angry gesture. They however informed us that a feud has long subsisted between the inhabitants of the Poggy islands, and those of some island to the northward, whom they called Sybee. Against these people they sometimes undertake expeditions in their war canoes; but it did not appear that they had engaged in any undertaking of this kind lately. Mr. Best measured one of these war canoes, which was preserved with great care under a shed; the floor of it was twenty-five feet in length, the prow projected twenty-two feet, and the stern eighteen, making the whole length sixty-five feet; the greatest breadth was five feet, and the depth three feet eight inches. For navigating in their rivers and the straights of See Cockup, where the sea is as smooth as glass, they use a small canoe made from a single tree, constructed with great neatness, and the women and young children are extremely expert in the use of the paddle.

The religion of this people, if it can be said that they
they have any, may truly be called the religion of nature. A belief of the existence of some powers more than human cannot fail to be excited among the most uncultivated of mankind, from the observations of various striking natural phenomena, such as the diurnal revolution of the sun and moon; thunder and lightning; earthquakes, &c. &c. nor will there ever be wanting among them some of superior talents and cunning who will acquire an influence over weak minds, by assuming to themselves an interest with, or a power of controlling those super-human agents; and such notions constitute the religion of the inhabitants of the Poggy's. Sometimes a fowl and sometimes a hog is sacrificed to avert sickness; to appease the wrath of the offended power, or to render it propitious to some projected enterprise: and Mr. Best was informed that omens of good or ill fortune were drawn from certain appearances in the entrails of the victim. But they have no form of religious worship, nor do they appear to have the most distant idea of a future state of rewards and punishments. They do not practise circumcision.

The mode of disposing of their dead bears a resemblance to that of the Otaheitans. Very shortly after death the corpse is carried to a certain place appropriated for the purpose, where it is deposited on a sort of stagge, called in their language Rati Aki; it is dressed with a few beads or such ornaments as the person was accustomed to wear in his life time, and after strewing a few leaves over it, the attendants leave the ground, and proceed to the plantation of the deceased, where they fell a few trees of his planting, and return to their homes. The corpse is left to rot, and the bones fall to the ground.

Among a people whose manners are so simple whose wants are so easily supplied, and whose possessions are so circumscribed, we are not to look for any complex system of jurisprudence: indeed their code of laws may be comprised in a few lines.
Their chiefs are but little distinguished from the community, either by authority or by property, their pre-eminence being chiefly displayed at public entertainments, of which they do the honours. They have no judicial powers; all disputes are settled, and crimes adjudged, by a meeting of the whole village.

Inheritance is by male descent; the house or plantation, the weapons and tools of the father, pass to his male children. Theft, when to a considerable amount, and the criminal is incapable of making restitution, is liable to be punished by death.

Murder is punishable by retaliation; the murderer is delivered to the relations of the deceased, who may put him to death. I was however informed these crimes are very rare.

In marriages, the matter is settled between the parents of the young persons, and when agreed upon, the young man goes to the house of the bride, and takes her home; on this occasion a hog is generally killed, and a feast made. Polygamy is not allowed.

In cases of adultery, where the wife is the offender, the injured husband has a right to seize the effects of the paramour, and sometimes punishes his wife by cutting off her hair. When the husband offends, the wife has a right to quit him, and to return to her parent's house; but in this state of separation she is not allowed to marry another; however, in both these cases, the matter is generally made up, and the parties reconciled; and we were informed that instances of their occurrence were very unfrequent. Simple fornication between unmarried persons is neither a crime nor a disgrace; and a young woman is rather liked the better, and more desired in marriage, for having
having borne a child; sometimes they have two or three, when, upon a marriage taking place, the children are left with the parents of their mother. The state of slavery is unknown to these people.

The custom of tattooing is general throughout these islands. They call it in their language *teete.* They begin to imprint these marks on boys of seven years of age, but they only trace at first a few outlines. As they advance in years, and go to war, they fill up the marks, the right to which depends on having killed an enemy. Such is the account they gave us, and it is probable enough that this custom may originally have been intended as a mark of military distinction; but such original intention cannot at present have place, as the marks are common to every individual, and wars scarce occur once in a generation. The figures imprinted are the same throughout, or the variation, if any, is very trifling, excepting that, in some of the young men, the outline only of the broad mark on the breast is traced, but this is filled up as they grow older. The women have a star imprinted on each shoulder, and generally some small marks on the back of the hands. These marks are imprinted with a pointed instrument, consisting of a brass wire fixed perpendicularly into a piece of stick about eight inches in length: this piece is stuck with another small long stick with repeated light strokes. The pigment used for this purpose is made of the smoke collected from a species of resin, which is mixed with water; the operator takes a stem of dried grafts, or a fine piece of stick, and dipping the end in the pigment, traces on the skin the outline of the figure, with great steadiness and dexterity; then, dipping the brass point in the same composition, he with very quick and light strokes drives it into the skin, tracing the outline before drawn, which leaves an indelible mark. Mr. Best submitted to the operation on his leg, and found it attended with some pain.
Such are the customs and manners of the inhabitants of the Poggy islands which lie within sight of Sumatra. The many particulars in which they differ from any set of inhabitants of the latter island put it in my opinion beyond a doubt that they are of a different origin, but from whence they came it may not be easy, and probably will not be thought of importance, to trace. They have no clear tradition to assist in such an enquiry. When Mr. Best was at their village, on asking from whence they originally came, they told him from the sun, which he understood as signifying from the eastward.

As the sounds which express ideas are arbitrary, and it not being probable that people who have never had communication should hit upon the same sounds to express the same ideas, affinity in language may be considered as one of the surest indications of sameness of origin; but even in judging from this criterion, a variety of circumstances may render us liable to error. I have however subjoined a pretty copious specimen of the language of the Poggy islands.

But another circumstance, which I think might assist in tracing the origin of these people, is the figures used in tattooing their bodies; for as all the men are marked according to the same pattern nearly, if any people should be discovered among whom this custom prevails, and whose bodies are tattooed, generally, with figures of the same kind, it would afford no slight presumption of a common origin. I have therefore accompanied this account with a sketch of a man and a woman of these islands, as also a drawing of the instruments used in making these marks; the execution greatly needs an apology; but I am no draughtsman, and can only answer for the exactness with which I copied these figures.

I had
I had intended to have examined the whole chain of islands which lie off Sumatra, and which are inhabited by very different sets of people, but a number of cross and untoward accidents prevented the accomplishment of my original design.

SPECIMEN OF THE LANGUAGE OF THE POGGY ISLANDS.

| One   | Two    | Three | Four | Five | Six  | Seven     | Eight | Nine | Ten  | Twenty | An hundred | Mankind | A man | A woman | Father | Mother | Head | Eyes | Nose | Hair | Eye-brows | Eye-lashes | Ears | Teeth | Tongue | Chin | Belly | Hand | Foot | Blood | Day | Night | Sleep | Dead | White | Black | Good | Fire | Water | Earth | Stone-rock | Hog | Fowls | Bird | Egg | Fith | Sun | Moon |
|-------|--------|-------|------|------|------|-----------|-------|------|------|--------|------------|---------|-------|---------|--------|--------|------|------|------|------|--------|--------|------|-------|-------|------|-------|------|------|-------|------|-------|------|------|-------|------|-------|------|-------|
INHABITANTS OF THE POGGY ISLANDS. 91

<table>
<thead>
<tr>
<th>Moon</th>
<th>Lago</th>
<th>Prong or Hatchet</th>
<th>Taagla</th>
</tr>
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<tbody>
<tr>
<td>Stars</td>
<td>Panyean</td>
<td>Cocoa-nut</td>
<td>Toata</td>
</tr>
<tr>
<td>God</td>
<td>Saraloggye Saneetoo</td>
<td>To fight</td>
<td>Sagack</td>
</tr>
<tr>
<td>Naked</td>
<td>Tocomong</td>
<td>The Sea</td>
<td>Koat</td>
</tr>
<tr>
<td>To speak</td>
<td>Maneeboo</td>
<td>A large Boat</td>
<td>Kalaba</td>
</tr>
<tr>
<td>Here</td>
<td>Kai</td>
<td>A Canoe</td>
<td>Avauk</td>
</tr>
<tr>
<td>There</td>
<td>Kafau</td>
<td>Sour</td>
<td>Malaja</td>
</tr>
<tr>
<td>Come</td>
<td>Kai comong</td>
<td>Sweet</td>
<td>Makiki</td>
</tr>
<tr>
<td>Go</td>
<td>Kainang</td>
<td>Wood</td>
<td>Loven</td>
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<tr>
<td>Yes</td>
<td>Oho</td>
<td>The wind</td>
<td>Roofa</td>
</tr>
<tr>
<td>No</td>
<td>Tani</td>
<td>A bow</td>
<td>Logue</td>
</tr>
<tr>
<td>Hard</td>
<td>Makala</td>
<td>An arrow</td>
<td>Rorow</td>
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<tr>
<td>Soft</td>
<td>Mamama</td>
<td>Clouds</td>
<td>Boojoot</td>
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<tr>
<td>Rough</td>
<td>Mokara</td>
<td>Thunder</td>
<td>Salagoo</td>
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<tr>
<td>Smooth</td>
<td>Malooplooph</td>
<td>Lightning</td>
<td>Beela</td>
</tr>
<tr>
<td>Straight</td>
<td>Moipoiroo</td>
<td>Earthquake</td>
<td>Tataoo</td>
</tr>
<tr>
<td>Crooked</td>
<td>Tamaipoiroo</td>
<td>A Dog</td>
<td>Jojo</td>
</tr>
</tbody>
</table>

** NAMES OF PERSONS. **

** NAMES OF MEN. **

Rajah of Cockup,  
Mengriah  
Goolooh Tarah  
Marecat  
Jagula Kayoo  

** NAMES OF WOMEN. **

Nangfannee  
Talle Sheeboe  
Goryebooh  
Tamanneegal  

IV. OB-
OBSERVATIONS on the THEORY of WALLS, wherein some particulars are investigated which have not been considered by writers on fortification. By William Lambton, Lieutenant in His Majesty's 33d Regiment of Foot.

Mr. Muller, and others, in treating on the theory of walls, have considered the part of the wall ABCD which is above the ditch, as one piece of solid masonry, without having any reference to the part FGBH, which is sunk in the ground, and they have investigated the force necessary to sustain the earth BCT, in equilibrio, and have given dimensions for the wall ABCD, so as to equal the said force; but they have neglected taking into consideration the tenacity of the masonry in the line AB, where the wall is supposed to break off, and turn freely on the point A. On examining this subject it appears evident that, if the cement be good, a considerable additional force, to that which would equal the weight of the wall, resting against the point S, must be required to break the masts in the line AB,
AB, taking it for granted at the same time that the foundation HBGF is so fixed in the solid earth, as to require a force to move it, superior to that which is required to effect the breakage in the line AB: for otherwise the whole would turn on the point F, and must be considered as having no adhesion in the line FG; at the same time the force to separate it from the earth being estimated.

In order therefore to obtain the measure of such a force as is above stated, let A'B' and B'C', in the annexed figure, be of any given dimensions, and let a weight be applied to the point S' in the horizontal direction of the center of gravity R, of the triangle B'C'T' (which triangle represents the section of the earth resting freely against the wall) and determine by experiment, what weight will be necessary to break the wall, after deducting what would be sufficient to sustain the earth in equilibrio, whose section is represented by B'C'T' supposing there were no cohesion, and call that weight w—let w be compared with the above sustaining weight. Now since A is the point on which the wall is to turn, whatever force be required to separate one particle of the masonry in the line A'B', the momentum of that particle will be expressed by multiplying the particle itself into its distance from the point A'. And, from a well known property in the center of gravity, the momentum of all the particles in the line A'B' will be expressed by the line itself multiplied into the distance of its center of gravity from the point A'; which will therefore be defined by \( \frac{1}{2} A'B' \times A'B' = \frac{1}{2} A'B^2 \). Now, since the weight w is to be applied to the point S, the momentum of w will be expressed by \( w \times B'S' \); and
and this quantity, from the nature of the problem, must be as \( \frac{1}{2} A'B' \) : consequently, we have \( w \) as \( \frac{1}{2} \frac{A'B'}{BS} \). Now, this being determined, the weight \( w \) may also be determined which will break any other wall, under the like circumstances, whatever may be the dimensions of \( AB \) and \( BC \) (or \( BS \)) as in figure 1st. For seeing that it will be in the constant ratio of \( \frac{1}{2} \frac{AB}{BS} \) directly, and \( BS \) inversely, and if \( \frac{1}{2} \frac{A'B'^2}{BS} \) be called \( b \), we shall have \( W : w : \frac{1}{2} \frac{AB^2}{BS} \cdot b \), and \( W = \frac{1}{2} \frac{AB^2 \times w}{BS \times b} \), and therefore \( W \times BS = \frac{1}{2} \frac{AB^2 \times w}{b} \), the momentum of \( W \);—which quantity must be added to the momentum of the wall given by Mr. Muller.

Now, if \( AE = an \), \( EB = x \), \( BC = a \), and therefore \( BS = \frac{a}{x} a \), according to Mr. Muller's first profile; then \( \frac{1}{2} \frac{AB^2 \times w}{b} \times \frac{1}{2} \frac{na + x^2 \times w}{b} \); which added to his equations for stone walls, we have \( x^2 + 2na + 3n^2a^2 + \frac{1}{2} \frac{na + x^2 \times w}{b} \); which, therefore \( 2b + \frac{w \times x^2}{b} + 2b + w \times 2na = a^2 \times \frac{3}{10} 6s^2 b = \frac{1}{2} b + \frac{w}{x^2} + n^2 \); which, reduced, gives \( x = a \sqrt{n^2 + \frac{3}{10} \frac{6s^2 b - \frac{1}{2} b + \frac{w}{x^2} + n^2}{2b + w}} \) a general theorem for stone walls, whatever be the value of \( b \) and \( w \).

Since the specific gravity of stone to that of brick is as 5 to 4, if the above momentum for the wall be reduced in that ratio, or its equal \( (\frac{5}{10} \frac{6s^2 a^2}{b}) \) increased; there will arise \( x^2 + 2na + 3n^2a^2 + \frac{1}{2} \frac{na + x^2 \times w}{b} = \frac{1}{2} \frac{6s^2 a^2}{b} \), which reduced gives \( x = a \sqrt{n^2 + \frac{3}{10} \frac{6s^2 b - \frac{1}{2} b + \frac{w}{x^2} + n^2}{2b + w}} \) — or, a general theorem for brick walls.
In order to illustrate this theory by examples, it will first be necessary to obtain the value of $b$ and $w$ from experiment. Let then $ABCD$ be a wall of any small given dimensions, continued from the foundation $ABGF$, which is of the same piece of masonry with the wall, and well secured in the solid earth; and to prevent a fraction in any other part than in the line $AB$, let an inflexible iron bar be applied to the side $BC$, so that a force applied to any point $s$, may act upon the whole side at once; and for the purpose of preserving the center of gravity in a line that bisects $AB$ in $H$, (which will save trouble in the present computation) let there be another iron bar of equal weight to the former placed on the opposite side $AD$. Now let $Q$ represent the weight of the mass $ABCD$, including the two bars suspended at $H$. Then if $W$ be a weight, acting at $S$, by a line passing freely over the pulley $p$, and such as to sustain the wall and bars in equilibrio, supposing no cohesion in the line $AB$, we shall have $W : Q : : AH : AB \cdot BS$

and $W = \frac{AH \cdot Q}{AB \cdot BS}$; that is supposing $AB = 1$, $BC = 3$, and $BS = 2 = 4H$, $W$ will be $= \frac{3}{4} Q$. But $Q$ being as $AB \cdot BC$, is therefore $= 3$, in this instance, whence $W = \frac{1}{2}$. Now to determine the force necessary to overcome the tenacity, let an additional weight $w$ be applied to $W$, increasing it till it becomes sufficient for the purpose, which having a known proportion to the weight $W$, will also have a determinate proportion to $Q$. Suppose, for example, it were found $= \frac{1}{2} W$, then, $W$ being $= \frac{1}{2}$, $w$ becomes equal $\frac{1}{4}$. Now since

$b = \frac{1}{2} \cdot \frac{w}{h}$,

it becomes equal $\frac{1}{4}$ in this case: which two values of $b$ and $w$, being thus determined by experiment,
in the two foregoing equations. Hence \( a\sqrt{n^2 + \frac{16s^2b - 4b + w}{2b + w} \times n^2} - n \) becomes for \( a\sqrt{\frac{3s^2b}{2b + w} \times n^2} - n = a \sqrt{\frac{1}{3}n^2 + \frac{5s^2}{2} - n} \) for stone walls; and \( a\sqrt{n^2 + \frac{16s^2b - 4b}{2b + w} \times n^2} - n = a \sqrt{\frac{3s^2b}{2b + w} \times n^2} - n \) for brick walls. — If \( n \) be taken \( = \frac{1}{2} \) or \( 2 \); and the angle TBC \( = 45^\circ \), so that \( s^2 \) be \( = \frac{1}{2} \); then \( x = \frac{136}{a} \) for stone walls, and, \( 1211 \times a \), nearly, for brick walls, both considerably less than Mr. Müller's computations, if \( w \) should be found what is here supposed.

**LET A' B' C' D' be a wall of the same dimensions figure 3, with the addition of a counterfort B'C'F'E', which is continued to the bottom of the foundation G H. Then, since the breadth of a counterfort is \( \frac{1}{2} \) of the distance between each other, the weight applied at any point \( S \), sufficient to break the counterfort in the line B'E', will be \( \frac{b \times E'B + \frac{1}{2} b E'}{4b s} \), which being added to the former quantity for breaking the wall A'B'C'D' in the line A'B', gives \( w \) as \( \frac{1}{2} \frac{A'B^2}{b's} + \frac{b'E' \times \frac{1}{2} A'B' + \frac{1}{2} l'}{4b s} = b \). Hence the weight sufficient to break a wall of any other dimensions, will be \( \frac{2AB^2 + \frac{1}{2} BC \times AB + \frac{1}{2} BC^2}{4BC} \times \frac{aw}{b} \) and the momentum \( \frac{2AB^2 + \frac{1}{2} BC \times AB + \frac{1}{2} BC^2}{4BC} \times \frac{sw}{b} \), which if BE be \( = \frac{1}{4} BC \), will be \( \frac{2n^2a^2w + 4 na \omega + 2 + \frac{1}{2} n^2a^2 \omega + \frac{1}{2} aw + \frac{1}{2} aw}{4b} \) which must therefore be added to the momentum of the wall.
OBSERVATIONS ON THE

wall and counterfort given by Mr. Muller in his 3d
prob: from whence arises \(4b + 2w \times x^2 + 4b + 2w \times 2n + \frac{1}{2}b - \frac{1}{2}w \times x + \frac{1}{2}bn^2 + 2w \times a^2 + \frac{1}{2}b + \frac{1}{2}w \times na^2 + \frac{1}{16}b + \frac{1}{2}w \times a^2 = \frac{3}{2} b a^2 s^2\), which transposed and divided

by \(4b + 2w\), gives

\[
x = \frac{\sqrt{n^2 + \frac{2}{2} b - \frac{2}{2} w - 2 u(\times n^2)} - \frac{3}{2} + \frac{1}{2} - n + \frac{1}{2}}{4 + 2w}
\]

which is a general equation for stone walls; and by comparing the specific gravities, as in the former case, then \(x = a\)

\[
x = \sqrt{\frac{\frac{2}{2} b - \frac{2}{2} w + 2u(\times n^2)}{4 + 2w} - \frac{3}{2} + \frac{1}{2} - n + \frac{1}{2}}
\]

Now in order to obtain the value of \(w\), let \(Q\) represent the mass of the wall and counterfort together, suspended to a line passing through their common center of gravity, and which will cut the line \(AE\), we will suppose, in the point \(H\). Then, from the principles of mechanics, if \(c\) and \(d\) be the points in the line \(AE\), where lines passing through the respective centers of gravity of the two masses \(ABC\) and \(BCFE\), will intersect that line, we have \(Q = \frac{1}{2} AB + \frac{1}{2} BE\)

\[
Q = \frac{1}{2} AB + \frac{1}{2} BC \times BC \times BC = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{2}\).
\]

Whence \(A H = \frac{2}{2} + \frac{1}{2} = 1\) and \(\theta = 45^\circ\). Then again, by the laws of mechanics, as \(\frac{1}{2} \times (\frac{1}{2} AB + \frac{1}{2} BE + BS)\); \(\frac{5}{2} + \frac{1}{2} (\frac{1}{2} AH) = \frac{5}{2} \times (\frac{1}{2} Q)\)

\[
\frac{5}{2} \times \frac{1}{2} = W\] and consequently, \(\omega = \frac{1}{2} \times \frac{1}{2}\) nearly. Now \(b = \frac{\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} + \frac{1}{2} \times AB + \frac{1}{2} \times BC}{4}\) nearly, for stone walls, and \(x = 11\) nearly, for brick walls.
In estimating the value of \( w \) in these computations, I have supposed it to be \( \frac{1}{4} \) the weight \( (W) \) which would sustain the wall by which the experiment is made, \textit{in equilibriu}: this I suspect is below its value; particularly if the masonry be old. In ascertaining the value of \( w \) I would undoubtedly make various experiments with masses of masonry from one to four or five years standing, so as to compute for works whose walls may probably remain for so many years before they be closed up with earth. If the mortar be very good, the cohesion of a wall well built and seasoned, must become a very important object in the construction of large fortified places;—for by that the expense, as well as time and labour in the building, must be considerably reduced. To use no more materials than what are necessary should be a maxim in fortification, but then to determine the exact dimensions of any particular work, so that it may answer the purpose intended, and yet have no useless materials about it, must require a mathematical investigation before any rule can be obtained for proceeding upon solid and infallible principles. Engineers, to whom the direction of the most important works of a nation is intrusted, ought to be capable of determining what is precisely necessary to be done in all cases, that no useless expense may be incurred, but instead of having recourse to science, men in general, depend upon what they call experience; forgetting that in practice alone, there are no means for drawing general conclusions; but that we obtain, from \textit{experiment}, the requisite \textit{data}, to reason and generalize upon, and by such materials we are enabled to build a theory, to which practice must be ever subordinate and conformable. Should any circumstance occur in the course of practice that has not been considered in that theory, such circumstance should be then taken into consideration; but let no conclusions be drawn from thence, but what are correct and scientific. For to attempt to reason without principles; to substitute hypothesis for facts,
and fancy in place of philosophy, would be subjecting ourselves to innumerable errors. Hence it is, that in the construction of various compound machines, such frequent blunders are committed; for instance, where it is required to find the just proportion and dimension of the different parts of a machine, for raising water, &c., and the ratio of the weight to the power, so that the most work might be done in the least time possible, dimensions are generally taken from rules which apply only to a state of equilibrium, without having any recourse to velocity. And hence also, the mistaken practice of loading an arch, of whatever figure it may be, with the same mass of masonry, without knowing the principle of equilibration, whereby the extrado of any arch is to constructed, that every part of the arch shall sustain a pressure, just sufficient to retain it in its perfect form. But to enumerate the instances where theory is requisite, would be endless, because it would be difficult to mention one single case where it was not necessary. The great object to be attended to in founding a correct theory is, to include in the data every circumstance that can occur; and it is from this neglect, that in mixed mathematics, authors have sometimes differed in their results, though their mode of reasoning has been strictly mathematical. It is to be regretted that men of abilities have not paid more attention to experimental knowledge, where they have been in search of data for applying abstract reasoning to the rude operations of matter. Mr. Vince, one of the first mathematicians of the present age, is now opening a new path to the most valuable discoveries, by the best conducted experiments that have yet been communicated to the world, respecting friction, and the resistance of fluids. By the former he has discovered very different laws to what have been followed hitherto, and which, when considered and applied to compound machines, whose effects after being put in motion are investigated, will tend greatly to complete the science of mechanics. His experiments last mentioned
tioned lead to improve a subject the most abstruse and difficult in the whole science of physics. Many of our first mathematicians, since the immortal Newton shewed the way, have investigated, with the greatest perspicuity and elegance, a great variety of theorems concerning the resistance of bodies moving in fluids; but for want of knowing the law of resistance, their conclusions have differed very considerably from those experiments that were made to ascertain their truth. Doctor Hutton after making many experiments at Woolwich, in the year 1786, in order to prove the results of several interesting problems which he has given in his select exercises, where he allows the law of resistance to be in the duplicate ratio of the velocity, observes, "upon the whole, we find that the resistance of the air, as determined by our experiments, differs very widely, both in respect to the quantity of it on all figures, and in respect to the proportions of it on oblique surfaces, from the same as determined by the preceding theory, which is the same as that of Sir Isaac Newton, and most modern philosophers." And further, he says, "we conclude therefore, that all the theories of the resistance of the air hitherto given are very erroneous. And I have only laid down the preceding one, till further experiments on this important subject shall enable us to deduce from them another, that shall be more consonant to the true phenomena of nature."

Whether I have noticed every thing that ought to be taken into consideration, in describing how the experiment aforesaid ought to be made, will, perhaps with some, be a matter of doubt: but this I may venture to aver, that, if I have not, further discoveries on the subject will tend to a greater reduction in the dimensions of the wall; and as this enquiry has contributed to that end, I shall remain satisfied with the correctness of the theory here established, till more data can be obtained.
TO C. E. CARRINGTON, ESQ.
SECRETARY TO THE ASIATICK SOCIETY.

SIR,

THE nature and effects of the poison of serpents having lately attracted the attention of Mr. William Boag, one of the surgeons at this presidency, I have the pleasure to submit to the consideration of the Society, the remarks drawn up by that gentleman, on a subject, hitherto involved in much obscurity; and which the theory now offered, may perhaps tend to throw new and useful lights upon.

HAVING, since my leaving Bengal, been visited at this place by Purana Poori, the Sunyaffy, of whose former travels some account was given in my letter to Mr. Secretary Morris, of the 23d of September 1795; and having, in consequence, found him to vary in a few respects, from the tenor of his former narrative, so as to affect its accuracy, in as far as regards the exact situation of Cailafa Kungri; I think it incumbent on me (the more especially from observing in the newspapers that his former account makes part of the Society's last publication) to apprise them, that he now declares, he clearly understands the hill or pinnacle in question to be situated only about two miles to the southward of Maunfeerweer lake; as well as that the Ganges flows visibly from what he now says he has heard to be its spring-head in that hill, to the distance of between seven and eight miles; and thence works itself a subterraneous passage, until it again emerges in the country of Kedar Nauth, at the place called Gungowry.

WITHOUT attempting satisfactorily to account for this difference in Braun Poory's first and latter accounts, it may be deemed of sufficient importance to call for this acknowledgment of it, in view to the celebrity of the geographical position to which it relates.

I have the honour to remain, &c. &c.

Bombay, the 4th April, 1798. JON. DUNCAN.
ON THE POISON OF SERPENTS,

By W. Boag, Esq.

SECTION I.

I propose, in this paper, to make some enquiry into the nature of the poison of the serpent, and to ascertain, as far as I am able, the most successful method of removing the disease it produces.

Whether the principles I shall endeavour to establish will be admitted as satisfactory, or sanctioned by future, and more extensive experience, I cannot pretend to determine; but the discussion cannot be altogether destitute of utility in this climate, where serpents are much more numerous, and much more dangerous than in Europe.

I shall begin by observing that, by far the greatest number of serpents are not venomous. In the 13th edition of the Systema Naturæ, published by Professor Gmelin, we find a list of two hundred and nineteen different kinds of snakes; and Linnaeus informs us, that about one in ten only are poisonous; we also know it to be true, that many snakes which possess a poisonous quality, are not mortal to man, though they may be destructive to smaller animals.

It would be a desirable thing to be able to ascertain, from the appearance of a snake, whether it be venomous or not, but these animals so nearly resemble one
one another, that it is impossible, without great experience, to distinguish them. The skin on the belly and tail of serpents, is composed of scales, which vary, in number and arrangement, in different serpents. Upon this circumstance, Linneus has founded his division of the serpent tribe into six distinct genera. But this division, however useful it may be to the naturalist, is of little use to the physician, who is desirous of distinguishing the harmless from the venomous serpent: the colour, which is most commonly attended to, is a very fallacious mark, for it commonly changes with age: a serpent with a large head, is generally suspected to be venomous; but the mark which is chiefly to be depended on, is the large canine teeth, or fangs, fixed in the upper jaw, which are commonly two in number, but sometimes more. These teeth are covered with a membranous sheath, and are crooked, moveable, and hollow, to give passage to the venom, which they receive from a small reservoir, that runs along the palate of the mouth, and passes through the body of each fang. This reservoir contains but a very small quantity of venom, which is forced out of it when the animal attempts to bite, by a strong muscle fixed to the upper jaw, and that covers it nearly through the whole of its length. This is the means of defence given to serpents; it has been well observed by Linneus, that if nature has thrown them naked on the ground, destitute of limbs, and exposed to every injury, she has in return, supplied them with a deadly poison, the most terrible of all weapons, and which has made them, from the earliest ages, to be regarded as objects of horror, or of religious veneration, by the human race.

SECTION II.

The symptoms which arise from the bite of a serpent, are commonly pain, swelling and redness in the part bitten; great faintness, with sickness at stomach, and sometimes vomiting, succeed; the breathing becomes short
short and laborious, the pulse low, quick, and interrupted: the wound, which was at first red, becomes livid, black and gangrenous; the skin of the wounded limb, and sometimes of the whole body, takes a yellow hue; cold sweats and convulsions come on, and the patient sinks, sometimes in a few hours, but commonly at the end of two, three, or four days.

This is the usual progress when the disease terminates fatally, but happily the patient will most commonly recover, a reflection which should moderate the fears of those who happen to be bitten by snakes, and which at any rate should, as much as possibly, be refuted, as the depressing passion of fear will, in all cases, allist the operation of the poison.

We read in authors that the bite of some snakes produces symptoms peculiar to themselves*. The asp is said to produce an universal torpor and lethargy without pain: for this reason we are told, Cleopatra, the celebrated queen of Egypt, preferred a death inflicted by the bite of this animal to any other. This is a fact concerning which historians may differ, but it appears certain, from some cases related by Captain Gowdie, in Dr. Russel's late splendid publication, and by other writers, that the bite of serpents will, in this manner, sometimes produce death. Lucan, in his pharsalia, mentions a variety of serpents that infested the Roman army in its march over the Lybian desert, and he distinguishes them by the various symptoms they produced. But the dreadful catalogue given by Lucan, should rather be considered as poetical embellishments, than historical facts; and whatever truth may be in this variety of symptoms, it is infinitely of more importance to know, that the nature

of the venom is the same in all of them, and consequently to be removed by the same means: this opinion appears to be just and natural, though it may not admit of any direct proof. It has uniformly been observed, that even the same serpent possesses very different degrees of power in its bite, according to the season of the year, and other circumstances: this is beautifully touched upon by Virgil, when speaking of a serpent that was, in his time, common in Italy.

Postquam exauista palus, terraque ardone dehiscent,
Exilīt incicum, et flammantia lumina torquens
Sævit agris, asperque fīti, atque exterritus ælu.
Ne mihi tum molles sub dio carpere somnos,
Neu dorso nemorīs libeat jacuiffe per herbas:
Cum potītis novus exuviis, nitidusque juventa
Volvitur, aut catulos tēlis, aut ova relinquens
Arduus ad solēm, et linguis micat ore trifulcis.

Virg. Georg. lib. 3d.

SECTION III.

We are now to enquire in what manner the venom produces such fatal effects upon the human body. This it will be admitted is a very interesting question, and has given rise to a great variety of opinions, but after all, no subject seems to be less understood. Ancient writers have offered a variety of crude conjectures, which have deservedly been forgotten; they, however, made one important observation, "that the poison produced its effects in consequence of a wound, and through the medium of the blood." Upon this view of the disease, the whole of their practice was founded; it was the object of all their applications, as expressed by Celsus, "quō plus vitiati jam sanguinis extrahatur." This opinion, however, did not continue to be maintained: later physicians, supported by
by the respectable authority of Dr. Mead, observing how quickly death sometimes follows the bites of serpents, concluded that the venom could act through the medium of the nerves only. This is one of those vague conjectures which has served, at one time or another, to obstruct the progress of every science, and which owes its reputation to a sort of readiness in explaining every thing, because it can explain nothing in an intelligible manner. The celebrated Italian naturalist, Fontana, has freed us from this difficulty, by demonstrating, from a great variety of experiments on different animals, that the venom of the viper is perfectly innocent when applied to the nerves only; that it produces in them no sensible change, and that they are incapable of conveying the poison to the animal. On the other hand, he has shewn in a very distinct manner, that it acts immediately upon the blood, that through the medium of this fluid, it destroys the irritability of the muscular fibres, and produces death. Neither is it difficult, upon this view of the subject, to understand how the poison may sometimes produce very sudden death; for if this active matter happen to be thrown immediately into a large vein running along the surface of the body, it will more readily be carried to the vital parts, and may render the use of the most powerful remedies ineffectual.

The ground being so far cleared, the question now occurs, what is the peculiar quality in the venom, which enables it to produce such direful effects? Till we can answer this question in a satisfactory manner, it is evident, that the practice in this disease must be guided by chance, and we can entertain no rational hope of correcting the poison. It is not many years since this subject seemed to be covered with an impenetrable veil, and Fontana, among all his reasonings upon the poison of the viper, does not once attempt to remove it. It is therefore an agreeable reflection, that the rapid progress which chemistry has made of late years,
years, enables us to enter upon this part of the subject with some degree of confidence, and if it should be thought I have failed in determining this question with sufficient precision, the view here taken of the subject may not be altogether defective of use. It is an opinion at least as old as Pliny *, that the blood is a living fluid, but it was reserved for the late celebrated physiologist, Mr. John Hunter, to place this opinion among the number of those truths that can no longer be disputed. How the life of this fluid begins, and in what the living principle itself consists, are matters concerning which we shall probably remain for ever ignorant; but it has been established beyond all controversy, that the life of the blood immediately depends upon the action of the atmospheric air, to which it is exposed in its passage through the lungs. The human heart, and in general the heart of all animals with warm blood, has two cavities or ventricles, and the blood, before it is returned to the right ventricle of the heart, has performed two circles, a lesser between the heart and the lungs, and a larger between the heart and the rest of the body. While the blood passes through the lungs, it undergoes a very remarkable change in its colour, and other properties: a certain portion of the atmospheric air is attracted and absorbed, while the remainder carries off by expiration, that matter in the blood, which is either useless or noxious to the body. The atmosphere we live in, it is now well known, is a compound fluid, one fourth part of which is called pure or oxygen air, and the remainder, and larger portion, noxious or azotic air; but it is the former part only, which is attracted by the blood as it passes through the lungs, and contributes to the support of animal life, from whence also, the red colour of the blood, and the heat of animals is derived. Independently of the direct proofs of these

* In treating on the blood, he observes—Magna et in eo vitalitatis portio. Emillus spiritum secum trahit, tamen tacitum non sentit.

facts afforded by chemical experiments, they admit of further illustration from serpents themselves. The heart of serpents, and all other cold blooded animals, has but one cavity, and the blood performs but one circuit round the body, so that a small portion only passes through the lungs: hence little of their blood is exposed to the action of the atmosphere, it is therefore but little loaded with oxygen, it is not of so high a colour, and the heat of their bodies is less.

These fundamental truths have already given a new appearance to the theory and practice of medicine, and they now lead me to conjecture that the poison of serpents acts upon the blood, by attracting the oxygen, which it receives from the atmosphere in its passage through the lungs, and upon which its vitality depends.

In support of this opinion, I would adduce the following arguments:

1. Man, and other warm blooded animals, exposed to an atmosphere deprived of oxygen, quickly expire. The poison of a serpent when introduced into the blood, also causes death, but carried into circulation by a wound, and in very small quantity, its operation is comparatively slow and gradual.

2. The appearances on dissection in both cases, are very similar. The blood becomes of a darker hue, and coagulates about the heart and larger vessels; the irritability of the fibres are nearly to the same degree destroyed, and the body has a strong tendency, in both instances, to putrefaction.

3. Doctor Mead mixed the venom of the viper, and healthy blood together out of the body, and he did not perceive that it produced any change in its appearance: this arose from his mixing a small quantity of the
the venom with a large quantity of the blood: but if two or three drops of venom be mixed with forty, or fifty drops of blood, it immediately loses its vermillion colour, becomes black, and incapable of coagulation.

4. It is a very remarkable circumstance, that the poison of the serpent has most power over those animals, whose blood is the warmest, and the action of whose heart is the most lively: while on the contrary, it is not a poison to the serpent itself, nor in general to cold blooded animals. The reason appears to be this: cold blooded animals do not require a large quantity of oxygen to preserve them in health; this is evident from the conformation of their heart, and respiratory organs, as already mentioned. It does not however follow, that no quantity of the venom would destroy them, for it is also evident from their possessing respiratory organs of any kind, that a certain quantity of oxygen is absolutely necessary, and hence we know that some of them, such as frogs, may be killed by the venom, though it always produces its effects more slowly upon them, than upon animals with warm blood.

Having thus endeavoured to ascertain the method in which the poison operates, it may now be asked, what substance can it be, that so strongly attracts the oxygen of the blood? The venom is inodorous and insipid, contrary to the opinion of Doctor Mead, it is neither sharp nor fiery, for it has scarcely any perceptible taste; it has the appearance, and sensible properties of an animal mucus, but this mucus is evidently a vehicle to some very active matter: on this subject it would not be difficult to conjecture, but as in the present state of our knowledge, no conjecture we could offer could be established upon any satisfactory grounds, we shall leave this part of the subject for future investigation.
SECTION IV.

We now proceed to enquire into the most successful method of curing the disease which the poison produces; and this part of the subject will, we hope, afford an additional proof, that the view here taken of the operation of the poison, is most probably a just one.

It would be an endless and unprofitable task to enumerate all the remedies which have been imposed upon the credulity of mankind, as specifics against the poison of serpents; they have been obtained from all the kingdoms of nature, and there is no country, however rude and barbarous, where the inhabitants have not boasted of some specific peculiar to themselves. The ancient physicians highly extolled various preparations of the viper itself as a remedy in this disease: it would have been a fortunate circumstance, if the same animal that produced the poison, should also have afforded an antidote to destroy it. Human saliva, as we are informed by Seneca, and the elder Pliny, was believed to be a powerful remedy for the bite of a viper. The Phylii and Marsi in ancient times, pretended to possess some charm in their persons destructive to the poison of serpents; and we are told by Mr. Bruce, that a set of men still exist in Egypt, who will suffer themselves to be bitten, and with impunity, by the most venomous serpents in that country, whose bite would be to others, certain and speedy death. A great variety of vegetables have been celebrated in different countries for the bite of the serpent, and none more highly than the root of the Ophirrhiza Mungos, Lin: concerning which Kämpfer relates very surprising effects. It is chiefly used for the bite of the Cobra de Capello, (Coluber Naja, Lin:) by the natives of this country, and it would appear that they place great confidence in it. * In America also, a variety of snake roots

* A particular description of this plant will be found in the second volume of the Amoenitatem Academicae. In the 4th volume of the Asiatick Researches, Sir William Jones describes a plant under the name of Chandraca, which, from the quality ascribed to it, by the Bengal peasants,
roots have been discovered, and other vegetable remedies, which seem in general to unite the two qualities of warmth and bitterness, and it is very probable that byrouslng the vital functions, they may be of some use in assisting nature, to resist the deadening operation of the poison.

The volatile alkali is the remedy most commonly employed by physicians, both in this country and in Europe; but the belief which formerly prevailed, that it possessed some specific power, which corrected the poison, seems to be now very generally relinquished*; and it is now acknowledged to have no other action than that ascribed to it by Mr. Williams, of stimulating the heart and vascular system to a more vigorous exertion.

The calces, or as they are more properly called, the oxys of some metals, as arsenic, mercury, and silver, have been made use of, the efficacy of which as remedies in this disease, merit a more attentive consideration.

Arsenic has long been employed by the natives of this country, since it forms the principal ingredient in what is called the Tanjore pill. The little experience collected by Europeans, does not enable us to form any very exact judgment respecting it. The remedy itself produces very violent effects; and if used with any freedom, might occasion death. It is therefore difficult to distinguish the effects of the remedy from the symptoms of curing animals bitten by snakes, he conjectures, may be the same. There seems to be much obscurity among authors in their accounts of this plant, which sufficiently justifies the conjecture of Sir William Jones. It is named by different writers, Rametul, Naghavalli, Ekaavarya, Caju-ular. I took some pains to enquire, among the natives, for this root. A specimen was brought me, by a snake doctor, which corresponded to the description, given of it by Kämpfer. He named it Naghavalli: he said when a person was bit by the Cobra de capello, the piece of it was rubbed upon the eyelids, lips, and tongue, that it produced sickness and vomiting, but had no effect upon those who were not bitten. I chewed some of it, it was bitter and aromatic.

* Asiatick Researches, Vol. II.
of the disease: it should probably be employed in desperate cases only, and where no other powerful remedy can be procured. For though it may be very well adapted to counteract the poison, yet I think it neither so safe, nor so efficacious, as other remedies which are now to be mentioned.

The preparations of mercury, so far as I can judge from the limited opportunities I have of collecting information from books, seem also to have been but little used in this disease, although mercury is a remedy, from which I think much benefit might be expected. I find in the Systema Naturæ the following observation on the Coluber Rhedi: Lin. "Mufu celerrime lethalis, nisi mercurii solutione gummosa, et gentianæ decocto succurritur ægro."—If mercury should ever come into use in this disease, it should certainly be employed in a more effectual manner than is commonly practiced; and if we are right in asserting that the nature of the poison is the same in all serpents, the observation of Linnæus respecting the Coluber Rhedi: will, with some limitation, apply to them all.

We are indebted to Fontana for any knowledge we possess on the use of the lunar caustic, which is a preparation of silver in the nitric acid; and considering the length of time that has elapsed since his publication, and the advantages resulting from its use, it is wonderful it has not excited more general attention.

I shall confine the result of Fontana's experiments on this substance in a few words. He first mixed the venom with the lunar caustic, applied this mixture to a wound, and found that the venom was rendered entirely innocent, while the corroding power of the caustic was diminished. He next wounded a variety of animals, with venomous teeth, scarified the wounds, and washed them with a solution of lunar caustic in water: by this means, the life of the greatest
number of the animals was faved, though they were such as he knew to be most easily killed by the poison, and the death of others was retarded. He also tried a weak solution of the same remedy internally with remarkable success, and upon the whole he congratulates himself in seeing his labours at length rewarded by the discovery of a true specific remedy for the bite of the serpent.

Fontana was led to the use of this remedy by no previous theory, for neither before, nor after his discovery, does he attempt to account for its effects, and the infinite variety of his experiments, as well as the fidelity and accuracy with which he relates them, entitle him to our confidence and praise.

I am now to explain in what manner, the successful use of these substances supports the principles we have been endeavouring to establish: and here again I am under the necessity of assuming some facts, which are established and indisputable.

1. Oxygen enters into the composition of all acids, and is the principle, as its name imports, upon which their acidity depends.

2. Metals are united with oxygen under various circumstances, but chiefly in two ways: the first is by burning them in an open fire, or to speak more correctly, by the contact of heat and air, when they are converted into metallic oxyds: the second, by the decomposition of acids, when they form compound salts.

3. Oxygen is attracted by different metals with different degrees of force, those which attract it with the least force, are the perfect metals, as platina, gold, silver, hence they cannot be converted into an oxyd by exposure to heat and air, except at very high temperature,
OF SERPENTS.

nature. After them comes mercury, and after it, the imperfect and semi-metals: these last, of which arsenic is one, for the most part attract oxygen strongly, and are generally found united with it under various forms in the bowels of the earth.*

Oxygen, we have already observed, is a principle which enters into the composition of the blood, and performs a very important part in the animal economy. It must also be evident that the blood may be more or less loaded with this principle, and that disease may be produced, either by too great, or by too small a quantity being present in the circulating mass. We have already said that the disease produced by the bite of a serpent, arises from the subtraction of oxygen from the blood; the indication of cure must therefore be, to supply this oxygen, which we suppose to be withdrawn. The most obvious method of accomplishing this will be to employ such substances as are known to contain oxygen in the greatest abundance, and to part with it with the greatest facility. This is precisely the character of the lunar caustic, which is made by dissolving silver in the nitric acid, and afterwards evaporating and crystallising the solution. The composition of the nitric acid is also accurately ascertained, it differs from the common nitrous acid of the shops, by containing a greater quantity of oxygen, and in a singularly loose form; so that if our reasoning upon the poison of the serpent be in any degree correct, no medicine would appear to be better calculated than this, to obviate its effects.

The application of the foregoing principles, will explain the probable efficacy of the different metallic preparations we have just spoken of, which will be

* I am very sensible that the terms perfect, imperfect, and semi-metals, are improper: for all metals are equally perfect of their kind, but I have complied with the common terms, that I might the more readily be understood.
connected with the order of their attraction for oxygen, and the quantity they contain; it will also lead us further to improve and perfect the practice: for whenever a person is bitten by a serpent, and danger is apprehended, every means should be employed, which human ingenuity has discovered, of speedily oxygenating the system.

Whether the same method might not be applicable to the diseases arising from some other animal poisons, is a subject which remains for experience to determine. There is great reason to believe, that the venereal poison is removed by this method*, and it is not improbable, that the same practice might be successful in the Rabies Canina. This disease, however, very seldom makes its appearance in this part of India, although it is mentioned, by the natives, as not a very uncommon disease at Peonah. I lately attended in this place, with Mr. Scott, a man who had been bit by a dog, and who was supposed to have some symptoms of this disease: we suspected at first, and were soon convinced, that the whole was imaginary, for the man, without any assistance, quickly recovered: and this is the only instance I have had an opportunity of seeing in India.

I shall conclude this paper, by giving a connected view, of what appears to be the most adviseable method, of treating the bite of a serpent, which is apprehended to be venomous. This obviously divides itself into the external treatment of the wound, and the internal use of medicines, to counteract the action of the poison in the blood.

The Pserilli, as already mentioned, possessed a high reputation for curing the bites of serpents, but their whole method, when stripped of mystery and fable,

* I refer here to a paper published by Mr. Scott, on the nitric acid.
confisted in fucking the wound. This practice is recommended in strong terms by Celsus, who observes, that it is not only harmless to the person who fucks the wound, but will save the life of the person wounded: “ergo quisquis id vulner exfuxerit, et ipse tutus erit, et tutum hominem praestabit.” Though I would not be so sanguine in the success of this practice, yet as giving one chance to escape, it ought not to be omitted. A ligature should, as soon as possible, be tied above the part bitten, so as to impede, but not entirely to stop the circulation of the blood, for the bite of a serpent is for the most part superficial, and the poison is carried into circulation by the smaller vessels on the surface. The wound should next be scarified, and washed with a solution of the lunar caustic in water: I would prefer, for this purpose, a weak solution, because it may be used more freely, and frequently repeated. The same medicine should also be given internally, and repeated, at intervals, as circumstances might point out. The foregoing reasoning upon this medicine, induced me, some months ago, to make trial of it internally, in a different disease; this, therefore, is not the place to state the result of these trials; but it is proper to mention that I know, from repeated experience, it may be taken, two or three times in the day, in the quantity of half a grain dissolved in two ounces of pure water*, and its use persisted in, for several days, with great safety. The principal effects it produces, are a heat in the stomach and breast, and, after a time, a tenderness in the gums, and a disposition to bleed, but without that swelling and pain attending the use of the oxyds of mercury.

To these means might be added (especially if the symptoms, that may have come on, are not materially relieved) a warm bath acidulated with the nitric acid.

* The water should be distilled, or at least it should be rain water, otherwise the lunar caustic will be in part decomposed, which will be evident, by a white cloud forming in the solution.
In this bath, which should be made sufficiently strong to produce a very sensible irritation on the skin, the wounded limb, and a great part of the body, might be placed for half an hour, and repeated as circumstances might direct. We are informed by Fontana, that he found a bath of very warm water exceedingly useful; he says that it lessened the pain, abated the inflammation, and the part bitten did not become so livid and changed. I apprehend that the moderate addition of the nitric acid to this bath, would be a great improvement: it has been made use of successfully in this place, by Mr. Scott, in some cases of Lues Venerea, and I have used it in some bad sores, in this country, with great effect.

There are a variety of other methods of oxygenating the blood, but all of them may not be so well adapted to remove the disease, nor of such easy application and attainment. I should hope, if the foregoing plan be diligently pursued, it would, in almost every instance, be sufficient to effect a cure. The blood may be oxygenated through the medium of the lungs, either by exposing the patient to an atmosphere loaded with nitric vapours, in the manner recommended by Dr. Charmichael Smyth in contagious diseases*, or a more highly oxygenated atmosphere might be breathed by means of a pneumatic apparatus, adapted for the purpose, as recommended by Dr. Beddoes.

But as this paper has already extended to a greater length than I at first intended, I content myself with barely mentioning these methods, and must refer to the authors themselves for a particular account of the practice here alluded to.

* It may be proper to remark, that at the time Dr. C. Smyth made the experiments above alluded to, he was not sufficiently acquainted with the materials he was using, to draw the proper conclusions from them; this, however, cannot affect the utility of the practice he recommends.
I hope I have said enough, to shew that the principles I have attempted to establish are at least supported by probability, that the method here proposed has already been sanctioned by a more certain experience than any other, and that it affords the most likely means of counteracting the deadly poison of the serpent tribe.

It is, however, to experience alone, we must trust, for the ultimate decision upon this subject; and, to whatever conclusion this may lead us, I shall most willingly follow; professing myself much more anxious for the discovery of truth, than for the support of any of the opinions stated in this paper. I shall think myself sufficiently happy, if this essay should in any way tend to elucidate a subject, as important as it is obscure.

SUPPLEMENT
HAVING at length succeeded in procuring a snake with the venomous teeth and poison bag entire, but which are commonly extracted in those serpents which the natives carry about with them, I resolved to make some experiments with it. The snake I had procured was a large *Cobra de Capello* (*Coluber Naja*, Lin.) and which is generally represented to be the most venomous of all serpents.

**EXPERIMENT I.**

I was, in the first place, desirous of ascertaining the power of the venom: for this purpose, the snake was made to bite a young dog in the hind leg, and for which no medicine, either internal or external, was made use of. The dog, upon being hit, howled violently for a few minutes; the wounded limb soon became paralytic; in ten minutes the dog lay senseless and convulsed; in thirteen minutes he was dead.

**EXPERIMENT II.**

A dog, of a smaller size, and younger, was now bitten in the hind leg, when he was instantly plunged into a warm nitric bath, previously prepared for the purpose: as soon as possible after he was in the bath, the wound was slightly scarified, and a weak solution of lunar caustic in water was poured down his throat: but the symptoms made the same progress as in the first experiment, and the dog died in the same time.

Upon opening these two dogs, about half an hour after death, the blood in the heart, and in the larger vessels,
vessels, was of a dark colour, in a fluid state, and did not coagulate on exposure to the atmosphere.

**EXPERIMENT III.**

After the interval of one day, the same snake was again brought, and made to bite a young puppy in the hind leg, but above the part to be bitten, I had previously tied a ligature: immediately after he was bitten, the wound was scarified and washed with a solution of lunar caustic. The dog did not appear to feel any other injury than what might arise from the ligature round his leg: half an hour after he was bitten, the ligature and dressing, which consisted of lint dipped in the solution of lunar caustic, were removed. The dog soon began to sink, gradually lost the use of his limbs, breathed quick, was convulsed, and died in half an hour more. On opening this dog, the blood coagulated readily on being emptied from the vessels.

**EXPERIMENT IV.**

Another dog was now bitten in the hind leg, and immediately after a ligature was applied, as in the preceding experiment: the wound was scarified and washed as before, and for two hours the dog continued lively and well, when the ligature was removed.

**EXPERIMENT V.**

Another puppy having been bit in the same place, the wound was simply scarified, and washed with a solution of the lunar caustic, and for two hours the animal continued free from disease. In these two last experiments the dogs were very young, and fed by their mother's milk: at the expiration of the time mentioned, they were carried to her, but she avoided them, and they both died in the course of the day.
EXPERIMENT VI.

Observing in the last experiments, that the venom was probably weakened by use, I waited for two days, and resolved to try its effects a second time where no medicine was made use of. A dog was accordingly bitten by the same snake in the hind leg in the usual manner, and in twenty minutes he was dead. It is however worthy of notice, that though the mortal progress of the poison was as certain as before, it did not now appear to produce any pain, the animal did not howl upon being bit, but gradually funk and died. The blood of this dog continued also in a fluid state, and was of a dark colour.

EXPERIMENT VII.

A second dog being now bit, the wound was scarified and washed with a solution of lunar caustic, and the same medicine given in small quantities internally, and repeated at intervals. The dog appeared to be but little affected for about half an hour, when he vomited violently for several times, gradually funk, and died at the expiration of an hour. The blood in this dog coagulated after death.

EXPERIMENT VIII.

A third dog being bit in the same manner, the wound was washed with a volatile alkaline spirit, and the same medicine given internally diluted with water, and repeated at intervals. This dog was in a short time convulsed; vomited several times, and then seemed to revive: but he soon relapsed, and in three hours he was dead. This dog was not opened.

EXPERIMENT IX.

After the interval of two days the same snake was brought,
brought, and as the volatile alkali appeared to have been of some use in the last experiment, it was determined to try it first: and this experiment, as well as several of those already related, was conducted by my friend Dr. Moir with attention and accuracy. A dog was accordingly bitten in the usual place, and the volatile alkali given as in the preceding experiment: the dog was dead in eighteen minutes.

**EXPERIMENT X.**

To a dog bitten in the same place, immediately after the former, that we might have the means of ascertaining the effects of the remedy, nothing was given, he died in eighteen minutes.

**EXPERIMENT XI.**

Observing in the seventh volume of the medical facts published by Dr. Simmons, that Cayenne pepper was a powerful remedy for a vegetable poison obtained from the roots of the Jatropha Manihot, or bitter Cassada, I determined to make trial of it. To a dog bitten in the usual manner, five grain pills of the pepper were given, and the wounded limb was washed with an infusion of it in warm water. These pills had been repeated four times in the space of an hour, when the dog died.

**EXPERIMENT XII.**

A young puppy was now bitten in the ear, and exactly half a minute after the ear was cut off. The wound made by the knife bled freely. The dog continued lively for some time, but in half an hour, he began to droop, and in half an hour more, died. It is observed by Fontana, and he sufficiently well accounts for it, that on biting the ears of animals, a drop of venom collects on the ear, at the hole made by the tooth: this was very remarkable in the experiment now related: a quantity of venom, like a large drop of yellow fecum, collected on the ear, and trickled to the ground.
It may be proper in general to observe, that in all these experiments, the part bitten did not swell nor inflame, a livid mark could be distinguished where the tooth entered, but could be traced only for a very little way. When the wounds were scarified, they bled little or none at all; but before death they commonly bled freely, and the scarifications were exceedingly discoloured.

In all the dogs which were opened, the blood was found to be in a fluid state. Upon examining, after death, those animals which died by the poison of the viper, the Abbé Fontana commonly observes, that he found the blood coagulated about the heart and larger vessels. My experience has not confirmed this observation, which I attribute to the great difference in point of strength possessed by the venom of the snake made use of in the preceding experiments. In those cases where the poison acted rapidly, the blood when emptied from the vessels, shewed no disposition to coagulate, and seemed to be of a darker colour than natural: but in those cases where the animals died more slowly, the blood readily coagulated on exposure to the atmosphere. It is not foreign to the present subject to observe, that while the poison of serpents in mingling with the blood, has a strong tendency to prevent its coagulation, it on the contrary more readily coagulates in those animals, who have breathed pure oxygen air.*

These experiments will perhaps serve little other purpose than to prove the quick and destructive operation of the poison of this kind of serpents, and of the inefficacy of the most celebrated remedies which have been hitherto discovered. It is certain however that upon larger animals the progress would have been neither so rapid nor destructive, and upon the human body it is also probable that remedies might

* Beddoes on factitious airs.
have been employed with greater success: for the
delicacy of the human skin is very great, and the
absorption of any remedy that might be applied to it,
extensive and speedy. Dogs, we are told, do not
perspire, and it is probable that there exists much
correspondence between the powers of absorption and
perpiration.

The little success attending the use of the lunar
cautic in these experiments, affords a sufficiently con-
vincing proof, that the snakes made use of by the
Abbe' Fontana, and the one made use of by me,
possess very different degrees of strength in their ve-
nom: there are one or two experiments where this re-
medy appeared to be used with some effect: but I
imputed it to the weakened power of the venom by
use: and I am fully convinced that the poison of this
kind of serpent, when it is in full vigour, is so cer-
tainly and rapidly destructive, at least to small ani-
imals, that neither the lunar caustic, nor probably any
other remedy, would arrest its progress. It appears
that even the delay of half a minute in cutting off
the ear that was bitten, was fatal to the animal; and
it is scarcely possible that to a person bitten by a
snake, any kind of remedy could be applied in a
shorter time. No experiment could be better calcu-
lated than this last, to shew the power of the venom
of this kind of serpent, for Fontana observes, that
it is very difficult to kill either dogs or rabbits when
bitten in the ears, and out of all the experiments he
makes upon the ears of these animals, and where no
attempt was made to relieve them, none of them died.

I am therefore still of opinion, that the method of
cure mentioned in the foregoing paper is the most ra-
tional, and the most likely to succeed in preventing
death, as well as the other bad consequences which
sometimes follow the bite of a serpent that is not
mortal. In the use of the nitric acid bath, I should
have much confidence: and this confidence arises
from
from a greater experience of its powerful influence upon the human body in different diseases: this experience will soon be communicated to the public by my friend Mr. Scott, whose labours in the application of a most powerful and useful agent in medicine, and especially useful as applied to the inhabitants of warm climates, merit the greatest praise.
VI.

An Account of the Petroleum Wells in the Burmha Dominions, extracted from the Journal of a Voyage from Ranghong up the River Erai-Wuddey to Amarapoorah, the present Capital of the Burmha Empire.—By Captain Hiram Cox, Resident at Ranghong.

SATURDAY, JANUARY 7, 1797.

Wind easterly, sharp and cold, thick fog on the river until after sun rise, when it evaporated as usual, but soon after collected again, and continued so dense till half past eight A. M. that we could barely see the length of the boat.

Thermometer at sun rise 52°, at noon 74°, in the evening 69°; general course of the river north 20° west, main breadth from one to one and a half miles, current about two and a half miles per hour.

East bank, high, rugged, barren downs, with precipitous cliffs towards the river; of free stone intermixed with strata of quartz, martial ore and red ochre; beech moderately shelving, covered with fragments of quartz, silex, petrifactions and red ochre, and with rocky points projecting from it into the river.

Western bank, a range of low sandy islands, covered with a luxuriant growth of reeds. These at present narrow the stream to three quarters, and in some places to half a mile, but are overflowed in the rains; the main bank rather low and sandy, subject to be overflowed, its whole breadth about three miles to the foot of a range of low woody hills, which in
point of vegetation, form an agreeable contrast to the eastern shore; these hills are bounded to the westward at the distance of about twenty miles from the river, by an extensive range of high mountains, cloathed with wood to their summits.

At half past ten A. M. came to the lower town of Rainanghong, a temple in it of the antique Hindoo style of building.

At noon came to the center town of Rainanghong (literally the town through which flows a river of earth oil), situated on the east bank of the river, in latitude 20° 26' north, and longitude 94° 45' 54" east of Greenwich. Halted to examine the wells of Petroleum.

The town has but a mean appearance, and several of its temples, of which there are great numbers, falling to ruins: the inhabitants however are well dressed, many of them with gold spiral ear ornaments, and are undoubtedly rich, from the great profit they derive from their oil wells, as will be seen below.

At two P. M. I set off from my boat, accompanied by the mewthaghee or zemindar of the district, and several of the merchant proprietors, to view the wells. Our road led to the E. N. E. through dry beds of loose sand in the water courses, and over rugged arid downs and hillocks of the same foil as described above; the growth on them, consisting of scattered plants of Euphorbium, the Cassia tree, which yields the Terra Japonica, commonly called cutch or cut, and used throughout India as a component part of a beera of paun, also a very durable timber for lining the oil wells, and lastly the hardy biar or wild plumb common in Hindostan.

The sky was cloudless, so that the sun shone on us with undiminished force, and being also unwell, I walked
walked slowly, and as we were an hour walking to
the wells, I therefore conclude they are about three
miles distant from the river; those we saw are scattered
irregularly about the downs at no great distance
from each other, some perhaps not more than thirty or
forty yards. At this particular place, we were informed there are one hundred and eighty wells, four or
five miles to the N. E. three hundred and forty more.

In making a well, the hill is cut down so as to form
a square table of fourteen or twenty feet for the crown
of the well, and from this table a road is formed, by
scraping away an inclined plain for the drawers to de-
scend, in raising the excavated earth from the well, and
subsequently the oil. The shaft is sunk of a square
form, and lined as the miner proceeds, with squares of
Caffia wood staves; these staves are about six feet
long, six inches broad, and two thick; are rudely
jointed and pinned at right angles to each other,
forming a square frame, about four and a half feet in
the clear for the uppermost ones, but more contracted
below. When the miner has pierced six or more feet
of the shaft, a series of these square frames are piled
on each other, and regularly added to at top; the
whole gradually sinking, as he deepens the shaft, and
securing him against the falling in of the sides.

The soil, or strata to be pierced, is nearly such as
I have described the cliffs to be on the margin of the
river, that is, first, a light sandy loam intermixed with
fragments of quartz, filex, &c.; second, a friable sand
stone, easily wrought, with thin horizontal strata of a
concrete of martial ore, talc and indurated argill (the
talc has this singularity, it is denticulated, its lamina
being perpendicular to the horizontal lamina of the
argill on which it is seated) at from ten or fifteen feet
from the surface, and from each other, as there are
several of these veins in the great body of free stone.
Thirdly, at seventy cubits, more or less, from the
surface, and immediately below the free stone, a pale

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blue
blue argillaceous earth (shiftous) impregnated with the petroleum and smelling strongly of it. This they say is very difficult to work, and grows harder as they get deeper, ending in shift or slate, such as found covering veins of coal in Europe, &c. Below this shift at the depth of about 130 cubits is coal. I procured some, intermixed with sulphur and pyrites, which had been taken from a well, deepened a few days before my arrival, but deemed amongst them a rarity, the oil in general flowing at a smaller depth. They were piercing a new well when I was there, had got to the depth of eighty cubits, and expected oil at ten or twenty cubits more.

The machinery used in drawing up the rubbish, and afterwards the oil from the well, is an axle crossing the center of the well, resting on two rude forked staunchions, with a revolving barrel on its center, like the nave of a wheel, in which is a score for receiving the draw rope; the bucket is of wicker work, covered with dammer, and the labour of the drawers, in general three men, is facilitated by the descent of the inclined plain, as water is drawn from deep wells in the interior of Hindostan.

To receive the oil, one man is stationed at the brink of the well, who empties the bucket into a channel made on the surface of the earth leading to a funk jar, from whence it is laded into smaller ones, and immediately carried down to the river, either by coolies or on hackeries.

When a well grows dry, they deepen it. They say none are abandoned for barrenness. Even the death of a miner, from mephitic air, does not deter others from persisting in deepening them when dry. Two days before my arrival, a man was suffocated in one of the wells, yet they afterwards renewed their attempts, without further accident. I recommended their trying the air with a candle, &c, but seemingly with little effect.
The oil is drawn pure from the wells, in the liquid state as used, without variation, but in the cold season it congeals in the open air, and always loses something of its fluidity; the temperature of the wells preserving it in a liquid state fit to be drawn. A man who was lowered into a well of 110 cubits, in my presence, and immediately drawn up, perspired copiously at every pore: unfortunately I had no other means of trying the temperature. The oil is of a dingy green and odorous; it is used for lamps, and boiled with a little dammer (a resin of the country), for paying the timbers of houses, and the bottoms of boats, &c. which it preserves from decay and vermin; its medicinal properties known to the natives is as a lotion in cutaneous eruptions, and as an embrocation in bruises and rheumatic affections.

The miners positively assured me no water ever percolates through the earth into the wells, as has been supposed, the rains in this part of the country are seldom heavy, and during the season a roof of thatch is thrown over the wells, the water that falls soon runs off to the river, and what penetrates into the earth is effectually prevented from descending to any great depth by the increasing hardness of the oleaginous argill and shift; this will readily be admitted when it is known that the coal mines at Whitby are worked below the harbour, and the roof of the galleries not more than fifty feet from the bed of the sea, the deficiency of rain in this tract may be owing to the high range of mountains to the westward, which range parallel to the river, and arrest the clouds in their passage, as is the case on the eastern side of the peninsula of India.

Solicitous to obtain accurate information on a subject so interesting as this natural source of wealth; I had all the principal proprietors assembled on board my boat, and collected from them the following particulars, the foregoing I learned at the wells from the miners and others.
I endeavoured to guard against exaggeration, as well as to obviate the caution and reserve which mercantile men in all countries think it necessary to observe, when minutely questioned on subjects affecting their interests, and I have reason to hope my information is not very distant from the truth.

The property of these wells is in the owners of the soil, natives of the country, and descends to the heirs general as a kind of entailed hereditament, with which it is said government never interferes, and which no distress will induce them to alienate. One family perhaps will possess four or five wells, I heard of none who had more, the generality have less; they are sunk by, and wrought for the proprietors; the cost of sinking a new well is 2000 tecals flowered silver of the country, or 2500 sicca rupees; and the annual average net profit 1000 tecals, or 1250 sicca rupees.

The contract price with the miners for sinking a well is as follows: for the first forty cubits they have forty tecals, for the next forty cubits three hundred tecals, and beyond these eighty cubits to the oil they have from thirty to fifty tecals per cubit, according to the depth (the Burmha cubit is nineteen inches English); taking the mean rate of forty tecals per cubit, and one hundred cubits as the general depth at which they come to oil, the remaining twenty cubits will cost 800 tecals, or the whole of the miner's wages for sinking the shaft 1140 tecals; a well of a 100 cubits will require 950 cassia staves, which at five tecals per hundred will cost 47½ tecals. Portage and workmanship, in fitting them, may amount to 100 tecals more; the levelling the hill for the crown of the well, and making the draw road, &c. according to the common rate of labour in the country, will cost about 200 tecals; ropes, &c. and provisions for the workmen, which are supplied by the proprietor when making a new well; expences of propitiatory sacrifices, and perhaps a sgniorage fine to government for permission to sink a new well, consume the remaining 512½ tecals; in deepening
ing an old well they make the best bargain in their power with the miners, who rate their demand per cubit according to its depth and danger from the heats or mephitic air.

The amount, produce, and wages of the labourers who draw the oil, as stated to me, I suspect was exaggerated or erroneous from misinterpretation on both sides.

The average produce of each well, per diem, they said was 500 vifs, or 1825 lbs. avoirdupois, and that the labourers earned upwards of eight tecals each per month; but I apprehend this was not meant as the average produce, or wages for every day or month throughout the year, as must appear from a further examination of the subject, where facts are dubious we must endeavour to obtain truth from internal evidence. Each well is worked by four men, and their wages is regulated by the average produce of six days labour, of which they have one sixth, or its value at the rate of one and a quarter tecals per hundred vifs, the price of the oil at the wells; the proprietor has an option of paying their sixth in oil, but I understand he pays the value in money, and if so, I think this is as fair a mode of regulating the wages of labour as any where practised; for in proportion as the labourer works he benefits, and gains only as he benefits his employer. He can only do injury by over-working himself, which is not likely to happen to an Indian; no provisions are allowed the oil drawers, but the proprietor supplies the ropes, &c. and lastly the king's duty is a tenth of the produce.

Now supposing a well to yield 500 vifs per diem throughout the year, deducting one sixth for the labourers, and one tenth for the king, there will remain for the proprietor, rejecting fractions, 136,876 vifs, which at 1½ tecals, the value at the wells, is equal to 1710 tecals per annum. From this sum there is to be 13 deducted
AN ACCOUNT OF THE PETROLEUM WELLS

deducted only a trifle for draw ropes, &c. for I could not learn that there was any further duties or expence to be charged on the produce; but the merchants say they gain only a neat 1000 tecals per annum for each well, and as we advance we shall have reason to think they have given the maximum rather than the minimum of their profits, hence therefore we may infer that the gross amount produce per annum is not 182,500 vifs.

Further, the four labourers share or one sixteenth deducting the king's tythe, will be 2250 vifs per month of thirty days, or in money at the above price twenty-eight tecals fifty avas, or seven tecals twelve avas each man per month, but the wages of a common labourer in this part of the country, as the same persons informed me, is only five tecals per month when hired from day to day; they also admitted that the labour of the oil drawers was not harder than that of common labourers, and the employment no ways obnoxious to health. To me the smell of the oil was fragrant and grateful, and on being more indirectly questioned (for on this part of the subject perhaps owing to the minuteness of my enquiries I observed most reserve), they allowed that their gain was not much greater than the common labourers of the country, nor is it reasonable to expect it should, for as there is no mystery in drawing of oil, no particular hardships endured, or risk of health, no compulsion or prevention pretended, and as it is the interest of the proprietors to get their work done at the cheapest rate, of course the numbers that would flock to so regular and profitable an employment, would soon lower the rate of hire nearly at least to the common wages of the country; besides I observed no appearance of affluence amongst the labourers, they were meanly lodged and clad, and fed coarsely, not on rice, which in the upper provinces is an article of luxury, but on dry grains and indigenous roots of the nature of Caffada, collected in the wastes by their women and children; further it is not reasonable to suppose that these labourers worked constantly, nature always requires
IN THE BURMHA DOMINIONS.

requires a respite, and will be obeyed, however much the desire of gain may stimulate, and this cause must more particularly operate in warm climates to produce what we often improperly call indolence. Even the rigid Cato emphatically says, that the man who has not time to be idle is a slave. A due consideration of this physical and moral necessity ought perhaps to vindicate religious legislators from the reproaches too liberally bestowed on them for sanctioning relaxation; be that as it may, I think it is sufficiently apparent that the article of wages is also exaggerated, and that 500 vifs must only be considered as the amount produce of working days, and not an average for every day in the year. The labour of the miners, as I have observed above, is altogether distinct from the oil drawers, and their pay proportioned to the hardships and risks they endure.

Assuming therefore as data, the acknowledged profit of 1000 tecals per annum for each well, which we can hardly suppose exaggerated, as it would expose the proprietors to an additional tax, and the common wages of precarious employment in the country, that is one month with another, including holy days the year round, four and a quarter tecals per month as the pay of the oil drawers, which includes the two extremes of the question, it will make the average produce of each well per diem, 300 vifs or 109,500 vifs per annum, equal to 399,675 lbs. avoirdupois, or tons 178,955 lbs. or in liquid measure 793 hogsheads of sixty-three gallons each; and as there are 520 wells registered by government, the gross amount produce of the whole per annum will be 56,940,000 vifs or 92,781 tons 1560 lbs. or 412,360 hogsheads, worth at the wells, at one and a quarter tecals per hundred vifs, 711,750 tecals or 889,737 ficca rupees.

From the wells, the oil is carried, in small jars, by cooleys, or on carts, to the river; where it is delivered to the merchant exporter at two tecals per hundred vifs.
vis, the value being enhanced three-eighths by the ex-
pense and risk of portage, therefore the gross value or
profit to the country of the whole, deducting five per
cent for waftage, may be stated at 1,081,860 ticals,
or 1,362,325 sicca rupees per annum, yielding a direct
revenue to the king of 136,232 sicca rupees per
annum, and perhaps thrice as much more before it
reaches the consumer; besides the benefit the whole
country must derive from the productive industry called
into action by the constant employment of so large a
capital on so gruff an article. There were between
seventy and eighty boats, average burthen sixty tons
each, loading oil at the several wharfs, and others
constantly coming and going while I was there. A
number of boats and men also find constant em-
VII.

ON THE MAXIMUM OF MECHANIC POWERS, AND THE EFFECTS OF MACHINES WHEN IN MOTION.

BY LIEUTENANT WILLIAM LAMBTON,

Of His Majesty's 33d Regiment of Foot.

MOST mathematicians, in treating on the science of mechanics, have drawn their conclusions from considering the weight and power in a state of equilibrium, and have deduced their proportions from their respective distances of each from the center of motion; or from what the velocities would be, supposing them to be put in a moving state. But in the actual application of any machine, whether simple or compound, we shall find that when it is put in motion by the superior force of the power, there will be a certain ratio between the weight and power, so that in any given time the effect may be the greatest possible. The various and most useful cases which relate to this subject are comprised in the following problems, and as it is my intention to determine the precise effects of such powers as are of the most general use in the construction of machines, such as the lever, the wheel, and axle, &c. and where the power applied to raise the weight, acts by the force of gravity; it will be necessary to take into consideration the effects of their own masses, and therefore some general propositions must be premised relative to the centers of percussion and gyration of the respective moving powers; and to compare the mass collected into the center of percussion or gyration of a beam or solid wheel, to that power, which acting at the extremity would give the same angular velocity.
It has already been demonstrated by mathematicians that if \( s \) be the center of suspension, or rotation; \( o \) the center of percussion, and \( g \) the center of gyration;—and if \( p \) be a particle and \( d \) its distance from \( s \), then \( so = \frac{\text{all the } pd^2}{\text{force of the body}}, \) and \( \sqrt{sg} = \frac{\sqrt{\text{all the } pd^2}}{\text{the body}} \)

which expressions are universal, let the form of the body be what it will. Now as the lever and wheel are powers whose operations are mostly influenced by their own weight, I shall consider every case in which they can possibly be effected. And notwithstanding that the part of mechanics relating to percussion and gyration, has been so copiously treated on by others, yet as it becomes so essential a part in the present theory, I shall include such propositions as immediately apply, and put them in the most convenient forms. Some of them, I believe are new, and particularly suited to the present subject.

**Prob. 1.** Let \( AB \) be a bar or beam perfectly straight and of uniform thickness, having its point of suspension \( S \), at any variable distance from the extremity \( A \); it is required to determine the distance of the center of percussion from \( S \).

Put \( AB = v \), \( AS = x \), and therefore \( SB = v - x \); and let the said distance of the center of percussion from \( s \) be \( y \), then \( v \) being an indefinitely small plane at right angles to the axis of the beam, \( v - x \frac{d}{dx} v \) will express one \( pd^2 \) or the fluxion of all the \( pd^2 \) in \( AB \); and by the same reasoning, \( v - x \frac{d}{dx} v \) is the fluxion of the force of \( AB \).

Hence \( y = \frac{\text{flu. } v - x \frac{d}{dx} v}{\text{flu. } v - x \frac{d}{dx} v} = \frac{2v^2 - 6vx \times 6x^2}{3v - 6x} \); where \( x \) and \( v \) may be taken in any ratio to each other. If \( x = 0 \) or the center of suspension be at \( A \), then \( y = \frac{v}{2} \) as has been proved by others. If \( x = \frac{1}{2} v \), then \( y = \frac{1}{2} v \) also, in which case the center of percussion will be at the other extremity \( B \), and when \( x = \frac{1}{4} v \), then \( y = 0 \), and the center of percussion coinciding with the center of gravity,
The effects of machines when in motion.

Gravity, the power of oscillation will cease, and the motion, if there be any, will be rotatory.

Cor. 1. If it be required to determine the distance of the center of suspension when the vibrations are the quickest possible, then \( y \), or its equal \( \frac{2\nu^3-6\nu x+6x^2}{3\nu-6x} \) becomes a maximum, and therefore its fluxion, by making \( x \) variable, is \( \pm 0 \). Hence \( 12\nu x^2-6\nu x \times 3\nu-6x \\
-\nu^3 \times 2\nu^2-6\nu x+6x^2 = 0 \), and \( x = \pm \frac{\nu}{6} \pm \frac{\nu}{3} \) or \( \pm \frac{x}{2} \pm \frac{\nu}{\frac{1}{2}} \), when \( S \) is taken towards \( A \), or on that side of the center of gravity.

Cor. 2. Other forms may be obtained if \( AS = x \) and \( SB = z \), both variable quantities:—for then \( \dot{x} + \dot{z} \) will express the fluxion of both ends, and \( x^2\dot{x} + z^2\dot{z} \) the fluxion of all the \( pd^2 \) in \( AB \). And since the force of any oscillating body may be expressed by multiplying the distance of the center of gravity from the center of suspension, into the body itself, the force of \( AB \) is therefore defined by \( \frac{x^2-x^2}{z} \). Hence \( y = \frac{\text{flux} \cdot z + \text{flux} \cdot x \cdot x}{x^2-x^2} = \frac{x^2-x^2}{z} \cdot \frac{z}{x^2} \cdot \frac{z}{x^2} \).

Then when \( x = 0 \), \( y \) becomes equal \( \frac{2}{3}x \); and if \( x = \frac{1}{2}z \), \( y = z \);—and when \( x \) and \( z \) are equal, \( y \) vanishes.

Prob. 2. The notation remaining, as in the last problem: let the center of gyration be required, while the beam \( AB \) is made to revolve round a center \( S \) at any variable distance from \( A \); and let \( w \) express the distance of the center of gyration from \( S \). Then we shall have

\[ w = \sqrt{\frac{\text{flux} \cdot x^2 \times \dot{x}}{\nu}} = \sqrt{\frac{x^2-3\nu x+3x^2}{3}}. \]

Hence if \( x = 0 \), \( w = \nu \sqrt{\frac{1}{3}} \), and when \( x = \frac{2}{3} \), so that \( S \) may be in the center of gravity of \( AB \), then \( w = \frac{1}{2} \sqrt{\frac{1}{3}} \). When \( x = \frac{1}{2}x \), \( w \) becomes equal \( \frac{1}{2}x \) also, and in this case the center of gyration will be at the same distance from \( B \), that the center of rotation is from \( A \).

Cor.
Cor. 1. It appears from Cor. 1 of the last problem, that when the vibrations of a beam are the quickest possible, \( x \) is equal to \( -\frac{z}{2} + \sqrt{\frac{z}{2} + x} \), when the point of suspension is taken on that side the center of gravity towards A. Now since \( \frac{z}{2} \) is the distance of the center of gravity of the beam from A or B, it follows that \( \frac{z}{2} \sqrt{\frac{1}{3}} \) expresses the distance of the center of percussion from the center of gravity when the vibrations are the quickest possible. But it appears from this problem, that \( \frac{z}{2} \sqrt{\frac{1}{3}} \) expresses the distance of the center of percussion from the center of gravity, when the beam is made to revolve on that center. Therefore if the beam be suspended, by what in this case is the center of gyration, the vibrations will be the quickest possible.

Cor. 2. If the parts AS, SB be denoted by \( x \) and \( z \) as in Cor. 2, of the last prob., then \( w = \sqrt{\frac{\text{int.} z^2 x + \text{int.} x^2}{x + z}} = \sqrt{\frac{z^3 + x^3}{3z^2 + 3z}}. \)

Then if \( x = a \) and \( z \) become equal \( A B \), \( w = z \sqrt{\frac{1}{2}} \sqrt{\frac{z}{2}} \sqrt{\frac{1}{2}} \); and when \( x \) and \( z \) are equal, \( w = x \sqrt{\frac{1}{2}} \) or \( z \sqrt{\frac{1}{2}} = z \sqrt{\frac{1}{2}} \), and lastly, if \( x = z \), then \( w = \frac{1}{2} z \); all which are precisely the same as in the last problem.

Prob. 3. Let ABD be a solid beam of uniform thickness, having an angle at D, and let AD=DB, and AE = EB = x, and if the line ED be continued to the center of rotation S, then SE will be perpendicular to AB, and therefore AS = BS, and the beam will be in the same plane with the triangle ASB, and being made to revolve round the center S, retaining its position with respect to the line SE; it is required to determine the distance of the center of gyration from S.

Put DS = \( d \), and AD = BD = \( v \), and also ED = \( a \). Then

\[ AS \]
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$\text{AS} = v^2 + d^2 + 2ad$; and therefore $2v^2\dot{v} + 2d^2\dot{v} + 2ad \dot{v}$ will be the fluxion of all the $pd^2$ in the whole beam $ABD$.

Hence $w = \sqrt{\frac{2v^2\dot{v} + 2d^2\dot{v} + 2ad \dot{v}}{2v}} = \sqrt{\frac{v^2 + 3d^2 + 6ad}{3}}$

which, when $a$ vanishes, and the beam coincides with the line $AB$, becomes equal $\sqrt{\frac{v^2 + 3d^2}{3}}$—and if $d$ vanish $w = v \sqrt{\frac{1}{3}}$, for then $D$ will coincide with $S$ and $A D B$ will become two beams revolving on their extremities.

PROB. 4. LET $ABC$ represent a circular superfices, or solid wheel of uniform thickness, so that its weight may be as its area; and let it revolve round its center $S$; it is required to determine the distance $w$ of its center of gyration from $S$.

Put $A =$ the area of the circle whose diameter is unity, and $r =$ radius of $ABC$. Then $4 Ar^2$ is the area of $ABC$, whose fluxion is $8 Ar^2$; and therefore $8 Ar^2$ is the fluxion of all the $pd^2$ in $ABC$. Hence $w = \sqrt{\frac{\text{flu.} \cdot 8 Ar^2}{\text{flu.} \cdot 8 Ar^2}} = r \sqrt{\frac{1}{2}}$ which expression applies to every solid wheel of uniform thickness whose radius is $r$.

PROB. 5. LET $ABC$ and $abce$ be two concentric circles whose respective radii are $R, r$;—if the plane or solid wheel whose area is $abc$ be taken away, and the remaining plane or solid $Aa BbCc$, uniformly thick, be conceived to revolve round the center $S$; it is required to determine the distance of its center of gyration from $S$.

Put $A =$ the area of the circle whose radius is unity, then $4 A R^2$ will be the area of the greater circle, and then
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4 \pi r^2 \text{ the area of the less one; and therefore } 4 \pi R^2 - 4 \pi r^2 \text{ the area of the annulus. Now } 8 \pi R \pi \text{ is the fluxion of that area, and } 8 \pi R^3 \pi \text{ the fluxion of all the } \rho d^2. \text{ Hence } w = \sqrt{\frac{\text{flu. } 8 \pi R^3 \pi}{4 \pi R^2 - 4 \pi r^2}} = \sqrt{\frac{R^4}{2R^2 - 2r^2}}, \text{ which when } r \text{ vanishes, or the whole becomes solid, is equal } R \sqrt{\frac{r}{2}} \text{ as in the last problem.}

Cor. The sectors } S \alpha \text{ and } S \alpha, \text{ being to each other as the areas of their respective circles, and therefore as the squares of the diameter of these circles; and if } A \text{ in this case represent a similar sector of the circle whose radius is unity, the same result will be had with respect to the parts } A \alpha, \text{ and } B \delta, \text{ as in the former case, for the distance of the center of gyration from the center } S, \text{ will in this case be } \sqrt{\frac{R^4}{2R^2 - 2r^2}}. \text{ And when } r \text{ vanishes so that the sectors are complete sectors of the larger circle, than } w = \sqrt{\frac{R^2}{2}} = R \sqrt{\frac{r}{2}}.

Prob. 6. Let } A \ B \text{ be a beam uniformly thick, having its point of suspension at any variable distance from } A, \text{ as at } S; \text{ and let the beam be made to vibrate with any given angular velocity: it is required to determine that power, which acting at the extremity } B, \text{ would have the same angular force as the whole mass collected into, and acting at, the center of percussion.}

Let the length } A \ B \text{ be } v, \ A S = x, \text{ and } S \ B = v - x; \text{ and the distance of the center of percussion from } S \text{ equal } y: \text{ then by the general expression y = } \frac{\text{all the } \rho d^2}{\text{force of the body}}. \text{ Now if instead of taking all the } \rho d^2 \text{ in the whole beam, or supposing all the particles collected into the center of percussion, we conceive a power } p \text{ acting at the extremity } B \text{ such as multiplied by the square of its distance } S \ B, (v - x), \text{ its force shall be equal to all the } \rho d^2 \text{ in the whole beam: then will}
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\[ y = \frac{p' \times (v-x)}{v-x} \times \text{force of the beam}, \] and \[ p' = \frac{v}{v-x} \times \text{force of the beam}, \]

that is \[ p' = \frac{v}{v-x} \times \text{flu.} \quad \text{and} \quad \phi = \frac{v \times (v-x)}{4vx} \times \text{by the mass.} \]

And by substituting the value of \( y \), we have \[ p' = \frac{v^2 - 3vx + x^2}{3v^2 - 6v + 3x^2} \times \text{by the mass.} \]

a general expression for the value of \( p' \) for any beam of equal thickness, and whose weight is as the length.

Cor. 1. Now when \( x \) vanishes, \( p' = \frac{1}{3} \) the mass; so that when the beam is suspended at the extremity \( A \), then the weight which applied at the distance \( AB \) to an inflexible line vibrating with any given velocity, so as to have the same force as the mass of the beam collected into its center of percussion, and moving with the same angular velocity, shall be equal one-third the weight of the beam.

Cor. 2. If \( x \) be taken to \( v \) in the ratio of 1 to \( n \); then by substituting the value of \( x' \) in the above expression, \[ p' = \frac{n^2 - 3n + 3}{3n^2 - 6n + 3} \times \text{by the weight, when that weight is defined by} \ v \, \text{its length} \] and the weight of the shorter end, unity. Or suppose the whole weight to be \( W \), then \[ p' = \frac{n^2 - 3n + 3}{3n^2 - 6n + 3} \times W \, \text{and in this case the weight of the shorter end will be defined by} \ \frac{W}{n} \]
and that of the longer by \( \frac{n-1}{n} \), let \( W \) be what it will.

Cor. 3. When \( n = 2 \) then \( p' = \frac{1}{3} W \); but it must be remembered that \( p' \) is the power of the whole beam, since it is compared with the whole mass collected into the center of percussion; and is therefore the \( p' \) of both ends reduced to \( B \), and hence in cases where the two ends are equal, as in the present one, the \( p' \) of each end is \( \frac{1}{3} \) of half the beam, which together are equal to \( \frac{1}{3} W \), the \( p' \) of the whole beam.
PROB. 7. Let S be the center of rotation, and let
the beam be made to revolve horizontally with any
given angular velocity: it is required to determine
the $p'$ of the whole beam acting at B.

The notation being the same as in the last problem
and $w$ being the distance of the center of gyration
from S, then $w^2 = \frac{\text{all the } p\,d^2}{\text{the body } \text{the beam}}$; therefore we have

$$p' = \frac{\omega^2}{d^2} \times \text{the beam}, = \frac{\omega^2}{3v^2 - 3v + 3x^2} \times \text{the weight of the beam}$$

acting as in the last problem. Hence in this
case, if $x$ be to $v$ as $1$ to $n$, then

$$p' = \frac{n^2 - 3v + 3}{3n^2 - 6v + 3} \times W,$$

and when the two ends become equal, so that the
center of rotation coincides with the center of gravity,
then the beam may revolve either vertically or hori-
zontally, and the $p'$ of both ends together will be $\frac{1}{3}$
the weight.

Cor. 1. Other forms may be derived for the value
of $p'$, if the two arms be called $d$ and $b$, and their
weights $c$ and $d$ respectively. For by the general ex-
pressions

$$y = \frac{\text{force of the beam}}{p'\,d^2}, \quad \text{and } w^2 = \frac{\text{the beam}}{p'\,d^2}.$$

Now by

the first of these, if $p'$ be the power of the whole
beam acting at B, we have $p' = \frac{y}{d^2}$ the force of the
beam $= \frac{b^3 + a^3}{3b^3 + 3ab^2} \times c + d$; and by the second, $p' = \frac{\omega^2}{d^2} \times$

the beam $= \frac{b^3 + a^3}{3b^3 + 3ab^2} \times c + d$; in both cases $= \frac{b^3 + a^3}{3b^3 + 3ab^2} \times$
the weight of the beam. Now when $a = b$, $p' = \frac{c + d}{3}$
or $\frac{1}{3}$ the weight; and if $a = 0$, $p' = \frac{1}{3}$ the weight also.

Cor. 2. It further appears, that in all cases of an
oscillating motion of the beam, the $p'$ is defined by
multiplying the distance of the center of percussion
from the center of suspension, by the mass or
weight, and dividing by the square of the distance
at which $p'$ is to act: and that in all cases of a
gyrating motion of the beam, the $p'$ is defined by mul-
tiplying the square of the distance of the center of gyra-
tion from the center of rotation, by the mass or weight,
and dividing by the square of the distance at which $p'$ is to
act. Hence it follows in both cases, that if the $p'$ of the same beam or body, be reduced to different distances, its value will be inversely as the squares of these distances.

**Prob. 8.** Let $A$ be the area of the circle whose diameter is unity, and $r = \text{the radius of the circular plane } ABC$: and let $p$ represent the periphery of a circle, or a ring into which we will conceive as many particles collected, as, with any angular velocity, shall have the same force, as the mass of the circular plane, (or solid wheel of the same diameter, and uniformly thick,) collected into a circle, whose radius is the distance of the center of gyration from the center C, moving with the same angular velocity: the value of $p'$ is required.

Now it is evident from the nature of the problem, that $p'r^2$ will be equal to all the $pd^2$ in $ABC$. And since $4Ar^2$ is the area of $ABC$, we have $\omega^2 = \frac{p'r^2}{4Ar^2}$ and $p = \omega^2 \times 4A = 2Ar^2$ by substituting the value of $\omega^2$ which value is equal half the mass of $ABC$, whether it be a circular plane or solid wheel.

Now this power $p'$ may be either a ring, as is here conceived, or a weight equal to that of the ring, divided into two equal parts, each acting at the extremity of a lever, revolving on its center, and whose length is equal to the diameter of the ring; and in the same manner we may conceive the $p'$ in problem 7 to be resolved into a ring of equal weight whose diameter is equal $AB$. 
PROB. 9. Let it be required to determine the $p'$ of the whole beam $AB$ in Prob. 3, acting at $A$, while the beam revolves horizontally on the center $S$.

Then $p = \frac{w^2}{d^2} \times \text{the weight} = \frac{w^2 + 3d^2 + 6ad}{3w^2 + 3d^2 + 6ad} \times W$. Now in this case, when $a$ vanishes, then $p'$ becomes $= \frac{w^2 + 3d^2}{3w^2 + 3d^2} \times W$; when $d$ vanishes, and $D$ coincides with $S$, in which case $v$ becomes equal $AS$, and $AD$ and $DB$ become two beams revolving on one end each; then the $p'$ of both the beams together is equal $\frac{1}{3} W$, where $W$ is the weight of both the beams; and therefore the $p'$ of each, acting at the extremity $A$ or $B$, is $\frac{1}{3}$ its own weight, the same as in Prob. 6, Cor. 1.

PROB. 9. Let the annulus in Prob. 5 be proposed, to determine the $p'$ of the whole, acting at the distance $SA$, any where in the circumference.

Then since $w^2$ is equal $= \frac{R^4}{2r^2 - 2r^4}$, where $R = SA$, and $r = SA$, we shall have $p' = \left(\frac{w^2}{d^2} \times \text{the body}\right) \frac{R^4}{2r^2 - 2r^4} \times \frac{4 \times R^2 A - R^2 A}{r^2} = \frac{R^2}{r^2 - r^2} \times \frac{1}{2}$ the weight of the annulus; and when $r = 0$, so that the interior circle may vanish, and $ABC$ become an entire circle or solid wheel, then $p' = \frac{1}{2}$ the mass, the same as in Prob. 8.

Cor. If $A$ represent the area of a sector of a circle whose diameter is unity, similar to the sectors $AS$ or $a$ as in Cor. of Prob. 8; then the $p'$ of both the parts $Aa$ and $BC$ together, will be equal $\frac{R^2}{r^2 - r^2} \times 2 \frac{AR^2 - 2Ar^2}{r^2 - r^2} = \frac{R^2}{r^2 - r^2} \times \frac{1}{2}$ the mass of the two parts together.

PROB. 10. Let $AA$, $BB$, $CC$, be a solid ring, having a solid beam whose center is the center of the annulus, as in the next figure; it is required to determine the $p'$ of the whole acting at $B$.

Let
Let $W'$ express the weight or mass of the annulus; and $w$ that of the cross beam $a\,b$, which beam is of equal thickness. Then the $p'$ of the beam at $b$ is $\frac{1}{3}w$ by Prob. 6, Cor. 3; which reduced to $B$, is $\frac{r^2w}{3r}$, by Cor. to Prob. 7, and the $p'$ of the ring is $\frac{r^2}{r^2-r^2} \times \frac{1}{2} W'$, by the last Prob. Hence $p'$ of the whole is $\frac{r^2}{r^2-r^2} \times \frac{w'}{2} + \frac{r^2w}{3r}$.

Cor. If $W'$ express the weight of the two ends $Aa$, $Bb$, being parts of the annulus, whose center is $S$, and if the weight of the beam $ab$, whose center is also $S$, be expressed by $w$, as before; then the $p'$ of the whole beam, and both ends together, will be $\frac{r^2}{r^2-r^2} \times \frac{w'}{2} + \frac{r^2w}{3r}$.

Prob. 11. When the two circular ends are braced to the beam $a\,b$ by the braces $cd$, $cd$, on both sides of the beam: it is required to determine the $p'$ of the whole, acting at $B$, when moving on the center $S$.

Let $W'$ and $w$ represent the weight of the two circular ends, and the beam $a\,b$, respectively, as in the last Prob.; and let the length $cd$, be $v$, and the weight of the two braces at one end, be $w'$. Now if $s$ be supposed the center of rotation, then the case in Prob. 9 would apply. And because $sc$ varies so little from $se$ or $Sa$, in a beam of considerable length, that any deviation from the truth which might arise from considering $sc$ as $r$, would be so trifling as to render any further investigation
On the maximum of mechanical powers, and

investigation unnecessary. Supposing then $sc = Sa$; and call $de = a$, then $sd = r - a$ very nearly. Then by Prob. 9, the $p'$ of the braces at one end is 

$$\frac{v^2 + 3. r - a^2 + 6ar - a^2}{3v^2 + 3. r - a^2 + 6ar - a^2} \times w',$$

or equal $kw'$, by substituting $k$ for 

$$\frac{v^2 + 3. r - a^2 + 6ar - a^2}{3v^2 + 3. r - a^2 + 6ar - a^2}.$$ 

And therefore $2kw'$ will be the $p'$ of all the braces at the distance $SB$, then by Cor. 2 of Prob. 7. As $R^2: r^2 :: 2kw' : \frac{2kw'r^2}{r^2}$, the $p'$ of all the braces reduced to the distance $SB$. Hence 

$$\frac{r^2}{r^2 - r^2} \times \frac{w'}{2} + \frac{r^2w}{2} + \frac{2lww'r^2}{r^2}$$

expresses the $p'$ of the beam, circular ends and braces together, very nearly.

Hence is obtained the value of $p'$ in the most useful cases that occur; and this $p'$ being the power, which acting at the extremity of the different figures here enumerated, will give the same angular velocity, as their respective masses acting at the center of percussion or gyration: it is therefore the masses themselves reduced to the distance from the center of motion, at which, if a weight be applied, to act as a power for overcoming a resistance, this $p'$ will be so much in addition to the mass to be moved by that weight, and must therefore be considered in computing the effects of all machines after they acquire a velocity. The use of these results will appear in the following problems:

Prob. 12. Let $AB$ be a beam of equal thickness, whose weight call $W$, and whose center of motion $C$, is in the center of the beam. Then if $P$ be a given weight, acting as a power to move the weight $x$; the value of $x$ is required when its momentum is the greatest possible.

Since
Since \( W \) expresses the weight of the beam, \( \frac{1}{3}W \) will express the \( p' \) of the whole beam acting at \( B \). And since both ends are of equal length, \( P-x \), will be the moving power, and \( P+\frac{1}{3}W+x \) is the mass to be moved, with respect to angular velocity. Hence \( \frac{P-x}{P+\frac{1}{3}W+x} \) is the accelerative, and is as the velocity with which \( P \) will move after having overcome the resistance. But since \( AC=CB \), this quantity is also the accelerative force of \( x \), and therefore the momentum of \( x \) is \( \frac{Px-x^2}{P+\frac{1}{3}W+x} \), which being a maximum, its fluxion is equal nothing: hence \( P\dot{x}-2\cdot v\dot{x} \times P+\frac{1}{3}W+x-x \times P.v-x^2=0 \), from which, when reduced, we have \( x = \sqrt{\frac{w^2+gPw+3P^2}{3} \cdot \frac{w}{n}} \).

Prob. 13. Let the arms of the beam \( AB \) be of unequal lengths, and let the whole beam be to the shorter end, both in length and weight, as \( n \) to unity. And let \( W \) express the weight of the whole beam. Then if \( P \) as a power be suspended at \( B \), it is required to determine the weight \( x \); so that it may ascend, when overcome by \( P \), with the greatest momentum possible.

Then by Problem 6, Cor. 2, the \( p \) of the whole beam is equal
\[
\frac{n^2-3n+3}{3n^2-6n+3} \times W = g W,
\]
by putting \( x \). Then \( g = \frac{n^2-3n+3}{3n^2-6n+3} \) and the weight of the shorter end will be \( \frac{w}{n} \), that of the longer \( \frac{n-1}{n} \), by the same Cor. Now the weight of the longer arm being \( \frac{n-1}{n} \), its weight when reduced to \( B \) will be \( \frac{w}{2n} \), and by the same reasoning the weight of the shorter end \( AC \), reduced to \( A \), will be \( \frac{w}{2n} \); and as \( n-1 \) \( (BC) : 1 \) \( (AC) : : \frac{w}{2n} : \frac{w}{2n-n-1} \) = the weight of \( AC \) reduced to \( B \). Again; as \( n-1 : 1 : : x : \frac{w}{n-1} \)
= the weight of \( x \) reduced to \( B \). Hence \( \frac{w}{2n-n-1} + \frac{w}{n-1} \)
is that weight, which if applied at \( B \), would precisely balance the end \( AC \), together with the weight \( x \). Hence
Hence \[ \mathbf{P} + \frac{n-1 \mathbf{w}}{2n} - \frac{\mathbf{w}}{2n_1-1} - \frac{x}{n_1} \] will be the motive force or moving power. Then again, when the bodies are in motion, \( g \mathbf{W} \) is the \( \mathbf{p} \) of the whole beam acting at \( B \): and \( \frac{x}{n_1-1} \), the value of \( x \) when reduced to \( B \), it follows that \[ \mathbf{P} + g \mathbf{W} + \frac{x}{n_1-1} \] is the whole mass compared at \( B \) with respect to angular velocity.

Hence \[ \mathbf{P} \times g \mathbf{W} + \frac{x}{n_1-1} \] is the accelerative force at \( B \);—or the accelerative force of \( \mathbf{P} \);—or of \( x \) reduced to \( B \). Then as \( \frac{n-1}{1} : 1 : \) \[ \mathbf{P} + \frac{n-1 \mathbf{w}}{2n} - \frac{\mathbf{w}}{2n_1-1} - \frac{x}{n_1} \] the accelerative force of \( x \) suspended at \( A \): which, by putting \( q \) for \[ \frac{n-1 \mathbf{w}}{2n} - \frac{\mathbf{w}}{2n_1-1} \], and \( t \) for \( n-1 \). \( \mathbf{P} + n-1 \cdot g \mathbf{W} \), will be expressed by \[ \frac{n-1 \cdot q - x}{n-1} \cdot t + n-1 \cdot x \] : and therefore the motive force, or momentum of \( x \) will be \[ \frac{n-1 \cdot q - x^2}{n-1 \cdot t + n-1 \cdot x} \], whose fluxion being equal to nothing, we have \[ n-1 \cdot q \dot{x} - 2 \cdot x \dot{x} \cdot n-1 \cdot t + n-1 \cdot x - n-1 \cdot x \dot{x} \]

\( q \cdot x - x^2 = 0 \), and \( x = \sqrt{t^2 + n-1 \cdot q - t} \), a general expression, when the shorter end is unity, and the whole length of the beam, any whole number. When \( n \) is 2, so that the arms are equal, then \( x = \frac{\sqrt{w^2 + 9pw + 18p^2 - w - 3p}}{3} \) as in the last.

Prob. 14. If the two arms be of any given length whatever, the shorter being expounded by \( a \), and the longer by \( b \); and their weights by \( c \) and \( d \) respectively: then if \( \mathbf{P} \) as in the former case be applied to act as a power at \( B \); it is required to determine the value of \( x \) in terms of \( a \) and \( b \), in case of a maximum.
Now by Problem 7, Cor. \( \frac{a^3+b^3}{3ab^2+3b^3} \times c + d \) will express the \( p' \) of the whole beam reduced to B. Hence \( P + \frac{a^3+b^3}{3ab^2+3b^3} \times c + d + \frac{ax}{b} \), will express the mass when reduced to B, as to angular velocity. Then since \( \frac{c}{2} \) is the weight of the shorter end reduced to A; \( \frac{ac}{2b} \) is the weight which applied at B, would balance the shorter end. Therefore \( \frac{ac}{2b} + \frac{ax}{b} \) applied at B, would sustain the shorter end, together with the weight \( x \), in equilibrio. Hence \( P + \frac{d}{2} - \frac{ac}{2b} - \frac{ax}{b} \) is the moving power. And therefore \( \frac{r + \frac{d}{2} - \frac{ac}{2b} - \frac{ax}{b}}{r + \frac{a^3+b^3}{3ab^2+3b^3} \times c + d - \frac{ax}{b}} \) is the accelerative force of \( P \), or of \( x \) reduced to B, and

\[ \frac{ar + \frac{ad}{2} - \frac{a^2c}{2b} - \frac{a^2x}{2b^2}}{r + \frac{a^3+b^3}{3ab^2+3b^3} \times c + d - \frac{ax}{b}} \]

is the accelerative force of \( x \) suspended at A: which, by substituting \( q \) for \( a \), \( P + \frac{ad}{2} - \frac{a^2c}{2b} \), and \( t \) for \( b \), \( P + \frac{a^3+b^3}{3ab^2+3b^3} \times c + d \), becomes \( \frac{qb - a^2x}{tb + abx} \).

Hence \( \frac{qb - a^2x^2}{tb + abx} \) is the motive force, whose fluxion being equal to \( 0 \), we have \( \frac{qbx - 2ax^2}{tb + abx} = \frac{qbx - a^2x^2}{tb + abx} = 0 \), and \( x = \frac{1}{a} \sqrt{\frac{a^2 + bqt}{t} - \frac{1}{t}} \). Now if \( a \) be unity, then \( x = \sqrt{t^2 + bqt - t} \), the same as in the last Problem, when \( \frac{n}{n-1} \) will be equal \( b \).

Note. If in the accelerative force of \( P \), \( q \) be substituted for \( P + \frac{d}{2} - \frac{ac}{2b} \) and \( t \) for \( P + \frac{a^3+b^3}{3ab^2+3b^3} \cdot c + d \) then the accelerative force of \( x \) is \( \frac{abq - a^2x}{b^2t + abx} \), and its momentum \( \frac{abq - a^2x^2}{b^2t + abx} \), from whence \( x = \frac{b}{a} \sqrt{t^2 + t q - \frac{b}{a} r} \), and in the preceding problem, if \( q \) be put for \( P + \frac{n-1}{2n} \cdot \frac{w}{2n} - \frac{w}{2n} \), and \( t \) for \( P + gW \), in the accelerative force of \( P \), and proceeding to find the accelerative force of \( x \), &c. then \( x = n-1. \sqrt{t^2 + tq - n-1. t} \).
Prob. 15. Let ABC be a solid wheel of uniform thickness and density, revolving on its center S: and let its weight be W, and if P be a weight applied as a power, suspended to a line passing freely over the wheel, and to which line is fixed the weight x at the opposite end. The value of x is required, in case of a maximum.

Since the weight and power are equally distant from the center of motion, P—x will be the moving power: and by Problem 8, $\frac{1}{2}W$ is the $p'$ of the wheel. Hence $P+\frac{1}{2}W+x$ is the mass to be moved, as to angular velocity. Then will $\frac{r-x}{r+\frac{1}{2}w+x}$ be the accelerative force and $\frac{ex-x^2}{r+\frac{1}{2}w+x}$ the motive force of x, whose fluxion being equal to nothing, we have $P^2x+\frac{1}{2}PWx=2PWx=Wxx-x^2x=0$ and $x=\sqrt[ ]{W^2+6PW+8P^2}-2P-W$.

Prob. 16. Let a, b, be two circular ends, fixed to the beam a b, these ends being of equal thickness as well as the beam. Let the weight of both the former together be $W'$, and that of the latter $w$: and let the beam move on its center S.—Then if P be a given weight, acting as a power at B, it is required to determine the weight x suspended at the other end under the circumstances of a maximum.

Now if $SB=R$ and $s b=r$, then by Problem 10, the $p'$ of the beam and heads, reduced to B, will be $\frac{b w'}{2}+\frac{r^2 \omega}{3r^2}$, where $h=\frac{R}{r^2-r^2}$. And since the beam and
and heads are suspended in the common center of gravity, \( P - x \) will be the moving power, and \( P + \frac{b w^2}{2} + \frac{r^2 w}{3 \alpha^2} + x \) the sum of all the mass after being in motion. Hence \( P + \frac{b w^2}{2} + \frac{r^2 w}{3 \alpha^2} + x \) is the accelerative, and \( P + \frac{b w^2}{2} + \frac{r^2 w}{3 \alpha^2} + x \) the motive force of \( x \), equal \( \frac{p x - x^2}{t + x} \), by putting \( t = P + \frac{b w^2}{2} + \frac{r^2 w}{3 \alpha^2} \), and by taking its fluxion equal nothing, \( x = \sqrt{t^2 + tP + t} \).

**Prob. 17.** To determine \( x \) under the circumstances of a maximum, when the two circular ends are braced to the main beam \( ab \), by the braces \( v \), whose weight altogether is \( cw' \).

Then, by Problem 11, the \( p' \) of two of the \( v's \) at one end, reduced to \( B \), is \( \frac{a^2 + 3r - a^2 + 6ar - a^2 + r^2 w}{3 \alpha^2 + 3r - a^2 + 6ar - a^2} \). Hence the \( p' \) for all the braces reduced to \( B \), will be \( \frac{2kr^2 w'}{r^2} \), and by the same problem \( \frac{b w^2}{2} + \frac{r^2 w}{3 \alpha^2} + \frac{2kr^2 w'}{r^2} \) will be the \( p' \) of the whole beam, heads and braces, reduced to \( B \). Now since the ends are in equilibrio, exclusive of the weight, \( P - x \) will be the moving power, and \( P + \frac{b w^2}{2} + \frac{r^2 w}{3 \alpha^2} + \frac{2kr^2 w'}{r^2} \) is the motive force of \( x \), which by putting \( P + \frac{b w^2}{2} + \frac{r^2 w}{3 \alpha^2} + \frac{2kr^2 w'}{r^2} = t \), becomes \( \frac{p x - x^2}{r + x} \), and by making its fluxion equal to nothing, we shall have \( x = \sqrt{t^2 + tP - t} \), as in the former case. And this form will always obtain for all beams moving on their centers, after determining the value of \( p' \), and substituting \( t \) for the known terms in the denomination.
Prob. 18. Let ABD be a solid wheel, whose weight is W, and CC be an axle, but whose weight is so small, compared with that of the wheel, as not to be regarded. Then if P, as a power, be suspended to a line passing round the circumference of the wheel, whose radius call b; and x a weight to be raised suspended to a line passing round the axle, whose radius let be a: it is required to determine x, so that its effect may be a maximum.

Since W is the weight of the wheel, \( \frac{1}{2} W \) is the \( \mathcal{P} \) of the whole, acting at B, when in motion by Problem 8; and \( \frac{ax}{b} \) is the value of \( x \) reduced to B. Therefore \( P + \frac{1}{2} W + \frac{ax}{b} \) is the mass to be moved, after \( x \) is overcome by \( P \): and \( P - \frac{ax}{b} \) will be the moving power. Hence \( P + \frac{1}{2} W + \frac{ax}{b} \) is the accelerative force of \( P - \frac{ax}{b} \) by putting \( t = P + \frac{1}{2} W \). Then as \( b : a : \frac{vb - ax}{tb + ax} : \frac{abv - a^2x}{tb^2 + bax} \) is the accelerative force of \( x \), and therefore \( \frac{a^2v - a^2x^2}{tb^2 + bax} \) its motive force when suspended at C, which by making its fluxion equal to nothing, we shall obtain \( x = \frac{b}{a} \sqrt{t^2 + tP - \frac{b}{a} r} = \frac{b}{a} \sqrt{w^2 + 6rw + 8r^2 - 2p - w} = \sqrt{w^2 + 6rw + 8r^2 - 2p - w} \), when \( a \) and \( b \) become equal the same as in Problem 15.

Prob. 19. Let the wheel and axle be as in the last, with this difference, that the weight (\( w \)) of the axle projecting on each side the wheel, be considered.
Then \( \frac{1}{2} W \) is the \( p' \) of the wheel at B, to the center S, (for we shall suppose the part of the axle which passes through the wheel to be of the same density with the wheel;) and \( \frac{1}{2} w \) the \( p' \) of the axle at C, and which, reduced to B, will be \( \frac{a^2 \omega}{2b^2} \). Hence

\[
\frac{b^2 \omega + a^2 \omega}{2b^2}
\]

is the \( p' \) of the wheel and axle together, at B. Then will

\[
P + \frac{b^2 \omega + a^2 \omega}{2b^2} + \frac{a \alpha}{b}
\]

express the mass after being in motion: and

\[
P - \frac{a \alpha}{b}
\]

as in the former case, being the moving power, by putting

\[
t = P + \frac{b^2 \omega + a^2 \omega}{2b^2},
\]

and proceeding as in the former case, we shall have

\[
x = \frac{b}{a} \sqrt{t^2 + tP - \frac{b}{a} \cdot t};
\]

or by restoring the value of \( t \),

\[
x = \frac{b}{a} \sqrt{\frac{2b^2 \omega + b^2 \omega + a^2 \omega^2}{2ab} + \frac{2b^2 \omega + b \cdot \omega + a^2 \omega b^2}{2ab} - \frac{2b^2 \omega + b^2 \omega + a^2 \omega}{2ab}}.
\]

**Scholium.** These problems comprehend all the cases that can be of general use in combining the lever with the wheel and axle; or in their separate application, when the power is acted on by gravity, and whose motion is uniformly accelerated, the same as that of bodies falling freely through any given space. And since, in the preceding Problems, gravity, or the space which a body falls freely through in the first second of time, is considered as unity, it follows that the accelerative force of \( x \) in all these cases being multiplied by \( 16 \times x \) feet, (or what may be the measure in any particular latitude,) will give the space in feet that \( x \) would pass through in the first second of time, and from which the space which would be passed over in any other time may be computed, since those spaces are as the squares of the times in which they would be passed over from the beginning. It is also easy to compute the velocity of \( x \) after passing through a given space in any given time, for that velocity will be in the subduplicate ratio of the accelerative force: and hence another maximum may be determined, viz. the greatest possible effect of \( x \), after passing through a given space. For if the square root of the accelerative force be multiplied by \( x \), the product will be as the momentum of \( x \) for any space passed over.
over. Or if the velocity of \( x \), after having passed through any space in any given time, \( T \) be multiplied by \( x \), then that product will evidently be the momentum of \( x \), after having passed through that space: and therefore, by the well known method of fluxions, the value of \( x \) may be obtained under the circumstances of a maximum: and this will apply to all the foregoing cases. But to select one of the most useful, let it be that in Prob. 17, where the lever moves on its center of gravity, which it is generally made to do when a power is applied at one end to raise a weight at the other to a certain height, and then return to repeat its stroke, and so continue by the alternate acting and ceasing of the power. Now, in the case alluded to, the accelerative force of \( x \) is as \( \frac{p-x}{t+x} \), therefore \( x \sqrt{\frac{p-x}{t+x}} \) will be as the momentum of \( x \) after being urged by the force by which it would be carried through a space, that should be to the space a body would be carried through by gravity in the same time, as \( \frac{p-x}{t+x} \) to unity. Hence, by making the fluxion of \( x \sqrt{\frac{p-x}{t+x}} \) equal to nothing, we shall have \( 2P \frac{t-x}{t+x}x \times t - x - x \times P \frac{x^2 - x^2}{t+x} = 0 \), and therefore \( x = \sqrt{\frac{p^2 + p^2 + px + gx^2 + p - 3t}{4}} \). Or if the velocity of \( x \), after having passed through any space in any given time, \( T \) be multiplied by \( x \), the momentum is obtained at the end of that time, let the space passed over be what it will. Now in the above case \( \frac{p-x}{t+x} \times 16 \frac{1}{12} \) feet, is the space which \( x \) would pass through in the first second of time: hence as \( 1' : 2 \) : \( T^2 : \frac{P-x}{t+x} \times 16 \frac{1}{12} : \frac{P-x+T^2}{t+x} \times 16 \frac{1}{12} \) feet, equal to the space that \( x \) would pass over in the time \( T \); therefore \( \sqrt{\frac{P-x+T^2}{t+x}} \times 16 \frac{1}{12} \) is the velocity at the end of that time, and \( x \sqrt{\frac{P-x+T^2}{t+x}} \times 16 \frac{1}{12} = T \sqrt{16 \frac{1}{12}} \times \sqrt{\frac{x^2-x^2}{t+x}} \) is the momentum, which, by making the fluxion equal to nothing, will give \( x \) as before.

It will be unnecessary to give examples of all the foregoing
THE EFFECTS OF MACHINES WHEN IN MOTION.

foregoing cases, as it is easy to assign numbers for the given terms, and from thence compute the value of \( x \). But as the 17th Prob. is the most complicated with respect to the \( p' \) so often mentioned, and because the lever there represented is nearly the form of those generally used in machines that act with a reciprocating motion, I will subjoin an example for determining the value of \( x \), both after a given time, and after passing through a given space; and then proceed to compute the greatest possible effects of the steam engine, agreeable to the principles laid down in this theory.

Example:—Let then the weight \((w)\) of the great beam \( ab \) (see the figure in Problem 17) be ten cwt. its length \((2r)\) equal twenty feet. The weight of the two circular ends \((W') = two \) cwt. The weight of all the braces \((2w') = one \) cwt. their length \((v)\) = five feet. Then let \( SB \) (R) be twelve feet; \( sd \) \((a)\) = six feet, and therefore \( r - a = four \) feet: and make P = ten cwt. Now \( \frac{a^2 + r - a^4 + 6x - a^5}{3a^2 + r - a^5 + 6x - a^5} = \frac{217}{267} = 0.8127 \)

= \( k \), and \( \frac{2lr^2w'}{R^2} = 1,128 \) the \( p' \) of all the braces reduced to B. Then again \( \frac{R^2}{2a^2} = 3,273 = h \), \( \frac{b{w'}}{2} = 3,273 \), \( \frac{r^2w}{3R^2} = 2,546 \). Therefore we have \( P + \frac{2lr^2w'}{R^2} + \frac{b{w'}}{2} + \frac{r^2w}{3R^2} = 1694.7 \text{lb.}=t \); and by substituting the value of \( t \) thus found, in the equation \( \sqrt{t^2 + tP} = t \), will give \( x = 442 \) lb. very nearly, when its effect is greatest after a given time, and if the values of \( t \) and \( P \) be put in the equation \( \frac{\sqrt{p^2 + 4rt + 9r^2 + p - 3t}}{4} \), we have \( x = 631.5 \) lb. when its effect is greatest after passing through a given space. Had the weight of the lever not been considered, \( x \) in the first case would have been 414.2, and in the second 618.04 nearly.

Now to compute the greatest effects of the steam engine on the principles here laid down, without entering into a minute description of that machine, let \( c \) be the diameter of the cylinder into which the steam is conveyed, and \( p \) the diameter of the pump. Then if \( a \) denote the weight of the atmosphere on
a circular inch, \( ac^2 \) will express the weight of the atmosphere on the piston of the cylinder, which is therefore the power of the engine, and answers to \( P \) in the former case. And by an easy computation, if \( f \) represent the depth of the pit in fathoms, it will be found that \( 2p^2f \) will nearly express the weight of the water in pounds, which is to be raised through a given space, by the power of the cylinder, and which therefore answers to \( x \). Now in the usual theorems that have been deduced for ascertaining the different values of \( c, f, \) and \( p, ac^2 \) and \( 2p^2f \) have been made equal to each other, so that the weight and power must have been supposed in equilibrio, which is never the case. But let us allow the weight of water in the pump to be overcome by the superior weight of the atmosphere in the cylinder the moment the steam is condensed, and then the case becomes precisely the same as when the weight \( P \) is suspended at one end of the lever; and like that weight the atmosphere will descend with an accelerated motion, and raise the column of water at the opposite end.

Now since the value of \( P \) is here given in terms of \( c \) the diameter of the cylinder, it will be necessary to substitute another quantity for \( t \) in the general equations. Let then \( \frac{2hr^2w}{x^2} + \frac{bw}{2} + \frac{r^2w}{3x^2} \) be equal \( d \); then \( P + d (ac^2 + d) = t \); and therefore the equations \( \sqrt{t^2 + tP - t} \) and \( \frac{V^2 + \frac{10p + gd^2 + v - 2t}{4}} \) become \( \sqrt{2P^2 + \frac{3Pd + d^2 - P - d}{4}} \), respectively; and by putting \( 2p^2f \) for \( x \), and \( ac^2 \) for \( P' \), we shall then have \( 2p^2f = \sqrt{2ac^2c^2 + 3adc^2 + d^2 - ac^2 - d} \) for a general equation when the effect is greatest after a given time, and \( 2p^2f = \frac{\sqrt{20ac^2 + 28ac^2 + gd^2 - 2ac^2 - 3d}}{4} \), when the effect is greatest after passing through a given space; and from which equations may be deduced the following values of \( c, p, \) and \( f \), viz.

When
When the effect is a maximum in a given time,

\[ 1, c = \sqrt{\frac{2 \pi f^2 + 8 \pi f d + d^2}{2a}} \]

\[ 2, p = \sqrt{\frac{2a^2 - 3ac^2 + d^2}{2f}} \]

\[ 3, f = \sqrt{\frac{2a^2 - 3ad^2 + d^2}{a^2 - d}} \]

When the effect is a maximum after passing over a given space,

\[ 4, c = \sqrt{\frac{2a^2 + 23ad^2 + 3d^2}{8f}} \]

\[ 5, p = \sqrt{\frac{2a^2 + 23ad^2 + 3d^2}{8f}} \]

\[ 6, f = \sqrt{\frac{2a^2 + 23ad^2 + 3d^2}{8f}} \]

Now in the application of the above equations let the diameter of the cylinder \( c \) be equal 30 inches, and the depth \( f \) of the well be 27 fathoms; and \( a = 6 \), and also \( d \) \( t - P = 69.5 \) very nearly, as before. Then if these values be put in the 2d equation, \( p \) will be equal 6.49 inches nearly, which by the common method must have been 10 inches. Then if \( ac^2 \) and \( 2p'f \) be substituted for \( P \) and \( x \) in the expression for the accelerative force, we have

\[ \frac{ac^2 - 2p'f}{a^2 + d + 2p'f} \times 16 \frac{1}{12} = 6 \text{ feet very nearly for the space through which the water would ascend in the first second of time. And if 6 feet be allowed for the length of one stroke of the pump, then the ascent of that stroke is performed in 1" of time. Now the contents of a cylinder whose length is 6 feet, and diameter 6.49 inches is 8.43 gallons nearly, which is the greatest quantity possible that can be raised in 1" of time by the pressure of the atmosphere on a circle of 30 inches in diameter. Then if the piston be made to return in the same time, 2" will be the time of one entire stroke, which is at the rate of 30 in the minute, which multiplied by 8.43 gallons gives 253 gallons per minute, or 241 hogsheads in the hour.}

If the above values of \( a, c, f \) and \( d \) be put in the 5th equation, we shall have \( p = 7.8 \) inches nearly and

\[ \frac{ac^2 - 2p'f}{a^2 + d + 2p'f} \times 16 \frac{1}{12} = 3.55 \text{ feet for the space which the water would ascend through in the first second of time, then as } 3.55 : 1''^2 : : 6 : 1'', 7 = \text{ the square of the time} \]
On the maximum of mechanic powers, and

time in passing through 6 feet, hence \( \sqrt{1''7} = 1',34 \) nearly is the time, which if the piston return in the same time, will give 2',68 for the time of one entire stroke, being at the rate of 22,4 nearly in the minute. Now a cylinder whose height is 6 feet, and diameter 7,8 inches contains 12,23 gallons, and this is the greatest possible quantity that can be raised through a space of 6 feet in 1"34 of time, by a cylindrical column of the atmosphere, whose diameter is 30 inches. Then 22,4 \( \times \) 12.23 gives 274 gallons nearly in the minute, or 261 hogsheads in the hour, which is more by thirty-three hogsheads than what is computed by the common method, where the diameter of the pump would be ten inches. But by that method no accelerative force is allowed, except what must arise from some additional weight given to the steam piston; and it may not be improper to observe here, that if ten be put for \( p \) in the expression \( \frac{ae^2 - 2pf}{ae^2 + d + 2pf} \), it will vanish, for then the power of the cylinder and the weight of the water are in equilibrio, and the accelerative force is equal to nothing.

If these two cases be compared with each other, in order to know which would be the most proper for obtaining the dimensions of the cylinder and pump, we must observe that in the first, where the effect is required to be a maximum in a given time, the velocity is much greater than in the other, and the time in passing over six feet consequently much less; and therefore, by giving the greater number of strokes in the hour, the effect is so much more interrupted by the returning of the pump piston, and of course the whole effect within that hour is diminished, and in fact is less than in the second case, as appears from the foregoing computations. But were the pump in the first case allowed to ascend till 1"34 was elapsed (which is the time in the second) it would pass through the space of ten feet nearly, and in the course of the hour would raise 311 hogsheads, which is more by fifty hogsheads than in the maximum
imum for space, when \textit{that space} is six feet. But the great velocity with which the machine must move, is a sufficient objection against the maximum in time; because however well proportioned the parts might be, the perpetual reciprocation, where the motion is very great, must tend to injure the whole apparatus; and on this account, the latter case is much to be preferred.

I have said nothing of friction, because in the cases I have considered, it must be but trifling, except in the pistons; and I have not mentioned the chain and pump rods as separate quantities from $ae^2$ and $2p^2f$; though, to be minutely correct, this ought to have been done; but as this part of the apparatus will act at both ends of the lever, and whose weight compared to those of the water, and the atmosphere, will be but small, no great error will arise from this neglect. And as my object has been to establish a general theory, upon principles that admit of further prosecution to any degree of accuracy, I feel less anxious as to these particulars.
VIII.

On the Religion and Literature of the BURMAS.

BY FRANCIS BUCHANAN, M. D.

In the celebrated island of Ceylon, in the extensive empire of the Burma monarchs, and in the kingdoms of Siam and Cambodia, the prevailing religion is that of BOUDDHA, or GODAMA; and followers of the same doctrine are probably dispersed all over the populous and wide dominions of China, Cochinchina, Japan, and Tonkin. However absurd the tenets of this religion may be, yet, as influencing the conduct of so large a proportion of mankind, it becomes an object of great importance in the history of the human race. To those in particular who study the history and antiquities of Hindustan, a knowledge of the doctrine of GODAMA will, I doubt not, be highly curious; as I think that Mr. CHAMBERS, the most judicious of our Indian antiquaries, has given very good reason for believing, that the worship of BOUDDHA once extended all over India, and was not rooted out by the Brahmens in the Decan so late as the ninth, or even as the twelfth century of the Christian æra.

Nor will this opinion, of the late introduction of the superstition now prevailing in Hindustan, be contradicted by the almost singular remain of Hindu history; the only one which has escaped the destructive research of the cunning Brahmen: I mean the history of Cashmere presented to the Sultan ACHBER on his first entrance into that kingdom. We are told that the Sultan caused the book to be translated, and of the translation ABUL FAZIL has given an abridgement. This informs us, that when

* Asiatick Researches, I, 160—166.  † Ayen Akbery, II, 178.
Cashmere was freed from an inundation, by which it had been covered, a certain Kushiup brought the Brahmins to inhabit the new land; that after a long time a general assembly of the inhabitants was called, who elected a man celebrated for his virtue to be their king; and that from thenceforward monarchy was established in that delightful region. The name of the first successor to this king, that is mentioned, is Owngund, who was contemporary with Kishen. From Owngund to Kotadevy, the last native ruler, this history reckons 159 princes; and Kotadevy was succeeded by a Mahommedan prince Shumsheeddæen in the year of the Hegira 742, or of our vulgar æra 1342. The history makes these 159 princes to have reigned an astonishing length of time: but we have no number of years assigned for the reign of any of the first fifty-three princes, nay, eighteen only of them are at all named: of the next fifty-three princes, we find one reigning 300 years, and the others on the whole an incredible length of time. In such a case the safest rule is to take the last three dynasties as a guide, and these give us fifty-two princes in 504 years and some months, which is not quite ten years to a reign, and that is as much as ought to be admitted among eastern dynasties, where oppression always paves the way for revolt, where the line of succession is not clearly defined, and where an old uncle in most cases supplants the infant nephew. On this supposition of ten years for a reign, Owngund and Kishen will be placed in the year before Mahommed 870, or before Christ 248. Now the Brahmins taken to Cashmere by Kushur could not be the Brahmen sect of priests, as they cultivated the earth, and were the only inhabitants of the country: but they must have been one of the Brahmaan nations, several of whom, according to Pliny, were dispersed over India*; and these again, I conjecture, are the same with the Biamma of the Râhâns, supposed

* Page 252 of this volume.
posed by them to have been the first inhabitants of the earth*. That this must be the meaning of the history of Cashmere, seems plain: as we are told, Rajah Jenneh the forty-fifth prince, and who, according to my theory, must have lived about the year of Christ 202, "established in his reign the Brahmeny rites." His successor Jelowk, the most powerful of the princes of Cashmere, "tolerated the doctrine of Bowdh:" and in that delightful valley it was not till the reign of Nereh, the fifty-ninth prince, A.D. 342, "that the Brahmens got the better of the followers of Bowdh, and burned down their temples."

To such as have an opportunity, I would beg to recommend an enquiry into the religion of Nepal. In the account given of that country by father Giuseppe†, it is stated, that there are in it two religions. The most ancient, professed by a sect who call themselves Barjesu, and who, from several circumstances mentioned by the father, seem to be worshippers of Bouddha. The other religion, now the more common, is that of the Brahmens of Hindustan.

"In Narhoara, the residence of the king of kings, "or of Guzerat, even after the Mahommedan invasion in the eleventh century of our era, we find it "mentioned in Edrisi, that the people continued "to worship Bodda‡."

If the conjectures of Sir William Jones, relative to the inscriptions found at Mongher, and on the pillar at Buddal||, be well founded, then the governing power on the banks of the Ganges, as late as about the time of the birth of Christ, was of the sect of Bouddha. The Brahmens indeed had then introduced themselves into Hindustan, and had obtained lands, and even the rank of prime minister to the great Rajah: but they had not persuaded him to change his religion; a change which when accom-

* Page 248 of this volume. † Asiatick Researches, II, 309.
plished, proved equally destructive to the prince, and to the people. However idle and ridiculous the legends and notions of the worshippers of Bouddha may be, they have been in a great measure adopted by the Brahmens, but with all their defects monstrously aggravated; rajahs and heroes are converted into gods, and impossibilities are heaped on improbabilities. No useful science have the Brahmens diffused among their followers; history they have totally abolished; morality they have depressed to the utmost; and the dignity and power of the altar they have erected on the ruins of the state, and the rights of the subject. Even the laws attributed to Menu, which, under the form in use among the Burmas, are not ill suited for the purpose of an absolute monarchy, under the hands of the Brahmens have become the most abominable, and degrading system of oppression, ever invented by the craft of designing men.

During my short stay in the Burma empire, aware of the interesting nature of the enquiry, I neglected no opportunity of making myself acquainted with the religious tenets of the Rāhāns: but from a want of knowledge in the language I should have obtained a very superficial view, had not Captain Symes given me the use of three treatises, which he procured from Vincentius Sangermano, an Italian priest residing at Rangoun. The first was a Cosmography extracted by Sangermans from various Burma writings. The second was a translation of a small treatise, written by a late Zarado or king's confessor, with an intention of converting the Christians. The third was a translation of the book of ordination. These three I have united into one connected account, translating them from the original Latin, and intermixing them throughout with such observations as my personal acquaintance with the subject, and my reading, have enabled me to collect. I regret exceedingly, that in my present situation I am not enabled to make the last more numerous, as I have hardly
hardly any access to books: and I have to solicit the indulgence of the learned for errors, which may have happened in several of my quotations, as I have been sometimes obliged to rely on my memory.

I BEGIN with a translation of the

**COSMOGRAPHIA BARMANA.**

"Of the measures of magnitude, and time, commonly used in the writings of the Burmas.

"I. The Burmas conceive, that there are five species of atoms. The first is a fluid invisible to men; but visible to those superior beings called Nat: a fluid which pervades and penetrates all bodies. The second species of atoms are those very minute particles, which are seen floating in the air, when through any opening the sunbeams enter a chamber. The third species is that very subtile dust, which during the dry season, especially in the months of February and March, is raised aloft by the feet of man or of cattle, or by the wheels of wagons. The fourth species consists of the grosser particles of the same dust, which on account of their weight do not fly through the air, but remain near the earth. The last and fifth species of atoms are those particles which fall to the ground, when letters are written with an iron style on palmira leaves: the manner of writing in use among these people. Now thirty-six of the first species of atoms make one of the second, thirty-six of the second one of the third, and so forth. Seven of the fifth or last species are equal in size to a louse of the human head, seven lice are equal to one grain of rice, seven grains of rice are equal to one inch, twelve inches to one palm, two palms to one cubit, seven cubits to one ta, twenty ta to one usuba, eight usaba to one gaunt, four gaunt to one juzana. The juzana contains six Burma leagues, and four ratoen. The L 4 four
"four ratoen are equal to 400 ta, or 2,800 cubits*. "Again, the Burma writings reckon twelve hairs "equal to one grain of rice, four grains of rice equal "to one finger, twelve fingers equal to one foot, "and the common stature of a man is seven feet or "four cubits."

These measures, it is to be observed, are not in use among the Burmas: but have been introduced from India along with their books.

"II. The time in which the forefinger, when "drawn back from the thumb, will recover its pro-"per position, is called charasi, which may be "translated a second: ten charasi make one pian, "six pian one bizana, or minute, sixty bizana one "hour; sixty hours one day, thirty days one month, "twelve months one year."

Such is the account of the Burma measurement of time given by the missionary: but it is by no means complete. More accurate divisions have taken place, in a great measure, I apprehend, owing to the introduction of the Brahmens. The Rāhāns or priests of Godama being entirely prohibited from the study of astrology, and the people being much addicted to divination of all kinds, the Brahmens have taken advantage of their credulity, and all over India beyond the Ganges have established themselves in considerable numbers. We are not however to conceive, that they have any concern in the religion of these countries: they are merely employed about the courts, and in the houses of the great, as the Chaldeans were about the kings of Persia, as sooth-"sayers and wise men. These Brahmens yearly com-

* The Burma league is 7,000 cubits: accordingly the juzana con-"tains 44,800 cubits, or is nearly twelve miles. The yojana of Hind-"ustan, according to Sir William Jones (Asiatick Researches, IV, 157) is four and a half G. miles. According to Mr. Chambers (Asiatick Researches, I, 155) it is from nine to twelve miles.
pose almanacs, of which I brought several from Amarapura. Before an audience is given on solemn occasions, they perform incantations under the throne of the king, or of great men: they are consulted on all matters of importance, to determine the fortunate hour or season in which these ought to be undertaken: they bestow on their protectors, amulets, charms, and the like. By such means the Brahmins have rendered themselves of great importance in the Burma empire, and have procured many privileges, confirmed even by the written law of the kingdom. Their being mentioned in the Damathat, or code of laws commonly attributed to Menu, by no means however appears to me a clear proof that the Brahmins were introduced into the Burma kingdom as early as that code: for we are told in the preface, that although all the laws are commonly attributed to Menu, yet that many alterations and additions have been made by different princes according to the exigencies of the times. For this and other reasons I am inclined to think that the introduction of the Brahmins into the Burma kingdom is a very recent event. I spoke with none of them who had not himself come from Cussay or Arakan, or who was not the first in descent from such as had come from those countries: and they all either were, or affected to be, very ignorant of the country. Besides, these laws of Menu were introduced from Ceylon, a country of which the indigenous inhabitants never have adopted the religion of the Brahmins.

The Burmas, in whatever manner they may have obtained it, have the knowledge of a solar year, consisting of 365 days, and commencing on the 18th of April. Like most nations they also use a week of seven days, named after the planets. Sunday Ta-nayn-ga-nue, Monday Ta-nayn-la, Tuesday Ayn-ga, Wednesday Boud-dha-ha, Thursday Thua-sa-ba-day, Friday Thouk-kia, Saturday Tha-na.
The common year, however, of the Burmas is lunar; and by this year are regulated their holidays and festivals. It is composed of twelve months, which alternately consist of thirty and twenty-nine days, as follows:

Of 30 days. 1 Ta-goo. 5 Na-miawng. 7 Wa-goun. 9 Sa-teen-giut. 11 Ta-bu-dua.
Of 29 days. 2 Karsoon. 4 Wa-goo. 6 Ta-da-day. 8 Ta-zaung-mo. 10 Pya-za. 12 Ta-boun.

This being eleven days shorter than their solar year, in order to make the beginning of Ta-goo coincide with our 18th of April, the first day of their solar year, the Burmas every third year add an intercalary moon. This seems to have been the extent of chronological science in Hindustan, during the prevalence of the doctrine of Bouddha, as the Rahans will go no farther. But it was soon discovered by the Brahmens, that this contrivance would not make the commencements of the lunar and solar years coincide. They therefore wish from time to time to introduce other intercalary moons, in order to make the festivals occur at the proper season. The present king, who is said to be a studious and intelligent prince, was convinced of the propriety of the Brahmens advice, and persuaded the Rahans of the capital to add an intercalary moon during the year we were there. He had not however the same success in the more distant provinces; for although very strong measures were taken at Rangoun, such as ordering the people for some days not to supply the Rahans with provisions, yet in the end the obstinacy of the clergy prevailed, and they celebrated a great festival a month earlier at Rangoun, than was done at Amarapura. To this obstinacy the Rahans were probably in a great measure instigated by a jealousy, which they not without reason entertain against such dangerous intruders as the Brahmens; and they were encouraged to persist by the ignorance of those about the king. Of this ignorance his majesty was very sensible, and was extremely desirous of procuring from Bengal some learned Brahmens and proper books. None of those I saw
I saw in the empire could read Sanscrit, and all their books were in the common dialect of Bengal.

The 1st of October 1795, was at Amarapura Kiasabada the 19th of Sadeengiut, in the year of the Burma æra 1157; so that the reckoning, at that place at least, agreed very well with the solar year: but I observed that the Burmas in general, if not always, antedated by one day the four phases of the moon, which are their common holidays. I did not however learn, whether this proceeded from their being unable to ascertain the true time of the change of the moon, or if it was only an occasional circumstance, arising from some farther contrivance used to bring the solar and lunar years to coincide. In the common reckoning of time the Burmas divide the moon into two parts, the light and the dark moon: the first containing the days during which the moon is on the increase, and the second, those in which she is in the wane. Thus for instance, the 14th of Sadeengiut is called the 14th of the light moon Sadeengiut: but the 16th is called the 1st of the dark moon Sadeengiut.

Whence the Burmas date their æra I could not from them learn. Joannes Moses, Akunwun or collector of the land tax for the province of Pegu, the most intelligent man with whom we conversed, did not seem to know. He said that whenever the king thought the years of the æra too many, he changed it. The fact however, I believe, is, that this æra commencing in our year 638 is that used by the astronomers of Siam, and from them, as a more polished nation, it has passed to the Burmas, whose pride hindered them from acknowledging the truth.

Having mentioned the fondness of these people for divination, I think no place will suit better than this, to introduce what I observed among them on that

* Loubere du Royaume de Siam II. 102*
that subject; for they consider it as the most useful and noble of sciences. We are not however to believe, that it is always used from ignorance. I am persuaded, that, like the augurs among the Romans, the Brahmens are often called upon for political purposes. When pressed to dispatch business, which the government wish to defer, the easiest way of procuring delay is for the Brahmen to mention a distant day as the favourable time: or when insulted by a nation of whom they are afraid, the minds of the people can easily be quieted, by a distant time being found propitious for revenge. Although I am convinced that political advantage is thus taken of the art, yet there can be no doubt, but that the greater part, even of the best informed among the people, are firmly persuaded of its existence.

No person will commence the building of a house, a journey, or the most trifling undertaking, without consulting some man of skill to find a fortunate day or hour. *Friday* is a most unlucky day, on which no business must be commenced. I saw several men of some rank, who had got from the king small boxes of *theriac*, or of something like it, and which they pretended would render them invulnerable. I was often asked for medicines, that would render the body impenetrable to a sword or musket ball, and on answering that I knew of none such, my medical skill was held in very low estimation. Indeed every Burma doctor has at the end of his book some charms, and what are called magical squares of figures, which he copies, and gives to be worn by his patients. And although these squares are all of uneven numbers, and consequently of the easiest construction, yet the ignorant multitude repose great confidence in their virtue. Some men whom we saw, had small bits of gold or jewels introduced under the skin of their arms, in order to render themselves invulnerable: and the tattooing on the legs and thighs of the Burma men they not only think ornamental, but a preservative against the bite of snakes. Almost every man of any
any education pretends to a skill in cheiromancy, or the foretelling of a person's fortune by looking at the palms of his hands. Prophecies and dreams are also in great credit among the Burmas, as among all rude and ignorant nations. We were informed that a prophecy having lately been current, foretelling that Pegu would again be the seat of government, the king was thrown into considerable anxiety, and thinking to elude the prophecy, had sent orders to the Myoowun (or governor of the province) of Haynthawade, to remove the seat of his government from Rangoun to Pegu then in ruins. The late Myoowun was so attached to Rangoun, that he always found some excuse for delaying the execution of the order: but while we were in the Burma empire, his successor was busily employed in rebuilding Pegu, and having made considerable progress, had taken up his residence in that city. Nor did he appear to be more exempt from such credulity than his master. We were told, when at Pegu, that he was often employed in search of a hidden treasure, in consequence of some directions he had received in a dream: and that he often went into the woods to look for a temple, which, it was alleged, had the power of rendering itself visible or invisible. All good people are in consternation on account of certain robbers, who by a power in magic are supposed able to change themselves into tigers, or other wild beasts, and thus without a danger of detection can commit their nocturnal spoils. The grand art of astrology, however, seems to be chiefly practised, and understood by the Brahmens. Yet, while at Arammattana or Pougan, I procured a treatise on this subject written in the Burma language: which, with all the other manuscripts I brought from the country, are now in the possession of Sir John Murray, at whose request I made the collection. However great the proficiency of the Brahmens in astrology may be, I was informed by my friend the Missionary, that they were very ignorant in astronomy. Although they sometimes attempt to calculate...
eclipses, yet they pretend not to ascertain either the hour of their commencement, or the extent of the obscuration. That his account was just, I make no doubt; as an eclipse of the moon happened during our stay at Amarpura, which had eluded their science, and which they attempted to discredit. It would indeed appear from a treatise of Mr. Samuel Davis*, that the time of the full moon, and the duration of the eclipse, found by the rules given in the Surya Siddhanta, differ considerably from the truth; and that although the rules given in the Siddhanta Rahasya, and other more modern books, make a nearer approach, yet that they are far from being correct; so that even the Brahmins of Hindustan are not much farther advanced than those of Amarpura, notwithstanding the improvements they have introduced from time to time, perhaps as they were able gradually to procure a little better information from their conquerors, Mohammedans and Christians†.

After this long digression I shall return to the Cosmographia

"OF THE UNIVERSE."

"The Universe is called by the Burmas, Logha, which signifies successive destruction and reproduction: because it is conceived, as we shall afterwards mention, that the Universe, after it has been destroyed either by fire, water, or wind, is again of itself restored to its ancient form. Our earth the Burmas do not, like us, conceive to be spherical: but they suppose it to be a circular plane elevated somewhat in the center: so that the is every where from the center to the circumference

* Asiatick Res. II. 285.
† I have heard it reported, that the Royal Oak has now found its way into some of the oldest Brahmenical treatises on the constellations. The greater part of Bengal manuscripts, owing to the badness of the paper, require to be copied at least once in ten years, as they will, in that climate, preserve no longer; and every copyist, it is to be suspected, adds to old books whatever discoveries he makes, relinquishing his immediate reputation for learning, in order to promote the grand and profitable employment of his sect, the delusion of the multitude.
cumference some declivity. This earth is entirely surrounded by a chain of very lofty mountains called Zeitchiaucala.* From the surface of the sea these hills extend each way, up and down, 82,000 juzana. The diameter of this earth is 1,203,400 juzana; its circumference is three times its diameter; and its thickness 240,000 juzana.

The half of this depth is dust. The remaining and lower half consists of a compact rock, which is named Sila Pathavo. This immense body of dust and rock is supported by a double thickness of water, and that again by twice its thickness of air; below which the Burmas suppose to be a vacuum. Besides this earth of ours, it is imagined that there are of the same form 10,100,000 others, which mutually touch in three points, forming between them a similar number of equilateral spaces, which on account of the sun's rays not reaching them, are filled with water intensely cold. The depth of these 10,100,000 triangular spaces is 84,000 juzana, and each of their sides is 3,000 juzana in length†.

II. In the middle of the most elevated part of our earth, the Burma writings place Mienmo, the largest of all mountains‡. It is elevated above the

* The Brahmens, in place of the mountain Zeitchiaucala, suppose the world to be surrounded by an immense serpent, which they name Ananda or Vasugbi. Paulini a. s. Bartholomæo Musei Borgiani Codices mss: illustrati Rome 1798. page 211.

† This shews the very crude notions of geometry which must have prevailed in Hindustan, when this doctrine was invented.

‡ Mienmo is, I believe, a Burma word, signifying the mountain of vision. It seems to be the same with the Meru Paravada of the Brahmens, which are perhaps Sanscrit or Pali words of the same meaning. The ingenious etymologist Paulinus (Mut. Borg. pag: 281 et seq. et passim ubique), in his description of a figure of the Thibet cosmography, has made wonderful confusion by supposing that the imaginary Meru or Mienmo is the same with the snowy Hemavanita or Himaleb, which actually exists. In fact, the cosmographical table of Thibet will be found a rude attempt to delineate the general cosmography here delivered, except that it represents Mienmo, with the seven surrounding chains of hills, and the intervening Sida, as square; whereas they are by the Rabans described as being circular.
"the surface of the sea 84,000 juzana, and descends "as much below. If we take a large cask, and im-
"merse one half of it under water, with one of the "ends uppermost, we shall have an exact repre-
sentation of the figure, situation, and position of "Mienmo. The diameter of the superior plane sur-
face of this mountain is 48,000 juzana. This im-
mense bulk is supported on three feet, which are "three carbuncles, each 3,000 juzana high, and "which are connected to Sila Pathavy. The "eastern face of Mienmo is silver, the western glass, "the northern gold, and the southern face is pale-
coloured carbuncle. Seven chains of hills, like "so many belts, every where surround the king of "mountains Mienmo: and in the intervals between "these chains are seven rivers called Sida*, because "their white waters are limpid like crystal, and un-
able from their lightness to support even the "smallest feather. The height of these hills, and "the width and depth of these rivers, decrease, as "they are more distant from Mienmo, and that in a "duplicate proportion: thus the first range of hills "which is called Jugando, is in height 84,000 juz-
"zana; and the first great Sida or river, which "runs between Mienmo and Jugando, is of the same "width and depth: the second chain of hills is "42,000 juzana high; and the second Sida of equal "width and depth: and thus the others diminish "in a similar proportion."

"III. Opposite to the four cardinal parts of "Mienmo, are placed in the middle of the ocean, "four great islands, the habitations of men, and of "other animals. The eastern island named Piop-
"parvidea, is shaped like the moon in her quarters, "and is in circumference 21,000 juzana. The "western island, which is like the full moon, is "named Amaragoga, and has a similar circum-
"ference.

* Sida in the dialect of Arakan is applied to the sea, which the Burmian name Pan-lay: but I imagine that sea would be a more pro-
per interpretation of Sida, than the word river used by the missionary.
LITERATURE OF THE BURMAS.

"ference. Unchegru, the northern island, is square, and its circumference is 24,000 juzana. Finally, the southern island, which we inhabit, and which is called Zabudiba, is shaped like a trapezium, and is 30,000 juzana in circumference. These names are taken from certain great trees, which are the sacred insignia of each particular island: thus, because the sacred tree of the southern island is Zabu, the island is named Zabudiba, or the island of the tree Zabu; diba, in the Pali language, signifying island."

"IV. Besides these four large islands, the Burma writings allow 2000 of a smaller size, 500 belonging to each of the larger ones. All these small islands are of the same shape with that on which they depend. Except these, the Burmas admit of nothing but a vast and impassable ocean. They also say, that the four different faces of Mienmo communicate their respective colours, not only to the seas lying opposite to them, but also to the islands and their inhabitants. Thus, because the eastern face of Mienmo is silver, the eastern island and its inhabitants, its trees and rivers, with all the eastern sea as far as mount Zetchiavala, are white like milk. In a similar manner, the glass face on the west side of Mienmo communicates a green colour to the great western island, and to the 500 small islands by which it is surrounded, and also to all that part of the ocean which lies to the west of Mienmo. They speak in a similar manner of the two other parts; the northern and the southern:

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* This tree zabu is entirely the creature of fancy, there being no species of plant so called: but I observed that a kind of respect was paid by the Burmas to the Bū-abē boyn or Ficus religiosa. From the characters with which this name is written it is evident- a Pali or Sanscrit word; and the reverence paid to it has been introduced from Hindustan. It is said that Godama rested himself by leaning on it, at a time when he had been much fatigued. The attention paid to the tree seems therefore chiefly given, from its being considered as a relic of the God; but does not appear to be esteemed of much importance in the religious code, as it is not mentioned in the summary of religious duties, which we shall afterwards detail.
and on this account the great ocean is divided into four seas; the white, the green, the yellow, and the brown.

"V. The Burmas do not suppose the ocean to be every where of the same depth. The sea, lying between each of the large islands and its depending small ones, has little depth, and is so smooth as to be passable with convenience in ships; but the seas interposed between the great islands, and also those which lie on one hand between Micronésia and the great islands, and on the other between them and Zetchiawula, have the enormous depth of 84,000 juzana. In these seas the waves rise to the height of sixty or seventy juzana; in them there are frequent and dreadful whirlpools, capable of swallowing up the largest ships; and monstrous and enormous fishes, 500 nay even a 1000 juzana in length. When these fishes simply move, they cause the water as it were to boil; but when they leap up with their whole bodies, they raise tempests extending from 500 to 800 juzana. These seas are therefore inaccessible to ships. It is related in the Burma writings, that a Kula (European) ship, having ventured to penetrate into them, had been swallowed up: and hence it is concluded, that there can be no communication between the four great islands. The Burmas therefore suppose, that the ships which arrive from Europe, in their kingdom, come from some of the small islands belonging to the great isle Zabudiba: and thence the Europeans are commonly called the inhabitants of the small islands." Although religion and ignorance induced the Burmas, on their first acquaintance with Europeans, to form such mean opinions of them; yet better information has corrected their error, and I always at Amarapura heard Britain mentioned by the name of Pyee-gye, or the great kingdom.

* In the Cosmogonia Indico-Tibetana, given us by Paulinus, we have a rude imitation of a ship passing between Zabudiba and one of its dependent small islands, in order, I suppose, to shew the intervening part of the sea to be navigable. I wonder that the vigilance of the good father did not discover it to be Noah's ark.
OF BEINGS LIVING IN THE UNIVERSE, OF THEIR HAPPINESS AND MISERY, AND OF THE DURATION OF THEIR LIVES.

VI. The Burma writings divide all living beings into three kinds: 1st, Chama, or generating beings; 2d, Rupa, or beings which are material, but do not generate; and 3d, Arupa, or immaterial beings or spirits. These three kinds are again subdivided into thirty-one species, each of which has its proper bon or habitation. The first kind, or the Chama, contains eleven species, bon, or states of existence: seven of which are states of happiness, and four of misery, which last are called Apé. The first state of happy existence contains men: the other six happy states are composed of Nat, or superior beings. The four Apé are infernal states, in which beings are punished for former crimes. The second kind of beings, the Rupa, have sixteen bon or habitations: and four belong to the Arupa, or beings destitute of body.

VII. Before I proceed to give a topographical description of these habitations, with an account of the beings which they contain, it will be necessary to explain some collateral circumstances.

1st. It is well known that the Burma writings admit of transmigration; but the notions contained in them on this subject differ from those commonly received; for it is the usual opinion, that the souls, which animate bodies, after the death of these bodies pass into others: On the contrary, the Burma writings alledge, that in death, whether of man, beast, or of any living being, (for they believe all living beings to possess souls,) the soul perishes with the body, and they alledge, that after this dissolution, out of the same materials another being arises, which, according to the good or bad actions of the former life, becomes either a man or an animal, or a Nat,
or a Rupa, &c. And they further alledge, that "beings are continually revolving in these changes, "for the duration of one or more worlds, until "they have performed such actions as entitle them "to Nieban, the most perfect of all states, con- "sisting in a kind of annihilation, in which beings "are free from change, misery, death, sickness, "or old age."

For a further account of Nieban the reader may consult the treatise of the Zarado afterwards translated. Annihilation used in the text by my friend, and in general by the missionaries, when treating on this subject, is a very inaccurate term. Nieban implies the being exempted from all the miseries incident to humanity, but by no means annihilation. Neither does Nieban imply absorption into the divine essence; a doctrine common I believe to Plato and the Brahmens, and probably borrowed from the Magi. The sect of Godama esteem the opinion of a divine being, who created the universe, to be highly impious. It might be supposed, that this doctrine of transmigration would, among the worshippers of Godama, prevent the belief in ghosts or apparitions of the dead, but I found this not to be the case. The death of some persons belonging to the Chinese embassy, who were lodged near us during our stay at Amarapura, produced great consternation among all the women and children in the neighbourhood; their ghosts being supposed more likely to be restless than those of the natives.

"2dly, The Burma writings do not conceive one world, but an infinite number, one constantly succeeding another; so that when one is de- destroyed, another of the same form and structure arises, according to a certain general law, which they call dammada, and which may be interpreted fate. Which was the first world, and which will be the last, they do not pretend to know: nay they say; that even Godama did not obtain this knowledge."
knowledge. Hence however several of the Burma doctors conclude, that these worlds never had a beginning, and never will have an end: that is to say, that the successive destructions and reproductions of the world, resemble a great wheel, in which we can point out neither beginning nor end."

"VIII. Before we treat of the duration of life attributed to the above-mentioned beings, it will be necessary to give some idea of the wonderful duration which the Burma writings assign to one world. They say that the age of the men inhabiting this southern island has not always been the same with what it is at present, and that it will not continue to be the same: but that it is lengthened or shortened according to the general merit or demerit of mens' actions. The life of the first man, or of the first inhabitants of Zabu-diba, extended to one Assenchii. Now the Assenchii is an infinite number of years, of which to give an idea, the Burma doctors say, that if for three years it should rain incessantly over the whole surface of this earth, which is 1,203,400 juzana in diameter, the number of drops of rain falling in such a space and time, although far exceeding human conception, would only equal the number of years contained in one Assenchii. After these first inhabitants, their children and grandchildren had gradually and successively shorter lives, in proportion as they became less virtuous: and this gradual decrease continued till men came to live ten years only, the duration of the life of men in their greatest state of wickedness. The children of these, considering the cause of their parents short life, and dedicating themselves more to the practice of virtue, became worthy of living twenty years. Afterwards their children and grandchildren, increasing gradually in the performance of good works, had their lives protracted to 30, 40, 80, 100, 1,000, 10,000 years, and finally came to live one Assenchii. Now this successive decrement..."
"decrement in the duration of the life of man from one Assenchii to ten years, followed by an in-
crease from ten years to one Assenchii, must take
place sixty-four times after the reproduction of a
world, before that world will be again destroyed.
In the present world eleven of these changes have
taken place, nor will it be destroyed till it has
passed through fifty-three more changes. The
time in which one of these successive decrements
and augmentations of ages take place, is called
Andrakat; sixty-four Andrakat make one Assen-
chiekat; four Assenchiekat make one Mahakat."

"IX. Let us now consider the happiness and
misery of the different living beings; and the bon
or habitations which they possess. We shall
begin with the happy beings, and first of all with
man, the first happy species of these beings called
"Chama*.

"The diameter of this southern island is 10,000
juzana. If we substract 3,000 juzana of woods
and desarts, and 4,000 of water, which occupy
the surface of this island, there will remain 3,000
juzana, the diameter of the bon or habitation of
men. The duration of the life, which men at
present enjoy, is reckoned somewhat long, when
it extends to eighty years. Amongst us some are
rich, others poor; some learned and of a quick
understanding, others ignorant and stupid; some
are oppressed with grief and cares, others free from
anxiety and fear pass their lives in tranquillity and
happiness; some are low and held in reproach,
others are honoured and raised to the rank of
princes, or of officers; some are deformed, others
are beautiful; and finally, some die soon, while
others enjoy long life. These different conditions
and states among men are bestowed on them by
"Godama, according to the merit or demerit of
the actions performed by them in a former life;
but of this we shall afterwards have occasion to
treat more at length."

* Page 179 of this volume.
Let us now consider the opinions of the Burmas concerning the inhabitants, or men of the other three great islands. The life of the inhabitants of Pioppavideha, and Amaragoga, is not liable, like ours, to increase and diminution; but always lasts for 500 years. The form of their countenances resembles, respectively, that of the islands they inhabit; that of the eastern islanders being like the moon in her quarter, and that of the western round like a full moon. These islanders also differ from us in their stature; those of Pioppavideha being nine cubits high, and those of Amaragoga being six. In their manners, agriculture, commerce, and arts, these islanders resemble us of Zabudiba. Each of the four great islands has its peculiar sacred tree, which being produced at the beginning of the world of its own accord, and by the power of fate, will continue as long as the world itself. The height of these trees is said to be 100 juzana, and the branches extend in a circle on every side to the distance of fifty juzana; so that the whole circuit of each tree is 300 juzana, and the trunk is eighteen juzana in circumference.

The inhabitants of the northern island differ totally from those of the others: for they neither practise agriculture, commerce, nor any other profession. There grows in their island a tree called Padeza-bayn, on which, in place of fruit, hang precious garments of every kind: so that from these trees the inhabitants are supplied with all manner of cloathing. Neither have the inhabitants of Unchegru any need to cultivate the ground; as the same Padeza-bayn produces a certain excellent kind of rice, which has no husk. Some of this rice, when the natives are hungry, they put on a certain kind of stone called Zotrassa, which immediately of itself emits fire, and dresses the rice: and as soon as this is done, the fire dies away. Whilst these people are eating their rice, various meats of the most exquisite flavour, according
According to the particular taste of each person, appear on the leaves and branches of the Padezabayn. This food is of such a nature, substance, and nourishment, that what is prepared for one person, would abundantly serve many: and after being eat, it takes away all sensation of hunger for seven days. When the repast is finished, the remains of their own accord disappear. From such a diet the natives of Unchégrú never suffer any sickness; nor have they any inconvenience from old age, but live for a thousand years happy and tranquil in continual vigour, always in their persons resembling youths of eighteen years.

The manner in which these islanders contract marriage, is remarkable. Women there are not subject to the common sexual infirmities, and bear their children without any pain. When their time comes, they bring forth their children in the streets, and there leave them. The children, though thus forsaken by their parents, do not die: for the passengers put the extremities of their fingers into the mouths of the infants, who from thence suck a most exquisite nectarous liquor, by which they are refreshed and nourished for seven days, in which time they become full grown. No one then knows his own relations; not only for the above-mentioned reason; but also because all the inhabitants of the northern island are of the same form and colour. Whenever therefore a man and woman struck with mutual love wish to contract marriage, they retire under the shade of a certain most agreeable kind of a tree. If they be not nearly related, this tree bends down its branches and leaves, covering them with a delightful bower, where they consummate their marriage: but if they be very nearly related, the tree neither bends down its branches nor leaves: and they then knowing their consanguinity immediately abstain from any farther connection. These islanders are not amorous: for they never perform the conjugal rites more than ten times: many abstain from
from them during their whole lives; and many, after having performed them six or seven times, become, as if it were, perfect men and holy, who have overcome all their passions, and all the desires of their minds. For these reasons in this island no one weeps, no one grieves at the death of another: but as soon as a person dies, the body is deposited in a certain place, where very large birds, destined by fate for that purpose, carry it away to another part of the island, and there devour it. Although these islanders are thirteen cubits high, they are very handsome, especially the women, who excel in softness, suppleness, and elegance of limbs. They are of a golden colour, of which, as we have said, the whole island participates, from its being opposite to the golden side of Mienmo.

This northern island, besides, is of all others the most agreeable. In it there is neither hot, nor cold, nor rainy season, nor is there any intemperance in the air. It contains no ferocious beasts, no serpents, nor poisonous insects, that infest the life of man. Its happy inhabitants require no houses, but live their whole lives safe and tranquil in the open air. Every where it abounds with the most beautiful trees, of a golden colour, from whence hang, in profusion and variety, the most delicious fruits, and the sweetest scented flowers. The same trees pour forth most shining gums, which serve the natives for perfumed ointments. The whole island flows with streams of sandal-wood water, in which the natives sport and swim. But although these northern islanders thus excel the others in happiness; they are inferior to those of the south in courtesy, prudence, and cunning.” Cunning among all the worshippers of Bouddha is esteemed a great virtue; and I much suspect, from the practise, that the doctrine of the simple Pandits, as Sir W. Jones is pleased to call them, has not in this point tended to improve the morals of their Hindu converts.

"XII.
XII. The northern, eastern, and western islanders, after death, do not pass into the superior habitations of the Nat, nor into the inferior of the Apé or damned, as do the inhabitants of our southern island Zabudiba; but are constantly born anew, inhabitants of the same island to which they formerly belonged. And although this in some respects be desirable, especially to the inhabitants of the northern island; yet, whoever is endowed with reason and judgment, say the Burma doctors, would not wish to become an inhabitant of the northern, in preference to the southern island: for it is in this last only that a person, by the merit of his good actions, can raise himself to the superior habitations of the Nat, or to that most perfect of all states called Nieban. Hence it is that, in the Burma scriptures, this southern island is called the Ford of Nieban."

XIII. After mankind, come the six ranks of Nat or genii, and their habitations, which are called:—1. Zadumaharit, 2. Tavateinza, 3. Jama, 4. Dussida, 5. Neinmanarati, 6. Paraneimmata-vassanti; besides these there are the Rupa and Arupa. The bon or habitations of the Nat are thus disposed; in the plane commencing at the summit of Jugando, and thus extending from the middle of Mienmo to the mountains Zetchiavala which surround this earth, is the habitation of the first rank of Nat, called Zadumaharit. To this rank belong the sun, moon, planets, and stars, which, according to the Burma writings, are the palaces of certain Nat called Zadumaharit. Beginning at the summit of Mienmo, and extending from thence in a plane to Zetchiavala, is the habitation of the second rank of Nat called Tavateinza. Forty-two thousand juzana above the Tavateinza, is the habitation of the Jama: and above that, always at the same distance of 42,000 juzana from each other, are the habitations of the other three

* The Brahmens, into these six abodes of the Nat, have introduced their Gods with their families. See Paulini Mus. Borg. page 233.
three ranks of Nat. All these habitations are parallel planes extending to the perpendicular of Zetchiauwala. Above the bos of the Nat are those of the sixteen Rupa, which are thus disposed:—five hundred and fifty-eight thousand juzana above the highest habitation of the Nat, are three habitations of Rupa, lying in the same plane, in the form of an equilateral triangle; each habitation being distant from the others 558,000 juzana: the Rupa, that dwell here, are called the first Zian. At the same perpendicular distance of 558,000 juzana, are three other habitations of Rupa, in the same form and disposition; and the Rupa which occupy them, are called the second Zian. In a like manner, 558,000 juzana above these, lie three other habitations, whose inhabitants are called the third Zian. Above these also 558,000 juzana, lie, in the same plane, the two bon of the fourth Zian. The other five bon of the Rupa, are placed one above another, at the mutual distance of 558,000 juzana. And also, one above the other, and at the same distance, are disposed the four habitations of Arupa, or incorporeal beings. Such is the distance from the highest dwellings of these Arupa to this our earth, say the Burna doctors, that a rock thrown from it would take four years to reach the ground: but I doubt, says the missionary, if this be conformable to our observations on accelerated motion."

"XIV. Let us next relate the happiness, and length of life, of the first kind of Nat called Za-dumaharit. The government of this habitation is divided among four kings, or princes of the genii: The capital city of the first is situated to the east of Mienmo, on the summit of Jugando. It extends; in length and breadth, 1,000 juzana. When we speak of the capital of the Nat Tavateinza, we shall have an opportunity of describing the gates; ways, and other things belonging to this superb city; as they are the same in both. The palace of this king extends twenty-five juzana in every di-
"rectification, and all its pillars, walls, and beams, are of silver. The capital of the second king of these *Nat is to the north of Mienmo; that of the third to the west; and that of the fourth to the south. All these cities have the same shape and size with the first. In the whole of this habitation grows the *Padeza-bayn*, on which, in place of fruit, hang precious garments, the most exquisite viands, and whatever can afford delight to the Nat, either in ornament or in feasting. Every where in it are to be seen running streams, lakes, and the most pleasant gardens. On the whole, this habitation is filled with delights. These Nat live 500 of their years, which are equal to 9,000,000 of ours; their stature is half a *juzana*. In this habitation, as well as in those of the superior Nat, are males and females, who perform matrimonial duties in the same manner as mankind; and here it is to be observed, that the beings of the superior habitations are not nourished at the breasts of their mothers, as happens on earth, but are born perfect, as if they were fifteen years old. The Nat of this habitation have subject to them certain genii of an inferior rank, but also called *Nat*. These are giants, great birds, evil genii, dragons, and the like, which inhabit on the descent of *Mount Jagando*. In this habitation also grows a great sacred tree, which, like those on the four great islands of the earth, will last as long as the world."

"XV. We have said, that to the habitation *Zaddumaharit* belong the sun, moon, and stars, which are the palaces of those Nat destined by fate to give light to men, to divide the day from night, to distinguish years, seasons, and months, and to presage good or ill fortune to mankind. This therefore is the proper place to speak of Burma astronomy. The Burma writings mention eight planets, namely, the Sun, the Moon, Mercury, Venus, Mars, Jupiter, Saturn, and another one...

* Page 183 of this volume.
† Sed in coitu non semen, sed solum aëra vel ventum emittunt.
one named *Rahu*, which is invisible *. The Sun, or palace of the *Nat* so called, is fifty *juzana* in diameter. This palace is within gold, and without crystal; and because gold and crystal are by nature hot, the rays of the sun always occasion heat. The Moon is the palace of the *Nat* so called, and is forty-nine *juzana* in diameter. Without, it is silver, and within carbuncle; and because silver and carbuncle are by nature cold, therefore the rays of the Moon are cold. Mars has a diameter of twelve *juzana*, Mercury of fifteen, Jupiter of seventeen, Venus of nineteen, and Saturn of thirteen; and their circumferences are triple their respective diameter †. The Burmas do not assign any measure to the fixed stars. They do not suppose, that the sun, moon, and stars, revolve round the earth; but that they revolve round the great mountain *Mienmo* in a circle, the plane of which is parallel to the earth. The stars they suppose are constant in their motion, neither declining to the north, or south: but the sun, moon, and other planets, they conceive, as we do, to have a declination; and say that the sun goes from the north to the south, and on the contrary from the south to the north, always touching the twelve constellations, which we call the twelve signs of the Zodiac: and they allow, that, in the space of one year, the sun returns to the same place in the heavens from whence he had set out. This same revolution, which by the sun is performed in one year, is by the moon performed in one month. The Burmas did vide

* An admirer of oriental literature would here discover the Georgium sidus, and strip the industrious Herschel of his recent honours.
† From this we might infer that the Burmas, or ancient Hindus, had made such a progress in geometry, as to know that the circumference of a circle is to its diameter as three to one. But if we examine more accurately, we shall find their notions in this science quite absurd, (p. 175). Thus the diameter of the island *Zabudiba* is made 10,000 *juzana*: but they suppose, that three spaces, whose diameters are 4,000, 3,000, and 3,000; should be equal to the whole extent of the island, (p. 182). And they even suppose the circumference of *Unthegru*, which is a square, to be only three times its diameter.
On the Religion and "vide the year into three seasons, the hot, the "rainy, and the cold: and in order to distinguish "these seasons, although they believe the sun and "moon decline by a daily motion, yet they suppose "three roads in heaven; a road within, a road in the "middle, and a road without. The inner road is "nearest Mienmo; and when the sun enters it, the "rainy season commences; when he enters the "middle road, the hot season commences; and when "he enters the outer road, the cold begins. By "these three roads, which are distant from each "other 39,093 juzana, that immense space, which "lies between Mienmo and Zetchiavala, is divided "into four great zones. The inner road corresponds "to our summer solstice, the middle to our equi-"nox, and the outer to our winter solstice; or, to "speak more accurately, the middle road is the "Equator, the inner the tropic of Cancer, and the "outer the tropic of Capricorn. Besides these three "roads of the sun, the Burma writings maintain, "that there are three paths, one above the other; "by which means they admit, as well as we do, "although in a different manner, that the sun at "some times is more near the earth, and at others "more remote. The highest of these paths, and "the most remote from us, is the path of the ele-"phant; the middle is the path of the ox: the "lowest is the path of the goat, because that animal "delights in dry and warm places: when therefore "the sun is in the goat's path, it produces great "heat and dryness in the earth. Thus also, when "the sun is in the higher path, we experience heavy "rain, and great cold; this path is therefore named "after the elephant, an animal that frequents cool "and moist places. It is not supposed that the sun "revolves through these paths according to any "general law: but his motion in them depends on "the will of mankind. When man acts with recti-"tude, and observes the laws, the sun moves in the "middle path, which is highly salutary: but when "he violates the laws, the sun moves either in the upper
upper or lower path, with much injury both to the produce of the earth, and the health of the people. The sun's motion is quicker than that of the moon; for when he moves in the road next Mienmo, he advances daily \(1,000,000\) juzana; when in the middle road, \(2,000,000\); and when in the outer, \(3,000,000\) juzana. On account of this diurnal revolution of the sun, when in the southern island Zabudiba it is mid-day, then in the northern it is mid-night, in the eastern island the sun sets, and in the western it rises.

"Although the sun, moon, and stars, appear to our eyes round, yet, say the Burmas, we are by no means to believe them spheres: for they are tapering, and appear round to us, in the same manner as does the light of a candle when viewed from a distance; and this the Burma doctors think confirmed by an example related in their books:—Formerly a prince of the Nat desired to see and converse with a certain great king of this island Zabudiba, who by his many virtues had become highly celebrated. For this purpose the prince sent his chariot, with many Nat attendants, to conduct the king to his presence. The chariot appeared to mankind in the beginning of the evening along with the moon then rising in the horizon, and was supposed by every one to be another moon, till it came near to the palace of the king.

"XVI. Before we finish our account of the Burma astronomy, some other circumstances, relating to this science, and to meteorology, may be mentioned.

"It has been already stated, that the Burma writings admit of an eighth planet, named Rahu, which gives no light, and on this account is not visible to mankind. The form of Rahu is thus described. His stature is \(48,000\) juzana: the breadth of his breast \(12,000\), of his head \(900\), of his forehead, his nostrils and mouth \(300\), the thickness of his fingers \(50\) juzana; of his feet and
hands 200. When this monstrous and foul planet, who like the others is a Nat, is inflamed with envy at the brightness of the sun or moon, he descends into their path, and devours, or rather takes them into his mouth: but he is soon obliged to spit them out, for if he retained them long, they would burst his head by the constant tendency which they have to pursue their course. At other times he covers them with his chin, or licks them with his immense tongue. In this manner the Burma writings explain eclipses of the sun and moon, both total and partial, making the duration of the eclipse depend on the time that Rahu retains the planet in his mouth, or under his chin. The Rāhāns say, that every three years Rahu attacks the sun, and every half year the moon. These eclipses however are not always visible to the inhabitants of this southern island; but although they may be invisible here, they are not so to the inhabitants of the other islands, according as the sun and moon may be opposite to them at the time of the eclipse.

The physical cause of the phases of the moon, assigned in the Burma writings, is this: When the moon is in conjunction, she can give no light, because the sun is perpendicularly over her: in the same manner as a house at noon gives no shadow*: but as the moon recedes daily from the sun 100,000 juzana, that part of it which is freed from the disk of the sun, gives light; and this light increases daily, as the two luminaries get at a greater distance; in the same manner as a house produces a larger and larger shadow, in proportion as the sun advances to the west.

Relative to the heat and cold which we experience at different seasons of the year, the Burmas say, that from the vernal equinox to autumn, the sun is always tending to the north, whilst at the same time the moon

* The Burma doctors say so, as living within the tropic.
inclines to the south. The season is then hot, be-
cause of the prevalence of the sun's rays, which are
by nature hot. On the contrary, from the autum-
nal equinox to the vernal, the sun inclining to the
south, and the moon to the north, we experience
cold, from the predominancy of the moon's rays,
which are by nature cold.

For the production of rain, seven causes are
chiefly assigned; part of which are physical, and
part moral. 1st, The power Naga, or of serpents,
a kind of Nat*. 2d, The power Galoun, or of
certain large birds, which also are a kind of Nat†.
3d, The power Siffa, or fidelity in contracts and
promises. 4th, The power Sila, or obedience to
the law. 5th, The power of religious men‡. 6th,
The condensation of the clouds. 7th, A certain
kind of Nat, who preside over showers, and who
occasion rain, whenever they go out from their
houses to sport in the air. In some of the Burma
writings it is said, that when the sun is in the path
of the goat, these Nat do not chuse to leave their
houses on account of the great heat, whence there
is then no rain. For this reason, the inhabitants of
the Burma empire, in times of drought, are wont
to assemble in great numbers, with drums and a
long cable. Dividing themselves into two parties,
with a vast shouting and noise, they drag the cable
contrary ways, the one party endeavouring to get
the better of the other: and they think, by this

O
means,

* Page 188 of this Volume. † Ibid. ‡ A certain Burma king, who
resided at Arammattana or Pougan, is said to have been so virtuous, that he
could cause rain whenever he pleased: and that in such quantities, as to
enable him to transport his fleet wherever his occasions required. This story
was greatly told us at that city, and was said to be authenticated in the best
histories of the Arammattana race of princes. This same king was such a
favourite with Godama, that twice during his reign gold fell from the
heavens, and covered all the fertile plain of Pougan. From the immense
number of temples and religious buildings on that plain, there is no doubt,
but that some king of Arammattana must have been very superstitious: and
we may suppose, that the history of his reign was written by the clergy,
who seldom fail to give a good report of their benefactors.
means, to invite the Nat to come out from their houses, and to sport in the air. The thunder and lightning, which frequently precede rain, are the clashing and shining of the arms of these Nat, who sometimes sport in mock-battles. As the Burma writings acknowledge Nat presiding over rain, so they also (like the ancient heathen) believe in others governing the winds and the clouds.

So far the missionary, on the astronomical and physical ideas of the Burma doctors; ideas which, I doubt not, were brought from Hindustan, along with their religion and laws. Such therefore, probably, was the astronomical doctrine, taught in that country, before the introduction of Brahmenical science, which by all accounts, however deeply involved in fable, is much more perfect. I do not conceive it to have been the invention of Godama, or of those who in his name propagated a new religion, but to have been the common doctrine prevailing in Hindustan at the time: for the Rāhāns seem to confine their studies almost entirely to theological, historical, moral, and political subjects. From the use of the same signs of the zodiac, there can be little doubt of their having derived at least that part of their astronomical knowledge from the Chaldeans; whose science may have in some degree reached India, nearly about the time of Godama, through the conquest of the Persians under Darius. But I do not think it likely, that all the knowledge which the Hindus possessed in the time of Bouddha, was derived from Babylon.* It is true, that the Persians shortly previous to this, as we learn from our best guide Herodotus, were an extremely rude and ignorant nation:† and we have very probable grounds given us by Sir William Jones for believing that the Persians proper were of the same nation with the Hindus. It might therefore be concluded,

* See page of this volume. † I speak of the Persians properly so called, the inhabitants of Parsīstan, who under Cyrus founded the first great Persian monarchy.
cluded, that in the sixth century before the birth of Christ, the whole Hindu race were equally ignorant with their Persian brethren. Such reasoning would, however, I conceive, be inconclusive. Why might not the Hindus of Matura or Cashmere be as much superior to their countrymen of Persia, as the Arabs of Nineveh or of Babylon were to the wanderers of the desert? But even allowing the Hindus to have been incapable of inventing science, might they not have received instruction from the east, as well as from the west? Their eastern neighbours, at this time, had made very considerable progress; such, indeed, as enabled them, about this period, to produce a Confucius. But that the Hindus were themselves capable of observation, so as to make advances in science, their undoubted invention of cyphers, in arithmetic, is a clear proof.

During our stay at Amarapura, besides the almanacs, which were probably constructed by Brahmins, I also saw several treatises, said to be on astronomical subjects. Johannes Moses, Akunwun of Haynthawade, gave Captain Symes a delineation of the sixty-eight Burma constellations, with a short explanation in the Burma language. I have here given a copy of the delineations, and a translation of the written part, which, for the benefit of those who wish to know the structure of the language, I have made verbal, following exactly the arrangement of the words in the original. In explaining these constellations, it is to be observed, that to each a fanciful figure is annexed, in the same manner as our constellations are delineated on globes or maps. This figure is called the Thadan, or picture of the constellation; and the name of the object represented by the picture, is often the same with that of the constellation: but, more commonly, the names are quite distinct, and that applied to the constellation is either arbitrary, or a Pali word, with which language my interpreter was not acquainted. In the written account, there is, in some cases, a difference
rence from the drawings, both in the figure, and in the number of stars: but I have, in both cases, followed the originals, not knowing which is right. Some of the figures, resembling a rose, seem to represent planets, and are said to preside over some day of the week, or some time of the day. To the other figures are in general annexed certain cities, or countries: and the Burmas suppose, that, when a constellation appears bright, its dependant country is fruitful and happy: and that the contrary is indicated by the constellation appearing dim. Of many of these countries I have never heard, nor could I obtain any information concerning their situation: but several of them are in the Burma empire, or in its vicinity. Unfortunately, the copy of the Asiatick Researches, which I consulted, had not the figures of the Brahmenical constellations, to which Sir William Jones refers, so that I can make no comparison but by the name.

TRANSLATION OF THE WRITTEN ACCOUNT OF THE BURMA CONstellations.

1. "Of Sunday the Star."
2. "The Pyain constellation five circles has, of "Thoukkada country the constellation." Pyain is the small species of white heron, common in India, and called, by the English there, paddy-bird. The circles means stars, as they are so represented in the delineations, a custom evidently introduced from China. Thoukkada is a government and city in Siam, named by M. Loubere Socotai.
3. "Rewade an alligator's figure has, Kutheinnaroun "country, and nine circles it has." This is evidently the same name with the Révati of Sir William Jones, which has thirty-two stars. Rewade signifies large water. From the letters with which Kutheinnaroun are written, it is evidently a Pali or Sanscrit word, and is probably some place in Bengal.
4. "Uttara-
4. "Uttara-parabaik a cow's figure has, and two circles, and the Kappelawut country." Several constellations in the list of Sir William Jones begin with Uttara.

5. "Pyouppa-parabaik of a cow the picture has, and two circles, Patanago country it governs." Patagano is a city and government in the Burma kingdom, on the east side of the Eyrawade, in latitude 19° 55'.

6. "A couch is Sagata constellation, four circles it has, and the Kathee country." Kathee has been corrupted by us into Cuffay. It is an independent kingdom between Ava and Bengal. Its king resides at Mynnypura.

7. "The Pyathat, of twenty-four circles, is of Kieen country the constellation." Pyathat is a kind of spire, permitted only to be used in buildings or boats dedicated to the personal use of God, of the king, and of the Zardo.

8. "The duck constellation five circles has, Shan is its country." From Shan our word Siam is corrupted; but the inhabitants of the kingdom of Siam make a small part only of those to whom the Burmas give the appellation of Siammese.

9. "The Kyabuayn aroo leaf is the Talain country constellation, it has seven circles." Talain is the Burma name for the original inhabitants of what we call the kingdom of Pegu.

10. "The horse constellation has eleven circles, Europe is its country."

11. "The morning constellation one circle has, of Dunwun plant the fruit." I do not know what plant is meant; perhaps it is the Trapa?

12. "The table constellation four circles has, of the Kiiyn country the constellation." The Kiiyn are a simple innocent people inhabiting the mountains between Ava and Arakan.

13. "Zain constellation eleven circles has."

14. Thattapecsia with a leopard's picture four circles has.

15. "Of
15. "Of Danatheidha the fisherman's picture four circles has.
16. "Tharavun constellation a hermit's picture three circles has."
17. "Of Utiara the lion's picture two circles has, "Moranun country governing."
18. "The Pangiayn mountain constellation four circles has, of Rakain country the constellation. Rakain is the proper name of Arakan.
19. "Tareindane constellation four circles has, of Yoodaya country the constellation. Yoodaya is the Burma pronunciation of the ancient capital of the kingdom of Siam; and they in general call the Siammese Yoodaya, in order to distinguish them from the other tribes of the great Shan race.
20. "A couch is Pagan constellation with four circles, of Shethak country the constellation." We had another couch No. 6.
21. "The cloud constellation has five circles, of Thulabe the constellation."
22. "The Shan country the elephant constellation with six circles has." The Shan have another constellation, see No. 8.
23. "The Brahmen constellation of eight circles, Kaleingareet country governs." Kaleingareet is the proper Burma appellation for Hindustan.
24. "Of Pyouppathan the lion's picture two circles has, Mouttamma country it governs." We had another lion No. 17. Mouttamma is the Burma name for Martaban.
25. "Of Mula the cat's picture five circles has, Peenzalareet is its country."
26. "Of Seitta the goat's picture five circles has, Zedouttara is its country."
27. "Of Anurada the peacock's picture has fifteen circles, and the Zedouttara country." Anuradha, in the account of Sir William Jones, is the scorpion.
28. "The fowl male of Peenza constellation circles fifty has, of Sawa country the constellation.
29. "The
29. "The fowl female of Ulta constellation eight circles has, of Uzaung country the constellation."

30. "Of an alligator the ——— is the picture of Ut-tara constellation with eight circles, and the "Lahu country." Of the word a-me-kah-han, which follows alligator, I do not know the meaning.

31. "The balance constellation."

32. "The crab constellation of ten circles has, Raja-'gyol country."

33. "The mountain constellation four circles has."

34. "Buchia the crab constellation ten circles has." Pusnya is the crab of Sir William Jones. Here we have two crabs, No. 32—34.

35. "The Brahmen's Buchia has a boat's picture, and the Dagoun country." Dagoun is the great temple near Rangoun.

36. "Of Adara Daway is the country." The picture is meant to represent a turtle. Daway is the country we call Tavay.

37. "Mecathe has of an antelope's head the picture, "three circles, and the Haynthawade country." Haynthawade is the polite Burma name for the city and province of Pegu.

38. "Of Friday the Star."

39. "Buchia constellation has eight circles, and Yun "country." The Yun are the inhabitants of Saymmay or Chiamay.

40. "Zaduka constellation four circles has, in a pair "of fetters, of Giun country the constellation." I have never learned what country is meant by Giun. It is always in the king's titles mentioned along with the Yun, it is therefore probably contiguous, and may be the northern Laos.

41. "The crow constellation eleven circles has, and "the Thayndua country." Thayndua is the most southerly government in the present division of the Arakan kingdom.

42. "The Kyay ship of twenty-eight circles."
43. "Hayntha, a constellation of seven circles, belongs to Radanapura." Radanapura is the polite name for old Ava. The Hayntha is that beautiful species of Anas called by the English the Brahminy goose.

44. "Of Rohane the snake's-head figure has ten circles." Rohini of Sir William Jones.

45. "Kiatteka has a fowl's picture, and six circles." Critica of Sir William Jones is the bull. The names appear to be the same.

46. "Pagan country is governed by the old cock's figure." There are two cities called Pagan. The great Pagan on the west side of the junction of the Kyaynduayn and Ayrawade; the leffer Pagan lower down on the east side of the Ayrawade.

47. "Of Athawane the horse's head picture has six circles, and the Rakain country." Aswini, which seems to be the same name, is, according to Sir William Jones, the ram. Arakan has another constellation No. 18.

48. "Pozoke a constellation of eight circles belongs to the Talain country, like the Hayntha male and female." The two rival nations of Pegu and Ava have chosen a similar emblem, see No. 43. The Talain have also another constellation, No. 9.

49. "Putthata constellation seven circles has, of the Raneezee tree the fruit."

50. "Aykatheitta a constellation of four circles, of Kale country the constellation, is like a banana. Kale is a Shan city near the Kyaynduayn, about 300 miles N. E. from Ava.

51. "Taroutlara constellation two circles has, and the Taroup country." This is the Burma name for China.

52. "Of Uttarabaragounne the bullock's picture two circles has."

53. "Of Wednesday the Star."

54. "Of Pyouppabaragounne the cow's picture three circles has."

55. "Matha
55. "Matha has of a monkey the figure, four circles, " and the Baranathe country."
56. "The balance constellation four circles has." We had another balance No. 31.
57. "Of Athaletha the horse's-yard picture, four circles " has, and the Thattoun country." Aslesha, the same name, according to Sir William Jones, is 
the lion. Thattoun was a very large town between Pegu and Martaban. It is now in ruins.
58. "The flag is Pathatta constellation, six circles it " has."
59. Eessa constellation six circles has, of Momain " country the constellation."
60. "Of Akap, a constellation of eight circles, Daway " is the country." This is a second constellation belonging to Tavay, see No. 36.
61. Of Thanlack, a constellation of three circles, " Kothambe is the country." The figure is meant 
to represent a spear's head.
62. "Wethaga has of a buffalo's head the picture, and fourteen circles."
63. "Of Thuade a great snake's-head picture, has " three circles, and the Thayndua country." Swati, 
the same name, is, according to Sir W. Jones, the balance. Thayndua has also another con-
stellation, see No. 41.
64. "Of Zettiara the tiger's picture, has one circle, " and the Wethale country."
65. Hathadda of an elephant's head the picture has, " Dhagnawade is its country." Hafia of Sir 
William Jones. Dhagnawade is the polite name for the castle of Arakan.
66. "Kobiape constellation with eleven circles has " the Myamma country." Myamma is the name 
by which the Burmas distinguish themselves.
67. "A fowl's foot is Thareiddha, a constellation " of four circles, of Laynzayn country the con-
stellation."
"Stellation." Laynzayn is the vulgar name for "the capital of the southern Laos.

68. "A boat's ladder is Tareiddha, a constellation of "six circles, of Kula country the constellation." Kula is the name commonly given to Europeans, but is applicable to all the western nations.

Along with the accounts of the Burma constellations, Johannes Moses gave Captain Symes two circular schemes, which evidently relate chiefly to a lunar zodiac. These schemes Captain Symes obligingly communicated to me, but without any explanation.

The ultimate division in the larger plan is into twenty-seven signs, representing the diurnal motion of the moon in her orbit. I neglected to procure the Burma names for these signs; as I was told, that they were all contained in the delineations of the sixty-eight constellations; and as I thought, from the disposition of the stars, that I should be able to find out what constellations were meant: but since I have had leisure to examine them, I find that this is by no means the case.

The next division, and which is to be seen in the outer circle of both plans, is into nine signs, each containing three of the former. The names for these are: 1, the horse constellation; 2, the Pyain constellation; 3, the crow constellation; 4, the Hayntha constellation; 5, the Kayn crab constellation; 6, the balance constellation; 7, the Zangiayn constellation; 8, Dana constellation; 9, the elephant constellation. These are to be seen in the delineation, and list of the Burma stars, Nos. 10, 2, 41, 43, 34, 56, 61, 15, 22. These
The inner division in both schemes is into four. These are named raung, the meaning of which word I do not know: the first is named Banraung, the second Ngue or silver raung, the third Shue or golden raung, and the fourth Mya-raung. These, I conceive, represent the spaces of the zodiac passed through by the moon in each of her four phases.

This lunar zodiac is also in use among the Brahmens, and Sir William Jones has favoured us with a representation of it after their manner*. They have the divisions into 4, 9, and 27: and the figures in the center are no doubt a representation of Mienmo, and the surrounding islands, with the princes of the Nat Zadumaharit fitting on mount Fugando: in one thing however there is a material difference. Sir W. Jones says, that the nine figures represent the sun, moon, and planets, with the dragon's head or ascending node, and tail or descending node. It is true, that the Burmas believe in a planet, which performs the same effect as the moon does when near her nodes at the time of a conjunction or opposition, that is to say, which produces an eclipse: but the division into nine, in use among the Burmas, is evidently zodiacal. The divisions are not called Kiy, which signifies a planet: but they named Tara, or a collection of fixed stars: and in both the written account, and in the delineation of the sixty-eight constellations, there is an account of the number of stars contained in each. Were we sure that these schemes were mentioned in the writings of the Râhâns, and not lately introduced into the Burma kingdom by the Brahmens, we might easily account for this difference. It would in that case be probable, when, in compliance with the prejudices of their new converts, the Brahmens adopted this lunar zodiac, that seeing no utility in the division into nine, and having a more just notion of the planetary bodies, they filled up the places of these nine constellations with the different parts of the solar system. I make little doubt

* Asiatick Researches, II, 291, et seq.
doubt indeed, but that the Brahmens originally introduced themselves into the courts of the Hindu princes as astrologers, in the same manner as we see them now doing in the courts of the Indian princes beyond the Ganges. By degrees they also introduced their superstition, building it in part on the doctrine previously existing in the country, and at length firmly establishing their favourite and destructive system of cast. In the larger plan, between the four raung and the twenty-seven constellations of the zodiac, we have a division into twelve, which, I should imagine, is meant to represent the sun's motion through the zodiac, during the twelve lunations of which the Burma year consists. At any rate, as has been mentioned before, the Burmas are acquainted with a solar zodiac divided into twelve signs, and represented by figures the same or analogous to ours. My friend Sangermano gave Captain Symes a silver bason on which they were embossed. He conceived, and I think justly, that this zodiac had been communicated to the Burmas from Chaldea by the intervention of the Brahmens. And I find that in this conjecture he is supported by Sir W. Jones*. Both however, I am afraid, will excite the indignation of the Brahmens, who, as the learned judge in another place alleges, have always been too proud to borrow science from any nation ignorant of the Vedas. Of their being so proud as not to acknowledge their obligations, I make no doubt: but that they have borrowed from the Chaldeans, who were ignorant of the Vedas, Sir W. Jones himself has proved. Why then should he have opposed the sarcastic smiles of perplexed pandits to the reasoning of M. Montuclo†, when that learned man alleged that the Brahmens have derived astronomical knowledge from the Greeks and Arabs? The Chaldeans were certainly a branch of the Arab nation: and the expression of the Brahmens quoted by

* Asiatick Researches, II. 306. † Asiatick Researches, II. 303, 289.
by him as proof, namely "that no base creature can
be lower than a Yavan or Greek*," only exposes
their miserable ignorance, and disgusting illiberality.

"XVII. Below the habitation Zadumaharit," says
the millenary copying from the Burma writings,
"are found many Nat who inhabit waters, woods,
and mountains, in the shape of large birds, dragons,
and the like. The Burma writings however by no
means allledge, that these beings enjoy the same hap-
pienes, or the same duration of life, as the Nat
"Zadumaharit. These circumstances vary, accord-
ing to the nature of the actions performed by these
Nat, when in a human form. It is said that the
"king of the dragons saw the first God, who appeared
"in this world†, and that he will see the last; or in
"other words, that the duration of his life will be
"nearly equal to that of the world. It is also said
"of this king of the dragons, that he always sleeps
"at the foot of those mountains, from whence the
"river Caffe springs; and that he only awakes on the
"appearance of a new God. That is, when any
"being has arrived at such a degree of merit, as to
"deserve to be declared a God, he eats rice, which
"has been boiled in a golden goblet; he then, in
"order to give the people a proof of his having ac-
"quired divinity, throws the goblet into the river
"Caffe. The goblet swims up against the stream, till
"it arrives at the place where the king of the dragons
"sleeps. There it strikes against the rock, and makes
"a noise, till the king awakes. There are also a kind
"of Nat, named Bommazo, who live longer than
"those of Zadumaharit."

"XVIII. Above Zadumaharit is the bon or habi-
tation Tavateinza, which, as has been said, is situated
on the plane of Mienmo's summit. The supreme ruler
or emperor of this habitation has subject to him
thirty-two inferior Nat princes. The great city
Mahasudassana,

* Asiatick Researches, II, 306.
† The Burmas believe; that in every world there arise four or five Gods,
one after the other.
"Mahafudassana, in which this emperor resides, has "a square form. The pavement, streets, and ways, "are entirely covered with silver or gold. The gilded "wall, which surrounds the city, is a perfect square. "Each of its sides is in length 10,000 juzana, in "height 150*, and in width one juzana and a half. "The gates are forty juzana high, are covered with "gold and silver, and adorned with precious stones. "Seven ditches, distant one juzana from each other, "surround the walls of the city: and a juzana beyond "the last ditch is a row of marble pillars, gilded and "flanked with jewels. At the farther distance of a "juzana and a half are seven rows of palm trees, loaded "with gems, pearls, gold and silver. Every where "are to be found lakes of the most limpid water, where "are kept gold and silver boats, into which the male "and female Nat entering with their drums and mu-
"sical instruments, and pursuing one another through "these delightful lakes, now dance, then sing; some-
times pluck the odorous flowers from the trees, "which hang over them; and sometimes admire the "beauty of the birds, which frequent the trees and "lakes. Beyond the palms every where grows the "abovementioned Padeza-byan, the trees on which, "in place of fruit, hang the clothing and food of "the Nat."

"Twenty juzana to the north of this city is a "garden named Nanda, 100 juzana in length, and as "much in breadth. In its center is a lake of the "same name, and equally pleasant with those just "now described. In this garden chiefly grows that "celebrated flower, which is as large as a chariot "wheel. The garden is named Nanda, which sig-
"nifies a crowd, because the Nat frequent it in mul-
titudes, in order to pull the flower, and wear it in "their hair.

"To the east of the city, at the distance also of "twenty juzana, is another garden, equally large and "pleasant

* I suspect that either the Latin copyist or I have added here a cypher too much.
pleasant as the former. It is named Zeittalata*; and in it grows that renowned twining plant, which every thousand years produces a most exquisite fruit. In order to get this fruit the Nat assemble here in crowds for a hundred years before it ripens: and for one whole year, sing and dance, accompanied by drums and other musical instruments. Having eat of that fruit, the Nat become inebriated for four entire months. 

To the south and west of this city are also two other gardens of the same size, and ornamented with lakes, and beautiful trees. The garden to the south is named Parasu, that to the west Mijfata. 

To the north-east of Mahafudahana is a very large hall, extending every way 300 juzana. In circumference it is 900 juzana, and in height 450. From its roof hang golden bells: and its stairs, walls, and pillars, every where shine with gold and silver, intermixed with precious stones. The pavement is of crystal, and each row of pillars contain 100 columns. The road, which leads to this hall, is twenty juzana long, and one broad; and from space to space are planted trees abounding with all kinds of fruits and flowers. When the great emperor wants to go to this hall, winds arise, which blow off all the leaves and flowers from the trees, and fresh ones immediately succeed. With these flowers, the Nat presiding over the winds, adorn the whole road to the hall; and the flowers are so abundant, that they reach up to the knees of the passengers. In the middle of this hall stands the great imperial throne, whose plane extends a juzana; and over it is the white umbrella†. No throne 

* Lata, Lot, or Lot, in the language of the Hindus, signifies a climbing plant. 
† Different ranks in the Burma empire are distinguished by their umbrellas. That of the king is white, with a deep fringe adorned with gold lace and plates. Those of the princes of the blood are gilded, and without a fringe. Those of the four great ministers of state, called Wangyes, are of the same shape with the royal one; but are red. Those of the hereditary
shines like this with gold, pearls, and jewels. It is
surrounded by the thirty-two thrones of the in-erior Nat princes, and behind these sit the other
Nat, each in his proper place. In this grand con-
tvention are also present the four chiefs of the Nat
Zadumaharit. At the time in which the Nat thus
crowd round the great emperor to do him honour,
they touch their musical instruments, and sing me-
lodiously. The four Zadumaharit princes then call
the Nat under their jurisdiction, and send them into
this southern island Zabudiba, commanding them
to enquire diligently, if its inhabitants observe the
holy days and laws, and exercise charity; or if, on
the contrary, they violate the laws, and neglect their
duty. At this command, quicker than the winds,
the Nat pass through all the parts of this island;
and having carefully noted, in a golden book, the
good and bad actions of men, they immediately re-
turn to the hall, and deliver their writing into the
hands of the four Zadumaharit princes, who pass it
to the lesser princes Tavateinza, and these forward it;
till at length it reaches the great emperor. He,
opening the book, reads aloud, and his voice, if it
be natural and even, is heard to the distance of
twenty-two juzana: but if it be raised, sounds over
the whole habitation Tavateinza. If the Nat hear
that there are many men who observe the law,
pri\`etise good works, and bestow alms, they ex-
claim, "Oh! now the infernal regions will be
empty, and our abode will be full of inhabitants."
If, on the contrary, there have been found few good
men, "O wretches, (say they smiling,) men and fools,
who feasting for a short life, for a body four cubits
in length, and for a belly not larger than a span,
have heaped on themselves sin, on account of
which they must be miserable in futurity." Then

the

hereditary governors of provinces, or tributary princes, are yellow. Those
of governors of royal provinces, called Myooouns, are blue. Lower
officers have black umbrellas, but supported by very long shafts. People
who have no rank, use black umbrellas with shafts of moderate length.
the great emperor, that he may induce men to live virtuously, charitably, and justly, speaks thus: "Truly, if men fulfilled the law, they would be such as I am." After this he, with all his train, to the number of 36,000,000 of Nat, return to the city, in the midst of music.

In the center of this glorious city is built the palace of the emperor, of which the height is 500 juzana: but who can describe its beauty, ornaments, treasures, or the abundance of gold, silver, gems, and precious stones, with which it shines? Small standards, of gold and silver, are placed in every part.

The chariot in which the great emperor is carried, extends 150 juzana, and in it are placed a great throne, and a white umbrella. This chariot is drawn by 2,000 horses, before whom is the great standard, 150 juzana high, which, when moved by the wind, yields a most agreeable murmur.

Twenty juzana to the north-east of the great city is a most celebrated tree, the sacred image of the habitation, which, like the sacred trees of the four great islands, lives for the duration of one world. Under this tree is a prodigious stone, sixty juzana long, fifty broad, and fifteen high. It is smooth and soft like cotton, and under the feet of the great emperor is elastic, being depressed when he stands on it, and rising again when he descends, as if it were sensible of the honored weight by which it is pressed. When the affairs of our southern island are prosperous and quiet, the half of the emperor's body sinks into the stone: but when a contrary state of affairs exists, the stone remains tense and rigid like a drum. This sacred tree is surrounded by some of the kind called Padeza-bayn, and by others producing both fruit and flowers. The road leading to this tree is twenty juzana long, and is every year frequented by the Nat resorting to the place. When the tree flowers, its ruddy splendour extends, all around, to the distance of fifty juzana, and its most agreeable odour is diffused twice that length. When it has flowered, the

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keeper of the tree informs the emperor, who is immedi- 
ately seized with a desire to see it, and says, if 
an elephant would now appear, it would be both a-
greeable and convenient. No sooner has he spoken, 
than the elephant appears: for here, as well as in all 
the other habitations of the Nat, there are no animals, 
such as in our earth; but whenever any Nat has use 
for an animal, a temporary one is immediately creat-
ed. This elephant has thirty-three heads, corre-
responding to the thirty-three Nat princes. Every head 
has seven teeth, which are fifty juzana in length. In 
every tooth are seven lakes, in every lake seven 
flowering trees, on every tree seven flowers, in every 
flower seven leaves, in every leaf seven thrones, in 
every throne seven chambers, in every chamber seven 
beds, in every bed seven Nat dancing girls. The 
head, on which fits the supreme emperor, is thirty 
juzana in bulk; and is ten times larger than the other 
heads. On the large head is raised a pavilion three 
juzana high, under which is fixed the ruby throne of 
of the emperor. This elephant, called Eravum, ap-
proaches the emperor, and after him the thirty-two 
princes mount. After the elephant the other Nat 
follow, each in his couch of state. Having come to 
the sacred tree to collect the flowers, this vast mul-
titude dismount; and the emperor being seated on 
the stone, the whole sit down, each in his proper place, 
and begin to celebrate the festival, which continues 
for four months. They then gather the flowers, to 
do which they have no need to ascend the tree: for 
the Nat of the winds shake it, and make the flowers 
fall; and left the beauty of the flowers should be 
spoiled, the winds support them, nor permit them to 
touch the ground. The whole bodies of the Nat are 
then covered with the odorous dust coming from the 
flamens of the flowers.

The stature of these Nat is three gaut: and the du-
ration of their lives four times that of the Nat Zadu-
maharit, or thirty-six millions of our years. The 
Nat
Nat of this habitation, like those of the higher kinds, do not require the light of the sun or moon, the light of their own bodies being sufficient: for they shine like so many suns or stars."

"XIX. It has been mentioned*, that the mountain Mienmo is sustained by three feet of carbuncle†. Now the space that lies between these is the habitation of a kind of Nat named Affura. Although these Nat inhabit a different abode, yet are they exactly of the same kind with the Tavateinza: for they were driven by guile from that habitation, which formerly they occupied. The manner in which this happened, is related as follows in the Burma writings. Godama, before he became a god, when he was in the state of a man in Zabudiba, with thirty-two other men of the same village, by the good work of repairing the high ways, and by other virtuous actions, deserved after death to become Nat Tavateinza. On their arrival the ancient inhabitants of that happy abode, in sign of their joy, and with flowers in their hands, descended half way down Mienmo, in order to welcome their future companions. Godama, who then was called Maga‡, began to contrive, how he might drive these Nat from their ancient possessions. He and his companions accordingly pretended to have drunk wine: but what they drank, was not true wine. The former Nat Tavateinza, imitating the example of these men, drank real wine, and became intoxicated. Then Maga making a signal to his companions, they dragged the Nat, while insensible with wine, by the heels, and cast them out of the abode Tavateinza. But as the lot, acquired by the merit of the good actions of these Nat, was not expired, a habitation formed itself.

* Page 176 of this Volume.
† In place of saying that Meru is supported by three feet, the Brahmens alledge, that it is placed on the back of a prodigious tortoise.
‡ Godama is said by the Brahmens to be the son of Maga or Maja.
self for them between the feet of Mienmo; and this
habitation is called Assura bon, which in every thing,
except its sacred tree, resembles that called Tavateinza*. In Assura bon there is also a tree, under which
there are four immense stones, each of them 300 ju-
zana square. On these rocks sit the four Assura
princes, when they determine suits, and administer
justice to their subjects. Among these princes, in
the length of time, one has obtained suprême domi-
nion, and has become emperor of all the Nat dwelling
in this habitation†.

Besides this injury, the Assura have received an-
other from the new inhabitants of Tavateinza: for
the great emperor ravished a daughter of the Assura
prince. Mindful of these injuries, the Assura Nat
vowed perpetual war against the inhabitants of Ta-
vateinza. When they used to see their sacred tree
producing flowers different from those of their for-
mer abode, breathing revenge, they were wont to as-
cend Mienmo, and to take prisoners the giants, dra-
gons, vultures, and other similar Nat, retained by the
Tavateinza emperor as a guard for his frontiers. On
the report of this, the emperor mounting his elephant
150 juzana high, used to call to his assistance the Nat
of the sun, moon, and slars, and those of the winds
and clouds. He then created new forms of Nat, and
of these raised an army without the walls of the great
city. But the Assura prevailing, forced him to retire
within the walls. The rage of the Assura was then
wont to abate; and the emperor having collected his
forces, used to drive them from his walls, and to pur-

* We have here the most abominable cunning of Godama related as a
laudable action: for, as I observed before, among his followers, cunning is
looked upon as a virtue. (Page 185).

† The Burma monarchs, in their cities, courts, and manners, imitate as
much as possible, those described as belonging to the Nat princes; and of
course must greatly resemble the ancient princes of western India; from
whom undoubtedly these descriptions have been borrowed; and probably as
much resemble the originals, as the description in the Arabian Nights Entert-
 amments do the courts of Mohametan kings.
fue them in their flight. The *Affura* having failed,
touched a drum made of the claws of Cancer, and
then retired to their own abode. In these battles no
one was killed: the *Nat* only tore one another. Now,
however, the *Affura* remain quiet at home: nor do
they any more engage in warlike enterprizes*.

"According to what Godama taught, whoever
honours his parents †, and old age; whoever respects
the three excellent things, namely, God, the law, and
the *Rāhāns*; whoever abhors wrangling, and disputes;
whoever is charitable, particularly to the *Rāhāns*:
all such persons shall after death transmigrate into
*Tavateinza*.”

"XX. Concerning the happiness enjoyed in the
higher abodes of *Nat*, and by the *Rupa*, and *Arupa*,
the *Burma* writings are silent: they only in general
state, that the happiness of each habitation is double
of that in the one immediately below. It is also
stated, that the lives of the inhabitants of each *bon*,
endure four times as long as those of the next inferior
species. According to this ratio, the duration
of the life of all the beings above *Tavateinza* in-
creases: so that the highest rank of *Nat*, called *Para-
neiminatavassanti* live 576 millions of years. The
prince of these *Nat*, whose name is *Mannatmen*,
has dominion over all the *Nat* of the other inferior
habitations, and declares war against any new god
on his first appearance. All his subjects being drawn
out in battle array, occupy a square of eighteen

* These *Nat* are evidently the *Affura Loka*, or demons of the *Brahmens*, who place them at the south pole, while the north is occupied by the *Devas* or *Deities*.
† Filial respect seems to be almost equally strong among the *Burmas* as among the *Chinefe*. No *Burma* is permitted to sit on a seat equally honourable with that of his father: if the father is on a chair, he must sit on the ground; if the father is on the ground, the son must sit behind. The son does not eat in his father’s presence, and rarely speaks, except to answer a question.
"juzana*: he himself being in the center, is seated on "an elephant 250 juzana high."

" XXI. The Burma writings, as has been said, make "no mention of the kind of happiness enjoyed by the "Rupa and Arupa: but if we may judge from the "length of their lives, they must be infinitely more "happy than the Nat. Of the three habitations, which "form the first Zian, the first Rupa live twenty-one "Andrakat; the second live thirty-one Andrakat; and "the third live one Assemchikat. Of the three abodes "in the second Zian, the Rupa of the first live two "Makakat; of the second, four Makakat; and of the "third, eight. Again, of the abodes which are called "the third Zian, the Rupa of the first live sixteen "Makakat; of the second, thirty-two; and of the third, "sixty-four Makakat. Of the two abodes forming the "fourth Zian, the Rupa live 500 Makakat. Of these "five remaining abodes of Rupa, which are placed "perpendicularly above one another, the inhabitants "of the first live one thousand, of the second two thou- "sand, of the third four thousand, of the fourth eight "thousand, and of the fifth sixteen thousand Makakat, "Again, the life of the inhabitants of the lowest order "of Arupa lasts for 20,000 Makakat, of the second for "40,000, of the third for 60,000, and of the highest for "84,000 Makakat.

"The happiness and length of the lives of beings "increasing in proportion as their habitations are "higher, a greater and greater elevation will be pro- "cured by persons after death, in proportion as during "life they have performed more good actions, and as "they have possessed more liberality in bestowing "charity."

" XXII. I am now to give an account of the abodes "of wretchedness, of the punishments inflicted on their "inhabitants,

* I suspect that there is an error in the number here stated.
inhabitants, and of the duration of their existence. There are four states of Apé or misery. 1. That of animals, whether they live in the water, or on the earth, or whether they fly in the air: for, according to the Burma writings, the state of all animals inferior to man, is a state of misery. 2. That of the wretched beings called Preitta. 3. The state of those called Assurighe. 4. The state of the inhabitants of Niria, which may properly be translated hell. Of these beings I shall treat in order.

The Burma scriptures mention nothing concerning the wretchedness or length of life of animals. Some doctors however assert, that domestic animals follow the fortunes of mankind: and that, when men live long, they do so likewise. These doctors also suppose, that animals not domestic have a short or a long life, in proportion to the merit of their actions in a former existence. It is however, say they, found by experience, that the elephant lives sixty years, the horse thirty, the ox twenty, and the dog ten. By the same doctors it is allledged, that lice, and other similar insects, live seven days; and they confirm this by a story related in their books. A certain priest conceived a violent liking for a beautiful robe, which he preserved most carefully from being worn. It so happened, that when this priest died, he was immediately changed into a louse, which took up its residence in the favourite robe. According to custom, the other priests divided amongst them the effects of the deceased, and were about to cut up the robe, when the louse, by his frequent going and coming, and by his extraordinary gestures, showed, that the division of the robe would be by no means agreeable to his feelings. The priests being astonished, consulted God on the occasion, who commanded, that they should delay for seven days their intended division, lest the louse should be enraged, and on that account descend
"descend into a state of misery yet more wretched.
"Those men are changed into animals who do not
"restrain their tongues, or the inordinate motions of
"their bodies or minds, and who neglect to bestow
"alms."

"XXIII. The second miserable state of existence
"is called Preitta, of which there are various kinds.
"Some Preitta are nourished on spittle, excrement,
"and other foul substances, and dwell in public halls,
"cisterns, and sepulchres. Others, wandering about
"in woods or deserts, half wasted by hunger and
"nakedness, pass the whole duration of a world in
"howling and groans. Some by fiery whips are forced
"to plough the earth with red-hot iron. Some, who
"live on their own flesh, with their nails tear to pieces
"their own limbs. Others, who are a gaut in size,
"have a mouth no larger than the eye of a needle,
"hence are they tormented with perpetual hunger.
"Others are within on fire, so that at times the flames
"even burst through their bodies. There is still
"another species of Preitta, who by day enjoy the
"pleasures of the Nat, but by night are tormented
"as above. Those in a future life are changed into
"Preitta, who during this give no daily provisions
"to the priests, who do not supply them with clothing,
"who corrupt their manners, or who offer
"violence to their persons, who give abusive language
"to the observers of the law, who are avaricious, &c."

"XXIV. The third miserable species of beings,
"called Affurighe, reside chiefly in the roots of certain
"mountains far remote from the habitations of men.
"Some of them however dwell in woods, and on the
"desert coasts of the sea. They are subject to punish-
"ments nearly the same with those of the Preitta.
"There is a kind of intermediate species, called
"Affurighe-Preitta. These beings have bodies three
"gaut in length, but as emaciated as a corpse deprived
"of flesh and blood. Their eyes project from the sockets
"like those of a crab: and their mouths are on the
"crows
crowns of their heads, and as small as the eye of a needle, so that they are tormented with hunger.

Those are subject to this punishment, who in their quarrels strike with sticks, or destructive weapons.

The duration of these three Ape is not fixed, but depends on the lot of evil actions, as the Burma doctors speak. "If this lot be heavy, the misery will continue long: but if light, the unhappy beings will be the sooner relieved from punishment:" that is to say, according to the greater or less atrocity of the sins committed, the punishment will be of longer or shorter duration.

XXV. Niria is the fourth miserable condition; and its habitation may be properly called the infernal regions. These are placed by the Burmas in the depths of this southern island Zabudiba, in the midst of the great rock Sila pathavy, and consist of eight great hells. Each great hell towards the four cardinal points has four gates, leading to as many smaller hells: so that every great hell communicates with sixteen smaller ones, and besides is surrounded to the right and left by 40,040 still smaller. A space of 10,000 juzana square is occupied by each of the large hells, and its dependant small ones.

Before the gate of each great hell sit the judges, who condemn the guilty according to the weight of their lot of evil deeds. These judges are selected from the Nat Affura: but their office does not prevent either them or their assistants from enjoying the pleasures of their happy companions. These judges have no occasion to examine into crimes of a very atrocious nature: the weight of these, say the Rāhāns, sinks the perpetrators at once into hell. These Imamem or judges then determine the punishments for smaller crimes. The worshippers of Bouddha, when bestowing alms, or performing other
other good actions, commonly use the ceremony of pouring a little water on the ground, which is explained to be emblematical of their wishing to participate the merit of good works with other beings. Those criminals, who during life performed this ceremony, the Imamén will mildly raise up, will assuage their fears, and exempt from the torments of hell, unless they have been guilty of any great crimes. But to those who have neglected this ceremony, the Imamén, with a horrible countenance, will declare, that they have done no good action; then the criminals, all trembling, will dare advance no excuse: but the demons will advance, and snatch them away to punishment."

"XXVI. The duration of these punishments, as has been already said, is not fixed and determined, but depends upon the lot of bad actions. The Burma writings enumerate four of these lots: the first they say is heavy, the other three light. The evil deeds, which after death produce the heavy lot, are chiefly five: 1, matricide; 2, parricide; 3, slaying a Rāhān; 4, striking a God; (thus Deva-Dāt, the name by which the Rāhāns know Jesus, incurred the heavy lot by throwing a stone at Godama;) 5, exciting dissentions among the Rāhāns. Those who have been guilty of such crimes, for the whole duration of a world, suffer, in one of the great hells, the punishment of fire, and other cruel torments. This lot is called heavy, and the first, because those who die under its weight, enjoy no benefit from the good actions they may have performed; at least, till the whole time of their punishment has expired. But even more severe than this is the lot of those called Deitti, or those impious persons who have discredited the evidences of Godama, or of some former God: who, contrary to the express doctrine of all Gods, deny Nieban, and the transmigration of men into animals, or into superior beings, according to the merit of their actions; who
who teach, that there is no merit in bestowing alms, or in performing the good works commanded by God; or who adore the Nat presiding over the woods and mountains. All such persons, if they obstinately persist in their infidelity, and irreligion, will be tormented, not for the duration of one world, but to all eternity. After the world is destroyed, they will pass to other places, or be eternally punished in the air. But if obstinacy be not added to their crimes, the punishment will cease at the end of the world.

Of those lots which are not heavy, the first is that which receives a reward or punishment after death; and such crimes are punished in one of the great hells, according to their greater or less atrocity.* After this comes the lot of habitual sins; and though these sins be not atrocious, yet if they have become habitual, they occasion a lot, which induces a punishment in one of the seven great hells; but not in that named the great Aviri. The fourth lot arises from wicked desires, and is not punished in any of the great hells, but in some of the surrounding small ones.

XXVII. Before we mention the punishments which the damned suffer, it must be premised, that of the eight great hells, four are called Aviri or hot, and four Logantret or cold hells: because in these last the damned suffer intense cold. The infernal days and years also differ from those on earth: for every day in the great hells is equal to a thousand terrestrial years; whilst in some of the small hells it equals 600 years, in others 700, and in others 800.*

1st. Those who are irascible, or cruel, quarrel-

* The original here is very obscure. I have translated it, as nearly as I could, word for word; but I am not satisfied about the meaning. Perhaps it is, that such crimes induce this lot, as are of a nature not to require the determination of the Imamcn: and such, as that their opposite virtues lead to immediate high rewards?
lous, or drunken, who are dishonest in deed, word,
or thought, or who are lascivious, will, after death,
in the great hell Seinzì be torn to pieces with glowing hot irons, and then exposed to intense cold:
after a time their limbs will again unite, and again
will they be torn asunder, and exposed to the cold:
and this alteration of misery will endure for 500 in-
fernal years.
2dly. Those who either by action or speech ridicule their proper parents, or magistrates, or Rāhāns,
or old men, or the studious of the law; those who
with nets or snares entrap fish, or other animals;
all those will be punished in the great hell Chalasot
for 1,000 infernal years: on a bed of fire they will
be extended, and like so many trunks of trees with
burning iron faws and hooks they will be cut into
eight or ten pieces.
3dly. Those who kill oxen*, swine, goats, or
other such animals; and who are by profession hun-
ters†; warlike kings; ministers and governors who
oppress the people; all such will in the great hell
Sengāta be ground between four burning mountains
for 2,000 years.
4thly. Those who do not mutually assist their
neighbours, and who on the contrary deceive and
vex them; those who kill animals by immersing
them in boiling oil or water; those who are drunk-

* The present Burma monarch, who enforces religious duties with considerable rigour, in a very particular manner punishes the death of the cow kind. The Rahans, it is evident, look on the killing of all animals with equal abhorrence; and it is probable, that the Brahmens have in this infancy influenced the councils of the prince, and have deprived his subjects of a most wholesome and invigorating aliment.

† Venison is the only meat permitted to be sold in the markets of the Burma empire, a privilege allowed to hunters, most probably on account of the Royal family. The hero Alounghura, the deliverer of his country, and father of the king, was originally a hunter. He had the good sense not to be ashamed of his origin, and, when he first rose into notice, assumed the name of Moutsobo, or the hunter-captain, a name which he beffowed on his favourite residence, when his merit and fortune had induced his subjects to call him the lord of the world.
ards, or who commit indecent and forbidden actions; those who dishonor others; all such will have their bowels consumed by fire entering their mouths. This punishment will last for 4,000 infernal years.

5thly. Those who take any thing contrary to the express will of the proprietor, whether it be by theft, guile, fraud, or by open violence; those magistrates who receive gifts, and in consequence decide causes unjustly; those officers who, after having possessed themselves of an enemy's country, destroy the inhabitants; those who deceive in scales, weights, or measures, or who by any other unjust means appropriate to themselves the goods of others; those who injure the property of the Rāhāns, or temples; all such, for the space of 8,000 infernal years, will be punished in the great hell Mahatapana by fire and smoke, which will enter by the eyes, mouth, and other openings, and waste away their whole bodies.

6thly. Those who having killed hogs, deer, or such like animals, skin them, roast their flesh, and eat it; those who make arms; those who fell hog's flesh, or fowls, or wine, or poison; those who burn towns, villages, or woods, so that the animals living there perish; those who kill men by poison, arms, or incantations, or who kill animals by nets or gins; all these after death for sixteen thousand years will in the great hell Tapana be tumbled down headlong from a lofty burning mountain, there being transfixed on an iron spit, they will be cut and torn by the demons with swords and spears.

7thly. The Deitti, or infidels, who have been already mentioned, will in the hell Mahatapana be first fixed with their heads downwards, and then pierced with hot spits as large as palm trees:

8thly.
"8thly. Parricides, matricides, and such as have
the heavy lot, will be punished for the whole dura-
tion of a world in the terrible of all hells Mahaviri,
the pavement of which nine juzana in thickness is of
red hot iron, and emits the most horrible smoke,
and the most piercing flames."

"XXVIII. Of the smaller hells, which surround
the eight great ones, and which are called by one
common name Ufiantrek, some are mentioned by
particular names. In the excrementitious hell, for
instance, there are worms as large as elephants,
which bite the damned while they are floating in
excrement. There is also a hell of burning ashes.
In the hell of swords the damned are torn in pieces
by the knives, swords, and other sharp instruments,
among which they are rolling. The damned in the
hell of hooks have their lungs, livers and bowels
torn out by these cruel instruments: and in the
hell of hammers they are miserably beaten with red
hot implements of that kind. There is a hell of
thorns and prickles, a hell of biting dogs, a hell of
crows and vultures, which with their beaks and
claws tear asunder the flesh of the damned. There
is a hell in which the damned are obliged constantly
to ascend and descend a tree named laeppan, and
armed with the sharpest thorns: another in which
they are forced to drink putrid gore; and still another,
where fiends beat, whip, and torment the damned.

"In the smaller hells are punished those who did
not honour their parents, magistrates, and old age;
who took wine or inebriating drugs; who corrupted
the waters of lakes or wells; who destroyed highways;
who were fraudulent and deceitful; who spoke roughly
and angrily; who struck others with their hands or
sticks; who paid little attention to the words of pious
men; who afflicted others; who were speakers of scan-
"dal,
dal, passionate, envious, undervaluers of their neighbours; who used abusive language; who confined their fellow creatures with chains, bonds, or fetters; who admitted any forbidden thing in their words, actions or desires; and who did not console the sick with soothing words. All these crimes will be punished in the smaller hells, and that in proportion to the atrocity of the deed, and the frequency with which it has been repeated.

Besides these places of punishment there is another hell, which may be compared to an immense kettle filled with melted brass. The damned are forced to descend to the bottom of this kettle, then to rise to the surface, and 3,000 years are consumed in each descent, and in each ascent. To this hell are condemned the sensual persons, who corrupt the wives, the daughters, or the sons of others; and who, during the course of their lives, neglecting to observe the holy days, or to give alms, pass their time in feasting, drunkenness, and lascivious enjoyments.

It has been already mentioned, that the equilateral spaces, which are supposed to be in the interstices of the different worlds, are full of water intensely cold. The Burma writings assert, that these are so many hells, to which those are condemned who give offence to their parents, or to the strict observers of the law. These people after death get bodies three gaut in length, with crooked nails on their hands and feet: sometimes like bats they creep through the caves, and dark caverns in the deep recesses of the mountains: at others they hang together on trees like a hive of bees, mutually tormenting and abusing themselves with the most direful words; then being infigated by a cruel hunger, they tear each other limb from limb. The limbs falling into the cold water are dissolved like salt: but the parts of their bodies being again united by
the power of fate, they repeatedly undergo the same
torments.

* Having thus explained the ideas of the Burmas
* concerning the various bon, or habitation, of misery
* and happiness, before we proceed any further, it is
* necessary to state, that the beings which inhabit
* even the highest of these abodes, may, on account of
* bad actions, sink into the infernal regions; or on
* account of their good ones, may be raised to a higher
* rank: but it is only in this island Zabudiba that
* Nieban, the most perfect of all states, can be ob-
* tained. To arrive at Nieban a person must see a
* god, and hearken to his discourses and evidences:
* and it is only in Zabudiba that the gods arise.
* There are some Burma doctors indeed, who assert,
* that in this island only beings can deserve to rise to
* a superiour, or to sink into an inferiour abode.

A TOPOGRAPHICAL DESCRIPTION OF
ZABUDIBA.

* I have said, that the Burmas allow the diameter
* of this island, which we inhabit, to be 10,000 juzana.
* From this extent they subtract 3,000 for woods and
* deserts, 4,000 for waters, and suppose 3,000 to
* remain as a habitation for mankind. I shall now
* explain their ideas concerning the topography of this
* abode: but my readers will be much disappointed,
* if they expect any thing like an accurate description
* of the earth, or of its divisions into kingdoms and
* provinces. For in the same manner, as what I have
* already delivered as the opinions of the Burmas
* concerning the universe, are nothing but vain,
* chimerical, and monstrous fables; so what they relate
* concerning the island Zabudiba, never existed, unless
* in the invention of Godama, or in the crude con-
* ceptions of his commentators. It is true indeed, that
* in the Burma writings mention is made of 101 nations,
* which are said to inhabit Zabudiba, and its dependant
* small islands: but of all the nations which are
* known really to inhabit the earth, we find none men-
* tioned
tioned as a part of the one hundred and one, except the Chinese, Siamese, and the inhabitants of Tavoy, Pegu, Laos, Ceylon, and Arakan."

Thus Sangermani prefaced his account of the Burma geography: but I think some farther explanation necessary. The reader will soon perceive, that the missionary is entirely right with regard to the imperfect and absurd nature of the Burma topography of Zabudiba, of which the accounts seem evidently to have been introduced from Hindustan, along with the religion and laws of Bouddha, and of Menu: but I doubt not, that some parts of these accounts are derived from an observation of nature. I am also inclined to think, that he is rather severe on the knowledge which the Burmas possess of the geography of at least their neighbourhood. I found many of the Burmas who were very intelligent, and well informed, concerning the situation of the different parts of their extensive empire; who were not at all deficient in a knowledge of the neighbouring states; and who were very curious to know the situation of those at a greater distance. They at once comprehended the nature of our maps; and some of them could make delineations of their own country, which, with a considerable degree of neatness, were sufficient to give a tolerable idea of the course of rivers and mountains, and of the situation of towns, lakes, and provinces. I was informed, that, in the hall of the grand council in the palace of Amrapura, the king keeps a general map of his dominions, which has been corrected by comparing it with the various expeditions which the present royal family have undertaken, and with the lists of cities and villages, which the governors of provinces are annually obliged to transmit to court: and in these lists is given an accurate account, or one pretended to be so, of all the houses and male inhabitants in each district. Merchants and travellers put down in their books the names of all the places on such routes as they frequent, with their estimated distances: some such itineraries, and many of their delineations, I
have communicated to Sir John Shore: and if my stay in the country had been longer, I make no doubt, but that I could have procured several of the lists transmitted to court by the governors of provinces.

For the sake of the curious I shall here transcribe the list of the one hundred and one nations with which the Burmas are acquainted, using the mode hereafter to be explained of expressing the Burma writing by Roman characters, and adding a short explanation. From this I think it will appear, that the list is formed from a real knowledge of the nations, and not from the idle fables brought from Hindustan, and explained by the missionary. It is true, that of many of these names I can give no account; but that will by no means imply, that no such nation exists; for who would think that Tarout meant a Chinese, or Kula an European?

Loo mioo tawatābā. Of men the nations one and an hundred.

1 Myam-mār, The proper name of the Burmas.
2 Tā-lain, The inhabitants of the kingdom of Pegu.
3 Yun, The inhabitants of Sayammay or Chiamay.
4 Yoo-dā-yū, The Siammese.
5 Sham, The grand Siams of M. De La Louberè.
6 Løyn-foyn, The inhabitants of lower Laos or Lanjans.
7 Gium, These are two small rude tribes living in hilly and woody tracts in the Sham country.
8 Kiuun, }
9 Dha-nu, A rude tribe inhabiting the banks of the river Thalluayn, north from Martaban.
10 Kā-raysn, A rude tribe inhabiting the woods of the Pegu kingdom, and those near Prone.
11 Ku-lā,
11 Ku-lā,
12 Pā-deik-kā-rū,
13 Dā-way,
14 Rāk-kaik,
15 Ayn-giay,
16 Tā-nayn-thā-rē,
17 Sō-gē,
18 Kieen-zout,
19 Tā-rout,
20 Tā-rāk,
21 Layn-thāk,
22 Pan-thē,
23 Pālē,
24 Pā-laung,
25 Thout-tan,
26 'Zu-laung,
27 'Zu-lē,
28 Tā-ba-thē,
29 Hā-rē,
30 Zan-dā,
31 Māl-lā,
32 Sā-wā,
33 Sā-wē,
34 Zeim,
35 Lē-hu,
36 Lā-nyayn,
37 Zayn-g'yan,
38 Kian-dan,
39 U-thā-bā,

The Europeans, or the natives of the west.
Another western nation; but which, I could not learn.
The natives of Tavay.
Said to live between Cussay and the Kiaynthia.
The natives of Tenasserim.
Hermits.
Said to live near Cussay.
The Chinese.
The Tartars governing China.
Said to be an independent people living near China.

\{ Inhabitants of the mountains north-east from Ava, who
pick the tea leaves so much used in the Burma kingdom.
\}

Said to live seven days journey west from Ava.
Live north from the last mentioned people.

Zandapōre is the name of the capital of Laos.
O N T H E R E L I G I O N A N D

40 Lā-pē-kā, A people inhabiting the hills between Arakan and Chittagong, called by the Bengalese, Moroong.

41 Myoun, The Malays of Acheen.

42 Goun,
43 Pat-tu,
44 Zū-da,
45 Nā-ha,
46 'Bū-daung,
47 Layn-yaung,
48 A-thū,
49 Payn-gā,
50 Meit-zeit,
51 Lā-haék,
52 Rē-mē-duēk,
53 Kan-zæk,
54 Taung-thū,
55 Pyu,
56 Kō-zū,
57 Kam-yan,
58 A-myayn, A Burma city of this name.
59 Kā-kiayn, A wild people on the frontiers of China.

60 Thouk-kāda, A Siammese city of this name.
61 Lā-ba,
62 Shein-dū,
63 Rē-dū,
64 Payn-wā, A Burma city of this name.
65 Meiz-zā, A very numerous tribe inhabiting the woods to the east of the Martaban river.
66 La-wa,

67 Rē-zun,
The people inhabiting the eastern branch of the Naaf river, who have sent a colony to the upper parts of the Curnasfooly, and who are called by the Bengalese, Chatn and Chatnmas.

A tribe between Martaban and Siam.
2^0
ON THE RELIGION AND

93 Lā-rouk,
94 Pā-gnā,
95 Biā-bā,
96 Ram-man,
97 Kiayn, A numerous tribe in the mountains separating Ava from Arakan.
98 Pyō,
99 Lā-waik, The capital city of Cambodia.
100 Layn-nat,
101 Oo-byee,

But let us now return to the description of Zabudiba, as extracted by the missionary from the Burma writings.

"XXIX. In the most northern parts of Zabudiba, "the Burma writers place an immense mountain, of "which the perpendicular height is 500 juzana, and "the extent it occupies is in circumference 9000 "juzana. It is named Hemavunta, on account of the "perpetual snow with which it is covered*; and "consists of 14,000 small mountains, one piled on "another. In the declivities of this mountain are "seven lakes, which receive the water produced by "the melted snow. Of these lakes the depth is fifty "juzana, and the circumference 150. From these "lakes spring five great rivers, one of which is named "Gunga; and from these rivers arise five hundred "smaller streams. On Hemavunta grow various "species of sandal wood: on this mountain live many "Nat of the kind named Zadumaharit: and here are "found the kings of elephants, and of horses, with many

* This Hemavunta is evidently the mount Imaus or Emodus of the antients, or the Himalae or Himalaya mountains of the present Hindus; all the three names deriving their origin from the phenomenon of snow, so wonderful to the inhabitants of tropical regions. Plin. Hist. Nat. L. 6, c. 17.—Rennell's Memoir, p. 126."
many other animals not to be found near the habitations of man. Of these lakes the most celebrated is called Anaudat*, which is surrounded by five mountains. These mountains, which are five hundred juzana high, incline their lofty summits over the lake, and prevent the sun's rays from reaching its waters, except for a short space annually, when the sun is in the inner road.

The bowels of one of these mountains contain most copious mines of gold, and even its surface is thickly covered by that precious metal. The surface of the second mountain is covered with silver, and it contains also rich silver mines. The third contains mines of diamonds and rubies, and these stones glitter on its surface. The fourth of these mountains is also impregnated with all manner of jewels; and the fifth is covered with sandal-wood, clove and nutmeg trees. In this aromatic mountain are three arched habitations; one of gold, another of silver, and a third of carbuncle; and before these abodes grows a flowering tree one juzana high.

In this delightful place dwell certain hermits, and men of eminent sanctity and morality, who appear in this world when the law of any god ceases. For the Burma writings declare, that when a god appears, and reveals his law, men are only bound to observe it for a fixed number of years after his death, at the expiration of which time every one is at liberty to follow the law of nature. Such is the brightness proceeding from these mountains, that it excludes the darkness of night.

The water of Anaudat is limpid like crystal, nor does any foul thing live on its shores. Neither turtle nor fish dare swim in it; for the water is destined to be the drink of those illustrious saints above-mentioned. Only some Nat giants sport in the lake.

On the eastern bank of Anaudat is the image of a lion's

* The name, as pronounced at Amarapura, seemed to me to be No-wa-dat.
“lion’s head, on the southern that of an elephant’s,
“on the western that of a horse’s, and on the northern
“that of a cow’s: and from these four heads are
“poured forth the streams of four rivers. The water
“which proceeds from the lion’s mouth, after making
“three turns round the lake, and mixing with the
“other waters, rushes through the eastern parts of
“Hemavunta; and after flowing through many in-
hospitable regions, at length falls into the eastern
“sea*. In the same manner the waters, which pass
“through the northern and western mouths, after
“running thrice round the lake, form two rivers; one
“falling into the western †, the other into the northern
“sea‡. The water which flows from the elephant’s
“mouth, after turning, like the others, three times
“round Anaudat, runs directly south for sixty juzana,
“when ascending a small mountain, and rushing over
“an immense rock, it forms another lake fifty juzana
“in circumference; passing thence through a sub-
terraneous passage for sixty juzana, it meets a great
“mountain||, which divides it into five large rivers,
“each of which has its proper name: and these are
“the five great rivers already mentioned, of which
“one is the Gunga or Ganges.§ From each of these
“five rivers proceed a hundred small ones; in all five
“hundred small rivers. But the banks of each of the
“four great rivers abound in that species of animal,
“from the image of whose head its waters rush out of
“the lake Anaudat. Thus the banks of the southern
“river

* This river is probably the Yang-tse kyang, the greatest river of China,
and the source of which is at no great distance from that of the Ganges.
† The western river is no doubt the Oxus Fihon falling into the
Caspian Sea; beyond which it is probable, that the Hindus in the age of
Buddha knew nothing.
‡ This is probably the immense river Irtis, of which the source is about
1,000 miles north from that of the Ganges.
|| Probably Sewalick.
§ To me this appears evidently to be an ill-digested account of the
rivers, which fall into the head of the Bay of Bengal. The authors of the
system conceived them all to come from one source, but that, by the inter-
vention of the Sewalick mountains, they were separated into the form
which they assume in Hinduism.
"river abounds in elephants, of the eastern with lions, of the northern with oxen, and of the western with horses."

This fable was at Amorapura often mentioned to me. The names of the five hills surrounding Amau-dar are, Sudafana, Pathoda, Gandomadena, Kelasapa, and Seitera. The five branches of the elephant or southern river are Gaynga, Yemuna, Mohé, Therapoo, and Rawadé. I am convinced that this fable, not sufficiently understood, has been the foundation of the idea represented in many maps, of there being a lake Chiamay, from whence the Ganges, Burrampooter, Ayrawade, and other great rivers, take their rise. This opinion was confirmed by the mention of Chiamay made by M. De La Loubere; but the city so named by that excellent author, (as the maps I presented to Sir John Shore clearly prove,) is the capital of a kingdom at present subject to the Burmas, and situated on the river of Siam, which arises on the frontiers of China.

This topography, mentioned in the books of the Rāhāns, however incorrect, in my opinion clearly points out the country in which the doctrine of Bouddha commenced. It must have been on the banks of some of the branches of the great southern river: and the northern parts of Hindustan are the most probable. Bouddha's knowledge of geography must have been very confined; but as we approach towards the place above mentioned, it assumes a form somewhat more particular and rational. From the accounts of the mountains, snow, seas, and rivers, given by his followers,

* By this account the Ganges should not come through the cow's mouth, but through the elephant's. The Brahmens apparently have misconceived this part of the fable; and the rock called the Cow's mouth, seems, as we extend our knowledge of geography, to elude our search. (Rennell's Memoir, p. 371). The learned Paulinus has, as I have already mentioned, (Note in p. 175), confounded the fables of the mountains Mienno and Hemavunta. Perhaps in this he has followed the Brahmens, from whose works chiefly his ideas seem to have been taken: and the Brahmens may differ from the Rahans as well concerning the situation of these mountains, as concerning the cow's mouth.
lowers, we may conclude that he was a near neighbour of Thibet: we may suppose, that he had seen the snowy mountains, and had heard of the great rivers running from thence into the Siberian, Chinese, and Caspian seas: and from his particularizing the branches of the southern river, we may conclude, that he dwelt on its banks. Had he been a native of Thibet, he never could have formed the gross misconception of the common origin of the Bengal and Oude rivers, nor of their manner of penetrating through the Sewa-
lick mountains. I find that some persons* have all-
ledged Bouddha to have been a native of Aria or Korosan. On what reasons this opinion is supported, I have not learned: but I think very strong ones will be required to invalidate this topographical argument, for his having been a native of the north of Hindustan. Upon consulting a Brahmen of Bengal, who is ac-
quainted with the Sanscrit language, he says, that BouddhA was king of Rahar, which, according to him, is bounded on the east by the river of Moorshedabad, and from thence extends to Benares, being nearly the same with the souhAB of Behar†.

As far as relates to Hindustan, the Brahmens have adopted very nearly the geographical ideas of their predeceffors the Rähuns‡: but having come from Egypt, their knowledge of the western parts of the world

* Encyclopedia Britannica, article Samanians. This opinion may have originated from two passages in the fathers with which I have met in Paulinus, (Mus. Borg. pag. 186 187.) καὶ εὐωφόρον τέκτων Σάμαντων Κυρίλλ. Alex. Tom. 2. pag. 133. καὶ Σάμαντως Βεστιλιανὸς Κλέμενς Ἀλεξάνδρ. Στρόμ. lib. 1. pag. 359. The knowledge which the fathers of the church had of the sect of Bouddha, being chiefly obtained from such of the Samanians as resided in the Persian empire, and who must have entered Iran from Hindustan by the common route of Bactria, may readily account for these two passages.

† Bouddha, the son of Jīna, according to the Bhagawat, would ap-
pear at Cicata, which by a learned Hindu was said to mean Dherma-
ranga, near Gaya, (Afiatick Researches, II. 122,) But whether this Bouddha be the same with the author of the Burma religion I do not know.

‡ See a treatise by the learned Mr. Burrows in the Afiatick Researches.
world is much more extensive: nor need we require any further proof for their having come from Egypt, than their compleat knowledge of the Nile, which has been so ingeniously illustrated by the learned Mr. Wilford.

"XXX. Next to the lake Anaudat," continues "the missionary, "the most celebrated is that called "Zaddan, nearly equal in extent to Anaudat. In the "center of the lake, limpid water of a carbuncle colour "occupies a space of twenty-five juzana, around which, "in concentric circles, are placed five gardens, each a "juzana wide. In these gardens grow the various kinds "of flowering trees which thrive in water. Without "the lake are fields of corn, esculent seeds, gourds, "and cucumbers. Without these fields are gardens "containing every kind of fruit trees: such as a gar- "den of plantains, producing fruit as large as an "elephant’s trunk; a garden of ratans; and the like. "Lastly, without these gardens are fields of cotton. "All these fields and gardens surround one another "in concentric circles, and each is a juzana wide. "Without these gardens and fields the lake Zaddan "is surrounded by a mountain one juzana high, "of which the surface is covered with gold reflecting "a light that makes the whole lake shine. This "golden mountain is surrounded by another six juza- "na high, and full of carbuncles. This again is sur- "rounded by a mountain five juzana high, and emit- "ting from its side next Zaddan a splendor equal to "that of the sun. Round this is another mountain "four juzana high, and shining like the moon. Ano- "ther mountain beyond this sparkles like crystal. "And lastly come two mountains; the one two, the "other one juzana high; and of both the interior "surfaces are black.

"To the west of the lake Zaddan, in the golden "mountain, is situated a celebrated cave, filled with "gold and jewels, and of which the mouth extends "twelve juzana. To the north is another lake, fifty "juzana in length, and as much in breadth. Its limp-
id waters nourish various flowering trees, and its sands are the minute fragments of diamonds and crystals.

Between these two lakes grows the great Gnaung-bayn*, a tree sacred among the Burmas, because under its shade, say they, Godama received his divine nature. Many smaller trees of the same kind surround the great Gnaung-bayn, and under the shade of one of these is the king of the elephants wont to reside. This king, from the place of his abode, is often named the elephant Zadda. Eight thousand elephants, white, red, and black, are in his train; and he has three queens. When he goes into the lake, to wash and to amuse himself, he is attended by all the 8,000; part of whom go before and clear the way: others, while he is washing, weave crowns and belts of flowers, which, on his coming out of the water, they present to their king, who thus adorned returns to the great tree: the elephants then in proper order, first the white, then the red, and then the black, go into the lake to wash themselves: and on coming out, having adorned their bodies with flowers, they go and stand in the presence of their king. Then the black elephants plucking some flowers from the tree, give them to their females, who deliver them to the female red elephants, and these again to the white females, who present them to the king, and to his queens, that they may eat. Then the others disperse themselves through the woods, every one finding his own food. And thus they daily pass their time. During winter they live in the great cave above mentioned, and during summer under the great Gnaung-bayn, which from its trunk sends forth 8,000 large roots, one for every elephant.

XXXI. Near these same lakes, and the five others, are said to be found many extraordinary species of wild

* Ficus indica.
wild beasts, and of birds: and among others five kinds of the lion that frequents certain great forests. The most celebrated of these is the lion Chalarasi, whose throat, legs and feet, and the tip of whose tail, are red; and from the top of whose head a red streak runs along his back, and descending by his sides, terminates at the navel. His mane also is red, and his roar is heard through an extent of thirty-three juzana. The other animals, when they hear the tremendous sound, dare not remain in their resting places. His agility is wonderful; and his fleetness such, that in a moment he runs a league, taking 140 cubits at each spring. When he wants to unload his bowels, to enjoy a female, or to satisfy his hunger, he comes out from his cave, and roars thrice terribly. The echo answers all around for three juzana: and before the echo has ceased, he has preyed on many deer, and other animals. His strength is so immense, that he kills the largest elephant with the same ease as another lion would the timid hare. It is further said, that this lion sleeps on his right side, with his tail under him, and with all his limbs properly disposed. When he awakes, if he finds that during his sleep he has altered this posture, as a kind of punishment he stays in his cave all that day. There is also another kind of lion, which has a human head, but a lion's body. This kind is never seen but when a God appears on earth. 

XXXII. In these regions dwells a king of the Nat Bonmazo. He lives for the duration of a whole world, and his virtue is said to be great. It is related of this king, that at a certain time having passed through the whole world, he found all the habitations of the Nat nearly empty: for an immense multitude of Nat, as well as of men, had assembled in a certain kingdom to hear Godama, who was then preaching a divine sermon. Then great

This lion seems to be the Narfina of the Brahmans.

† Page 205 of this Volume.
great envy seized on the Nat king, because he observed all the Nat giving a preference to the holiness and virtue of Godama. With his subjects therefore he went to a burial place in the vicinity of where Godama was preaching. After having rolled themselves among the ashes of the dead, and having put round their necks broken urns, with loud shouts, and beating on urns in place of musical instruments, they advanced to the multitude, who were listening to the preacher, in expectation of diverting the attention of the hearers from the sermon. Many, who were of a volatile disposition, at the unusual found, turned aside their eyes; but the greater number neither looked aside, nor gave the smallest attention to the actions of the Nat; and Godama himself continued his discourse, as if nothing extraordinary had happened. The Nat therefore, perceiving that his attempt to disturb Godama was in vain, retired greatly discomposed.

On another occasion, when the same great Nat Bommazo saw Godama passing, he said to his companions contemptuously, and ironically, that the virtue of Godama was great; and impudently proposing to try which of them could perform the greatest miracle, he said, 'O Godama, let each of us hide his body, and see which will best discover the other.' Although Godama was sensible of the childifhness of such a trial, yet fearing, if he declined it, that both men and Nat would be apt to undervalue his divinity, he mildly indulged the Nat, desired Bommazo to hide himself, and at the same time with his hands he covered his face. The Nat prince by his power immediately changed his body into a particle of sand, and penetrating into the centre of the earth 100,000 juzana deep, he there hid himself. But Godama, although he had kept his eyes shut, perceived every thing by the power of his divine wisdom, and going to the aperture through which the grain of sand had entered, he covered with his left hand the opening, while with
his right he moved the earth, and forced the Nat
from his concealment. He then said, 'O Nat, come
forth!' The great Bommazo, thinking that Goda-
ma had done this by chance, wanted again to hide
himself: but Godama called out, and said, O Nat,
do you not know, that I am acquainted with the
most secret thoughts of your heart? Come out
then, nor any longer pretend not to hear.' Then
the Nat perceiving that he could be no longer hid,
came out, and turning to Godama, said, 'Now, in
your turn, conceal yourself.' Godama not con-
verting his great body into a grain of sand, but into
a most minute and invisible atom, stood upon that
part of the Bommazo which is between the eye-
brow and the eye-lid, and called out, 'Now seek
me.' The Bommazo hearing the voice of Godama
very near, immediately opened his eyes; and when
he could see nothing near, he began to look every
where after Godama. He searched the four great
islands of this earth, and the two thousand small
ones; he examined the whole ocean, and the lofty
and inaccessible mountains of Zetchiavala; from
thence ascending Mienmo, he visited the habitations
of all the Nat, the Rupe, and Arupu: he then pe-
netrated into several other worlds; but being at
length fatigued, and declaring himself overcome,
he said, 'O great Godama, no longer hide thyself,
but appear.' Then Godama forthwith creating a
magnificent ladder, composed of gold, and orna-
mented with pearls, applied it to the eye of the
great Bommazo; and assuming the natural size of
his body, and the most splendid ornaments, with the
greatest pomp, descended to the ground from the eye
of the Bommazo. This miracle being seen, the
great Nat astonished, threw himself at the feet of
Godama, and humbly confessing his arrogance and
pride, besought pardon; and from thenceforward,
he venerated Bouddha as a God: and not only during
the life of Godama, but ever since his death, this Nat
has continued to worship him carefully and devoutly."

OF
"OF THE DESTRUCTION AND REPRODUCTION OF WORLDS."

"XXXIII. The Burma writings allude three remote causes for the destruction of a world; luxury, anger, and ignorance. From these, by the power of fate, arise the physical or proximate causes; namely, fire, water, and wind. When luxury prevails, the world is consumed by fire; when anger prevails, it is dissolved in water; and when ignorance prevails, it is dispersed by wind. The Burmas do not suppose, that a world is destroyed and a new one instantaneously regenerated; but that the destruction takes up the space of an Affenchiekat, that the reproduction takes up another, and that a third Affenchiekat intervenes between the end of the old world and the beginning of the new."

"XXXIV. Before we proceed to explain the opinions of the Burmas concerning the destruction of a world, it will be necessary to recollect, that they suppose sixty-four alterations in the length of man's life to happen during the existence of one world*. They suppose also, that almost the whole human race perishes at each of those sixty-four periods, in which the length of life is reduced to ten years. And they farther suppose, that this destruction befalling the human kind is analogous to the crimes which have produced the fatal abbreviation of life. Thus when luxury prevails amongst men, the greater part of them perish by hunger, thirst, and wretchedness: when anger is the cause of short life, perpetual contentions and wars arise, and the bulk of mankind perishes by the sword or spear: finally, if ignorance be the prevailing crime, mankind, worn out by a horrid consumption, waste away to mere skeletons. After the greater part of men have by such disasters perished, a great rain falls; and sweeps away into the rivers the unburied bodies and filth. Then follows a shower of flowers and sandal-wood to purify the earth: and all kinds of garments

* Page 162 of this Volume.
"garments fall from above. The scanty remains of "men, who had escaped from destruction, now creep "out from caverns and hiding places, and repenting of "their sins, from henceforward enjoy longer lives."

The Burmas not only conceive, that the length of mens' lives is extended by virtue, and shortened by vice; but also that moral excellence, especially in their princes, is followed by much physical advantage, by a favourable change in the seasons and productions of the earth, and especially by a great abundance of the precious metals and stones*. This doctrine of the Divine Providence bestowing physical rewards upon moral excellence, although perhaps in many cases prejudicial to the good of society, seems to have been much admired by the late emperor of China Yong-tching, who was by no means a superstitious prince, but appears even to have rejected all the revelations introduced by various sects into his dominions. In consequence of some political intrigues of the Jesuits, as it is commonly supposed, he had banished the missionaries, which no doubt gave great uneasiness to many of their converts. Two governors of provinces endeavoured to persuade him, that, wherever temples of the God of armies (probably churches) had been erected, those provinces were exempted from locusts, and other destructive vermin: other officers had mentioned to him different superstitious expedients for procuring rain. In his answer, of which Grosier † has favoured us with a translation, he indeed treats as a ridiculous error the belief that prayers offered up to pretended beings can remedy our afflictions: but he at the same time lays it down as an infallible doctrine, that our plains may be desolated by inundations, drought, or insects, as a punishment inflicted by heaven on the emperor or his officers, who having deviated from integrity and justice, by that means may be brought back to a sense of their duty. Dalirand reges, pleâuntur Achivi.

R "XXXV.

* Note † in page 193 of this Volume. † General Descrip. of China, II, 135.
"XXXV. But to proceed with the account of the
destruction of a world; the Burma writings relate,
that 1,000 years before such an event, a certain Nat
descends from the superior abodes to this island. His
hair is dishevelled, his countenance mournful, and
his garments black. He paffes every where through
the public ways and streets, with piteous voice, an-
nouncing to mankind the approaching dissolution.
In the same manner as the fowls of heaven and the
fifth of the sea, by a certain natural instinct, have a
foreboding of storms; so the Nat in their minds per-
ceive the approach of a world's destruction. Then
mankind are strongly excited to an observance of
the law, and especially to the performance of such
good works, as may entitle them to ascend to the
abodes of the Rupa, and Arupa. These good works
are chiefly four: charity, the honouring of parents
and old age, justice, and the love of our neighbours.
The Nat are thus solicitous to encourage men in ob-
taining a place in the abodes Rupa and Arupa, be-
cause when the world is destroyed by wind in con-
sequence of mens' crimes, all the habitations of Rupa
and Arupa perish: but when it is destroyed by fire,
or water, many of these abodes remain untouched.

On hearing the terrible forebodings of the Nat,
men shudder, and with their utmost power apply
themselves to practice the four above-mentioned good
works. The Nat also who inhabit Mienmo, and the
superior abodes, are elevated to the different Zian.
The infernal beings, even the lots of whose evil deeds
have now expired, are born men, and endeavour to
lead such a life as may entitle them to a place in the
Zian. It is only for the impious, and for infidels, that
there is no salvation. Transferred to the frigid ipaces
interposed between the different worlds *, these sin-
ers are there left to undergo eternal punishment.

*Irrational

* Page 175 of this Volume.
Irrational animals are supposed to perish along with the world."

"XXXVI. It has already been stated, that the world is destroyed either by fire, or by water, or by wind. When it is to happen by fire, as soon as the Nat has ceased to admonish men, a heavy rain falls from heaven, fills all the lakes, causes torrents, and produces an abundant crop. Mankind, now filled with hope, sow feed more plentifully: but this is the last rain, not a drop falls for 100,000 years, and plants with every vegetating thing perish. Then die all animals, and passing on to the state of Nat, are from thence transferred to the abodes Zian or Arūpa. The Nat of the sun and moon having now become Zian, these luminaries are darkened, and vanish. In their stead two suns arise, which are not Nat. The one always succeeds the other, rising when it sets; so that there is no night, and the heat consequently becomes so intense, that all the lakes and torrents are dried up, and not the smallest vestige of a tree remains upon the surface of the earth. After a long interval, a third sun arises. Then are dried up the greatest rivers. A fourth sun succeeds, and two being now constantly above the horizon, even the seven great lakes disappear. A fifth sun arises, and dries up the sea. A sixth sun rends asunder this and the other 1,010,000 worlds, while from the rents are emitted smoke and flame. Finally, after a very long interval, a seventh sun appears, by which Mienmo, and all the inhabitants of the Nat, are consumed: and as in a lamp, when the wick and oil are exhausted, the flame goes out: so when every thing in this and the other 1,010,000 worlds is consumed, the fire of its own accord will die away. From the last great rain, to the final extinction of the fire, is one Affenchiekat."

"XXXVII. Such is the manner in which the world is destroyed by fire. When the destruction is produced
produced by water, or wind, the circumstances are very similar. For when water is to destroy a world, at first there fall very gentle showers, which by degrees increasing, at length become so prodigious, that each drop is 1000 juzana in magnitude. By such rain the abodes of men, and Nat, some of the Zian, and all the other million and ten thousand worlds, are entirely dissolved. When a world is destroyed by wind, the Nat having finished his warnings, a fine rain falls. But it is the last rain during that world. After 100,000 years the wind begins to blow, and gradually increases. At first it only raises sand, and small stones; but at length it whirls about immense rocks, and the summits of mountains. Then shaking the whole earth, it dissipates this and the others, with all the habitations of the Nat, Rupa, and Arupa, and scatters them through the immense extent of the skies.

The adjoining plan shews the order in which the Burmas suppose the successive worlds to be destroyed by fire, water, and wind.

From this plan it will appear, that out of sixty-four times, the world is fifty-six times destroyed by fire,
fire, seven times by water, and once only by wind; and that in the same order as in the plan. The perpendicular lines represent the times of destruction, and the horizontal ones the proportionate height to which each destruction reaches. Thus when fire is the agent it reaches to the height No. 1 and the five inferior Zian are destroyed. After a series of sixty-four destructions of the world, the last of which happens by wind, the first of the next series is occasioned by fire, and the same order is repeated. The world which immediately preceded this, was destroyed by fire, which reached to the height marked No. 4."

XXXVIII. The conceptions of the Burmas relative to the reproduction of a world now come to be explained. As we have seen, they allege three causes of destruction, fire, rain, and wind; but, according to them, the only cause of reproduction is rain. One Affenchiekat after the destruction of a world rain begins to fall like mustard seed, and increases by degrees till each drop becomes 1000 juzana in size. This rain fills all the space, which had been formerly occupied by the destroyed habitations, and even a greater: for by the wind it is gradually inspissated to the precise bulk of the former worlds. The rains, thus inspissated by the wind, form on their surface a crust, out of which arise, first, the habitations of the Zian, and then Mienmo, with all the abodes of the Nat who dwell near that mountain. The rain continuing to be inspissated, forms our earth, with the mountain Zetchiavala, and finally all the other 1,010,000; and all these are exactly in the same disposition, order, situation, and form, which they had in their former existence. These changes, both in the destruction and reproduction of worlds, take place, not by the influence of any creative power, but are occasioned by the power Damata, which is best translated by our word fate."
XXXIX. It farther remains to be explained, how the inhabitants of a new world are produced. The Burmas conceive, that on the surface of the newly-regenerated world a crust arises, having the taste and smell of butter. This smell reaching the nostrils of the Rupa and Zian, excites in these beings a desire to eat the crust. The end of their lives as superior beings having now arrived, they assume human bodies, but such as are shining and agile, and descend to occupy our earth, and the other 1,010,000, which are adjacent. These human beings for some time live on this preternatural food in tranquillity and happiness. But being afterwards seized with a desire and love for property, the nec- tarious crust disappears as a punishment for their crime; and their bodies being deprived of trans- parency and splendour, become dark and opaque. From this loss of light, dark night commences, and mankind are in the utmost perturbation: for as yet there is neither sun nor moon. Immediately how- ever the sun begins to appear in the east, dissipates the fears of man, and fills him with delight. Hence is the sun called Suria. But this joy is soon fol- lowed by new distress: for the sun performing round Mienmo his daily revolution, is soon hid by that mountain, and darkness again commences. Men are again afflicted by this new deprivation of light, and in perturbation exclaim, 'O that light, which came to illuminate the world, how quickly hath it vanish- ed!' While they are with ardent vows desiring another light, behold in the same eastern region, and in the beginning of night, the moon appears accom- panied by all the stars, and all mankind are wonder- fully delighted. Now they say to one another, 'How timely is this appearance! This luminary has appeared as if it had known our necessity; let us

* The souls destined to animate human bodies are by the Brahmins called Brama, which is evidently the same word with the Biamma, or first inhabitants of the earth, according to the Kitihs: for the Burma pronun- ciation makes no difference between k and i.
"us therefore call it Zanta*. This appearance of
the fun, moon, and stars, happened on a Sunday,
at the full moon of the month Taboun, which corre-
sponds partly with our March†: and at this very
instant of the fun's appearance, every thing on the
earth became such as it has ever since continued to
be. As when rice is boiled, some of its particles
will remain crude and undressed, while the remainder
is sufficiently boiled; so likewise, say the Burma
doctors, by the power of Damata, or fate, part of
the earth remains plain, part rises into mountains,
and part sinks into vallies."

"XL. In the foregoing paragraph it has been
mentioned, that on the surface of the earth there
had been generated a certain crust like butter, which
had disappeared, as soon as avarice, and the desire
of property, began among men. This crust pene-
trating the interior parts of the earth, and reaching
the great rock Sila-pathavy, converted its upper
parts into mud, earth, and dust. When the buty-
raceous crust descended into the earth, in its stead
sprung forth a certain climbing plant, which also
had the taste of butter. This plant continued to be
the common food of men till avarice again pre-
vailed; then it disappeared. In its place, from the
merit of certain good men, there came out of the
earth's bowels a kind of excellent rice already
cleared of its husk. Pots also filled with this rice
grew of their own accord; and men had only to
place them on a stone then common, which spon-
taneously emitted fire sufficient to boil the rice.
Every where also were to be found meats various
according to each person's desire.

"In the beginning, when men fed on the crust, and
on the climbing plant, the whole of this food was
changed into flesh and blood: but when they began
to eat rice, the groffer parts of that diet required

* The Pali word for necessity.  † See page 170 of this Volume.
"after digestion to be evacuated. In consequence, "the different canals, and organs, necessary in the "human body for evacuation, were of their own ac-
"cord generated. After having eaten rice, men began "to have luxurious desires, and the different organs "of sex appeared; for before that time mankind were "neither male nor female. Those who in a former "life had been males, now obtained the male organs "of sex; and those who had been women, obtained "female organs. When the difference of sex first "appeared, men contented themselves with mutual "lascivious glances: but afterwards they married. "Nevertheless there remained many virgins of great "virtue, and many holy men, who were called "Manussa Biamma. These neither practised agricul-
ture, nor any mechanical art; but only underwent "the great labour of making offerings and bestowing "alms. These men long observed inviolate chastity: "but when in the progress of time they perceived "their numbers daily lessening, many of them, in "order to raise up an offspring, contracted marriages; "and those who are now called Brahmens, are de-
scended from these last alliances. The Manussa "Biamma, who had retained their chastity, were very "indignant on hearing of this conduct in their com-
panions; and loathing much their depravity, ever "after held them in the utmost contempt, spit in their "faces, and abhorred to have any community with "them in eating, cloathing, or dwelling. From this, "say the Burma doctors, has arisen among the Brah-
mens the custom of not eating or washing with the "rest of mankind. But although the law of Godama "permits marriages; yet as, without the strict obser-
vance of celibacy, no person can arrive at Nieban, "so therefore all wise men have considered marriage "as a deed not of a perfect nature."

"XL I. The Biamma, who had married, by de-
"grees built houses, villages, and towns: but when "they began to multiply, there arose among them "contentions
"contentions and quarrels; for avarice prevailing, "every one consulted his own immediate interest, "without attending to the injury he might do to his "neighbour. At length these disputes came to be "determined by strength; and to put a stop to this "violence, it was determined in common council to "elect a prince, who should be able to reward accord- "ing to merit, and to punish according to the atrocity "of crimes. And a certain man being found amongst "them, who excelled the rest in stature and beauty, "and who had always been more observant of the "laws than the others, this person was created king "and lord of the earth: because he had been chosen "by common consent, he was called Mahasamata; "because he was made lord of the earth, he was called "Kattia; and because he punished according to the "laws, he was named Raza. From this Mahasama- "tta descended a series of forty-four kings, of "whom, according to the most learned of the Burmas, "the tenth was Godama*."

The account of the missionary here is not very clear. It is not evident, whether Godama, as descends from Mahasamata, was a Brahmen; or whether both princes are considered to be descended from the Biamma, who married before the Brahmens. If the former be the case, the Rāhāns make their god to be an apostate Brahmen: if the latter be their meaning, they suppose the Brahmens to be a sect of dissenters from their religion. I imagine, that little credit can be given to either opinion. The Rāhāns are evidently mistaken in their account of the origin of the Brahmens; for the aversion to eating in common with others does not originate with mankind, but with the Brahmens. I think it indeed probable, that this account has been lately framed by the Rāhāns, with a view of rendering odious to their followers a race of priests,

* Compare this account with the History of Cashmere, p. 163 of this Volume.
priests, so formidable among ignorant people from their hypocrisy, mortifications, and impudent pretensions to supernatural powers.

I THINK that Sir W. Jones and Paulinus have succeeded in proving, that the religion of the Brahmens is essentially the same with that of the Egyptians; and therefore I must think it probable, that the two religions had a common origin: but notwithstanding the etymological labours of the latter author, I must agree with the former, and with M. Anquetil du Perron, in thinking, that Egypt is the source from whence this worship has been spread over a great proportion of the world. In fact, during the most remote periods, to which history reaches, we find this religion universally established in Egypt. Later, but as soon as our knowledge extended to India, we find there established two sects: the Mogi, and the Samanians, or priests of Godama. We afterwards learn, that the Brahmens were a set of priests in India following nearly the same worship with those of Egypt. We find them about the time of Christ gaining a superiority over the worshippers of Bouddha; and about nine hundred years afterwards, we find them totally overthrowing his doctrine in its native country*. That the Vedas, which are commonly supposed to be the oldest books of the Brahmens, are inferior in antiquity to the time of Bouddha, is evident from the mention which they make of that personage. The strongest objection against this opinion of the Egyptian origin of the Brahmenical worship, appears to me to be the cofinography of the Brahmens, the same nearly with that of the Râhäns, and in my opinion evidently framed in the north of Hindustan. A solution of this difficulty may however be given. We may readily suppose the Brahmens to have been a colony of Egyptians, who formed their first establishments in the

* Page 165 of this Volume.
the vicinity of Bombay*; and by degrees engrafted their superstition on the ignorance of the Hindus, adapting the African deities and mythical philosophy to the Asiatic fables and heroes, and carefully introducing the Egyptian cast and ceremonies with all their dreadful consequences.

"The Burma doctors," continues the missionary, "admit of four classes of men: the first, descended from "Mahasamata, are princes; the second, descended "from the Manuṣa Biamma, who married, are the "Brahmens; the third, descended from such men as "married before the Manuṣa Biamma, are the Sathe "or rich: in the fourth class, called Suchive, are in- "cluded all other men, merchants, artificers, labour- "ers, and the like."

This opinion might be supposed to imply, that the sect of Bouddha admitted of cast, in a similar manner with that of the Brahmens; but as far as relates to its followers in the Burma empire, and in Siam, I can assure the reader, that so cruel and so abominable a distinction is utterly unknown, except by report, and from the example of the Hindus settled in those countries. At what time then was the doctrine of cast established in Hindustan? Pliny is the only antient author to whom on this subject I can at present refer. He mentions a division of ranks among various Indian nations, which he calls *vita multipartita*: but from what he says, it would not appear to have been universal at the time he received his intelligence: neither is it by any means clear, that his *vita multipartita* means cast. It is to be observed, that all Roman citizens followed nearly the same manner of life: they were soldiers and statesmen; and when not employed in either of these

* The images in the cave at Elephanta appear to me, now that I am acquainted with the subject, evidently to be those of the gods of the Brahmens. I well remember, when I viewed them, (although then quite unacquainted with the controversies concerning their origin), that I was struck with the African appearance of their hair and features; and conceived them to have been the work of Sesostiris, as I had imbibed the vulgar idea, that they were not the idols of the Brahmens.
these capacities, they were all cultivators of the land. To them therefore a distinction of professions in the citizens of a state would appear strange: and I am apt to think, that the *vita multipartita* of Pliny more resembles the division of ranks and professions among the Burmas, or in modern Europe, than it does the cast of the Brahmens. The passage I allude to is, "Namque vita mitioribus populis Indorum multipartita *degitur. Alii tellurem exercent, militiam alii ca-* pessunt, merces alii suas evexit, respublicas optimi *ditissimi temperant, judicia reddunt, regibus affident. *Quantum genus celebratæ illic, et prope in religionem, *versa sapientiæ deditum, voluntaria semper morte vi-* tam, accenso prius rogo, finit*. Unum super hae est "femiferum, ac plenum laboris immens?, et quo supra *dicit continentur, venandi elephantes domandique, *Iis arant, ii? invictum, hae maxime noverc pecu-* aria: ii? militant dimicantque pro finibus." It is to be observed, that this description neither agrees well with the present divisions of the different casts, nor does it call the learned Brahmens; on the contrary, Pliny speaks of the *Brachmanæ* not as a class or order in society, but as a nation, or as a name common to many nations. He mentions, that Seneca had attempted to procure the names of all the people inhabiting India, and had actually heard of one hundred and eighteen nations. The most considerable of these he afterwards enumerates: "Gentes, quas "memorare non pignet, Ismari, Cosyri, Izgi, et per *iugæ Chistiotosagi, multarumque gentium cognomen *Brachmanæ quorum Maccocalingæ, flumina Pumas et *Caines (quod in Gangem influit) ambo navigabilia." This

* It is to be observed, that this manner of ending life, attributed to the learned of ancient India, more resembles that in use among the priests of Pegu (Louberé's *Relation du Siam*) than it does that recommended by the Brahmens, who according to Abul Fazil (Ayeen Akberry) think it meritorious to terminate life by cutting the throat at the confluence of the *Ganges* and *Jumna*, or by exposing themselves to the alligators at the mouth of the holy river.

This circumstance surprizes me, as the general recollection of my reading induces me to believe, that the Brahmens, as a religious sect, had been established in India before the time of Alexander, from whose expedition Pliny's knowledge of the northern parts of Hindustan is chiefly derived. To those who have an opportunity, I leave it to determine the time when Brahmen came to be the name applied to the religious of India. With Pliny it seems to be analogous to the Brahmens of Kustup*, or perhaps the Bimama of the Rōhāṇs†. Mr. Harington has suggested to me, since I wrote the above passage, that all the countries in which Bimana was worshipped might be called Brahmenical, an opinion which I think not improbable. If it be just, it will shew the progress made by the Brahmens in India in the fourth century before the birth of Christ.

"XLII. It being admitted, that all mankind are "the offspring of the same stock, namely of the Bimana, who descended from the abodes of the Rupa; "a certain Burma doctor asks, why there is not the "same language among all nations; and whence arise "fes that variety of manners, religions, complexions, "and features, so observable among the inhabitants "of this earth? This same doctor thinks he answers "this question, by saying that the first inhabitants of "the world, after having greatly multiplied by mar- "riage, were forced to emigrate into various parts of "the earth; and as in these the climate, air, water, "natural productions, and temperature, are extremely "different, such circumstances could not have failed "to produce an effect on the manners, religion, and "appearance, of those who were under their influ- "ence. For if in one kingdom the inhabitants vary "in stature and colour, how much more evident must "this difference be amongst the inhabitants of remote "countries? And as children descended from the "same parents are called by different names; so of "the

* Page 164 of this Volume. † Pages 245 & 248 of this Volume.
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the descendants of the Biamma, some are called "Burmas, some Cuffays, some Peguefe, and some Siammese. He also alleges, that, according to a person's lot of good or evil deeds, he is born either a Burma, or a Siammese, or a European. It sometimes also happens, that he who was at first born of an ignoble family, shall afterwards be born of an illustrious race: but this not from his original lot of nativity, but from some accidental good works. For diversity of names the same author thus accounts. It may so happen, says he, that the same person, according to the different actions he may have performed, may be considered in different points of view, and thus obtain different appellations: and this he confirms by the example of Go-

dama, who, according to his various attributes and excellencies, is called by various names.

The same author inquires, by what power and cause the various kinds of trees and herbs have appeared in the world? He supposes them to have arisen from the seeds of the antecedent world contained in that rain by which the new earth was reproduced. The same however he does not venture to affirm of the mines of gold, silver, and precious stones, which he alleges have not from the beginning existed in the world, but have originated from the virtues of good men. Thus when just and upright princes reign on earth, and when many men are celebrated for sanctity and virtue, then the tree Padeza appears; from the heavens showers of gold and precious stones descend; in the bowels of the earth many mines of gold and silver are discovered; the sea also throws up on its shores various kinds of riches, and whatever is fown comes to perfection. On the contrary, when unjust kings have reigned, or when men have neglected the laws, not only have new riches remained undiscovered, but all the old wealth has disappeared; the mines of gold and silver have been exhausted; and
and the fruits of the earth have become of such a noxious quality, as to induce upon mankind misfortune, disease, and pestilence.”

Such are the general doctrines of the sect of Bouddha, as extracted from the writings of the Râhâns by Sancermano; doctrines which, although intended to lead mankind to the performance of good works, are involved in the most puerile and absurd fables.

The religion of the Burmas is singular, as exhibiting a nation considerably advanced from the rudeness of savage nature, and in all the actions of life much under the influence of religious opinions, and yet ignorant of a Supreme Being, the creator and preserver of the universe. The system of morals however recommended by these fables, is perhaps as good as that held forth by any of the religious doctrines prevailing among mankind. The motives also by which these fables excite to good works, unite the temporal nature of the Jewish law to the future expectations of the Christian dispensation: while having adapted the nature of the rewards and punishments to the conception of our present faculties, they have all the power of the Mohamedan paradise; and having proportioned these punishments and rewards to the extent of virtue or vice, they posses the justice of the Roman purgatory, but without giving to priests the dangerous power of curtailing its duration. Bouddha has no doubt given to the bestowing alms on the clergy a conspicuous place among the virtues: but his clergy for support are entirely dependant on these alms; as they have not ventured to propose any flated, laisting, or accumulating property, being annexed to their order; nor have they assumed to themselves any rank or power in the management of secular affairs. Except this elevation of an inferior virtue to the rank of an important duty, and the merit which we shall find given to the ceremony of
of pouring forth water on certain occasions, there is perhaps no considerable objection to any of the morality recommended by Godama, unless it be his considering it criminal to put any animal to death for the use of man*; and his representing celibacy as a kind of virtue, or at least as a more perfect state than marriage: an idea, though common to some of the authors of prevailing religions, yet certainly productive of much misery, and of the worst consequences. It must however be confessed, that the practice of morality among the Burmas is by no means so correct, as might be perhaps expected among a people whose religious opinions have such an apparent tendency to virtue. In particular, an almost total want of veracity, and a most insatiable cruelty in their wars and punishments, are observable among them on the slightest acquaintance.

Having now considered in a general manner the religion and science of the Burmas, I must descend somewhat more to particulars: and in giving an account of their faith, I cannot follow a better guide than the treatise of the Zarado. It will give the reader not only a faithful abridgment of the religious doctrine of the Rähāns, but will also show him the progress made by the best informed priests of the country in the art of composition and instruction.

But as a preface to this treatise, I must here insert some observations on the history and name of the god.

The author of the Alphabetum Tibetanum supposed Bouddha to have been the same with the Jesus of the Manichæans; and father Paulinus, in his triumph over this absurdity, denies that any such person ever existed. Entirely neglecting the authority of the numerous

* The worshippers of Godama do not look on any animal food as unclean: it is only the depriving it of life which they regard as criminal. Accordingly they eat all manner of carrion, and many disgusting reptiles are their favourite food.
numerous sects of Bouddha, who all suppose him to have really lived, and to have been an Indian prince, the learned Carmelite from some coincident attributes believes Bouddha and Hermes to have been the same. He supposes them, as well as all the other gods of the Greeks and Brahmens, not to have been real beings, but personifications of the elements and heavenly bodies. In applying this supposition to Bouddha, as worshipped by the Rāhāns, he quite overlooks the essential difference of their making Godama an only God, and that the doctrine of personification necessarily implies polytheism, a system of belief held in abhorrence by these priests. I think it a more probable opinion, when the Brahmens introduced their doctrine into Hinduism, that they could not venture to deny the divinity of the god of the country; but on comparing his attributes with those of their different gods, that they alleged him to be the same with their Toth; and by adopting him and his titles into the list of their deities, and many of the prejudices of his followers into their capacious system, they greatly facilitated the progress of their doctrine. It is true, that the various accounts of Godama, said to be given in the legends of the different nations following his religion, agree so little together, that they can hardly be made matter of historical evidence. But many of these differences may have arisen from the mistakes of travelers; and it is only by procuring faithful translations of the different legends, that we can be enabled to determine what credit is due to their contents. In the meantime I must say, that I know of no plausible reason for believing that Godama did not exist, and was not an Indian prince, as his followers universally allege. The father, although a catholick, seems to found his objection on the supposition, that mankind could never be so absurd as for any length of time to worship a man.* But the whole difficulty of Paulinus is removed

removed by the doctrine of Godama. His followers are, strictly speaking, atheists, as they suppose everything to arise from fate: and their gods are merely men, who by their virtue acquire supreme happiness, and by their wisdom become entitled to impose a law on all living beings. If the Bouddha of the Rähans were merely the genius of the planet Mercury, as Paulinus so violently urges,* why do his followers place his abode or palace in the lowest habitation of Nat, among beings equally liable with mankind to old age, misery, change, and gravity? That the Egyptian religion was allegorical, I think, the learned father, with many other writers, have rendered extremely probable; and consequently I think that the doctrine of the Brahmens has in a considerable measure the same source: but I see no reason from thence to suppose, that Bouddha, Rama, Kishen, and other gods of India, may not have existed as men: for I have already stated it as probable, when the Brahmens arrived in India, that they adapted their own religious doctrine to the heroes and fabulous history of the country. Neither do I think it altogether impossible, that even in Egypt the priests, who at first introduced the worship of the elements and heavenly bodies, afterwards applied to these deities the names of such persons as were most celebrated among their countrymen, and intermingling the legendary tales concerning these personages with their own mystical philosophy, produced that absurd mass of theology, by which a great part of mankind have been so long subjugated.

Different learned men have supposed Bouddha to have been the same with Noah, Moses, or Siphoas, thirty-fifth king of Egypt: but as I have not at present access to the works of Huet, Vossius, or Tourmont, I do not know on what reasons such suppositions have been formed. Sir W. Jones supposed Bouddha to have been the same with Sesac or Sesostris.

Sesostris, king of Egypt, "Who by conquest spread a new system of religion and philosophy, from the "Nile to the Ganges, about 1,000 years before "Christ*." The affinity of the religion of Egypt with the present superstition of Hindustan, and the fatal resemblance of the words Sesac and Sakya, one of the names of Godama, seem to have given rise to this supposition. In my opinion, however, no two religions can be well more different, than that of the Egyptian polytheist, and that of the Burma unitarian. Sesac or Sesostris is indeed placed by antiquarians at the time to which the learned judge alludes: but I shall hereafter have occasion to show, that, according to the most probable accounts, the origin of the religion of Godama ought to be referred to a much later period†. That the religion of the Brahmens was introduced from Egypt, I have already mentioned as an opinion highly probable‡: but I suspect that this happened by no means so early as the time of Sesostris, whose object in his military expeditions appears rather to have been plunder, and the capture of slaves, than the propagation of religion or philosophy. The persecution of the Egyptian priests by Cambyses is a more likely period for any very extensive emigration into India; at the same time it is not improbable, that the Egyptians, who before this traded to India, had previously communicated some knowledge of their science to the Hindus.

It must be observed that the god, of whose doctrine we are now going to give an explanation, has a great variety of names, which are apt to produce much confusion. Godama or Kodama is the most common appellation among his worshippers in India beyond the Ganges. It seems also to be common among the Hindus, and by Sir William Jones copying I suppose from the Sanscrit, is written Gotamas.|| This name

* Aziatick Researches, II, 380.
† See note † in page 265 of this volume.
‡ See page 148 of this volume.
|| Aziatick Researches, IV, 170.
name Paulinus informing us may be written Godama or Gaudama, and literally signifies cow-herd, but metaphorically king. It has however been mentioned to me, on the authority of a pundit belonging to our supreme native court in Bengal, that the meaning of Godama is eminently wise, a sage. Somona, the name prefixed to this appellation by M. de la Loubere, signifies that he had adopted the dress of a Rāhān, as I was informed by Mue-daung Seitagio, an intelligent Siammese painter at Amarapura. The same circumstance is implied by Bura-zayndu, one of the most common titles bestowed on him in the Burma empire: for his images are almost always in the dress of a Rāhān. Many other appellations are given to Godama from the postures in which he is represented in his various images. Thus a famous image at Pougan is named Ananda, which signifies plenty, from its supposed efficacy in producing that blessing.

In the Pali language, and among the Cingalese, a common name for this divinity is Bouddha. This Mr. Chambers writes Buddout, Paulinus Budha, and from these two authors I have collected the following corruptions of that name. BuDDA, or Butta, of Beausobre and Bochart, Bod of the Arabians, Bodda of Edrisi, Butta of Clemens Alexandrinus, and Baouth of M. Gentil. This name is said to be an appellation expressive of wisdom. I can readily agree with these two learned men, that the Pout of the Siammese, Pout, Pott, Poti, Pot of the natives of Thibet, and the But of the Cochinchinese, may also be corruptions of Bouddha. The Siammese painter told me, that the most common name for Godama among his countrymen is Pouttee Sat, which he interpreted into Buraloun, a common appellation among the Burmas. Among these indeed I very rarely heard Bouddha used, probably because Buraloun has the

the same meaning. Mr. Chambers, following M. Gentil, and followed by Paulinus, conceives the Fo or Fohi of the Chinese to be also a corruption of Bouddha. The etymology is here so forced, that I do not think it merits great attention: yet I allow it to be a probable opinion, although not completely established, that Fo and Bouddha are the same god.* The derivation of Taautos, Toth, or Touth, the Egyptian name for Hermes, from the same word Bouddha, † seems to me perfectly fanciful: and I must entirely dissent even from the rational Mr. Chambers, when he supposes Bouddha to be the same with the Woden of the Scandinavians. No two religions surely can be more totally different; nor can I conceive it to be a sufficient proof of a common origin, that the same day of the week is called after the two gods. No circumstance indeed seems to have occasioned more mistakes among the antiquarians, than from one or two coincident attributes to suppose two divinities of different nations to be the same: an error adopted by all the Greeks and Romans, whether from respect to their gods, or from national vanity.

A considerable degree of confusion is to be found in the various accounts of the religion of the Chinese. Grosier, the latest author on the subject, with whom I have met, seems by no means to have had good information. I know well that some of the Brahmenical gods are worshipped in China, having seen their images in that great temple opposite to Canton, which was the palace of the last native princes of the Chinese empire. I have lately seen some elegant drawings of the Chinese gods, belonging to the Reverend Mr. Brown, of Calcutta: and as far as I can trust to my memory, they appear to be very exact representations. Although the Chinese have given to these idols their own features, and dress, with new names, yet there can be no doubt of their being the same with the gods of the Brahmens. Among them You-loe-fat, the god of wisdom,

* See note † in page 268 of this volume.
† Paulinus Mus. Borg. page 73.
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wisdom, has a very strong resemblance to the images of Godama; and perhaps the Chinese ambassadors, and their suite, whom I saw at Amarapura worshipping the images of Bouddha, conceived the two deities to be the same. When in the first century of the Christian era the superstition of a Chinese monarch had introduced into his dominions the religion of the Brahmens, his successors were too just to hinder their subjects from worshipping what gods they thought proper; but they were too wise to admit the Brahmens as priests, or to tolerate their intriguing spirit, or their detestable system of government: a conduct entirely similar to that wisely adopted towards the Jesuits by the late emperor Yong-tching. On the whole I am inclined to believe, that the religion most commonly profess'd by the vulgar Chinese, has nearly the same affinity to that of the Brahmens, which the sect of quakers has to our established church. It is true, that they have Bonzes, or regular priests: but these are neither Brahmens, nor are they acknowledged by the Rāhāns to be legitimate priests of Bouddha. But the worship of these Brahmenical gods, as communicated to the Chinese, is quite distinct from that of Godama. Whether the god Fo be one of these gods of the Brahmens, or whether he be Shāka; or whether all the three be distinct, I will not presume, for want of sufficient information, to assert: but there is a great probability, that a very considerable sect among the Chinese worship Godama under the name of Shāka, or, as the Portuguese write it, XACA.

The sect of Bouddha is said by some to have been introduced into China in the year of our era 63*. Others allege, that this event did not happen till the year 519: and that the apostle was a certain Darma, third son of an Indian king, the twenty-eighth in descent from Shāka, or as, the Dutch write, Sjak.

SJAKA.* The name SHAKA Sir William Jones wrote SAKYA, and Paulinus ShakyA. It signifies, according to that learned etymologist, the cunning, the god of good and bad fortune †. From China the religion of Shaka seems to have spread to Japan, Tonquin, Cochinchina, and the most remote parts of Tartary.

It must however be observed, that the religion of Cochinchina, described by Boiret ‡ as that of But, That-dalna, Nhinh-nhuc or Thica Mauni-phut, and alleged to have been introduced from Ceylon in the reign of the Chinese emperor Minh-de, seems to differ in many essential circumstances from the doctrine of the Burma Rāhāns. The Cochinchinese are alleged to suppose, that But created the heavens, the earth, and indeed the whole universe: and from Boiret's mentioning that they adore But as the principal deity, we may infer, that they allow of other gods. The priests of the Cochinchinese are alleged to be pretenders to the arts of magic, enchantment and necromancy, and to implore the divinity to assist them in such deceptions. In these circumstances the worship of But in Cochinchina differs from that of Bouddha in Ava; and I suspect, that there, as well as in China, the prevailing vulgar religion is the worship of the gods of the Brahmens freed from the doctrine of calf; and that Bouddha is with them the favourite god, as different members of the Egyptian theocracy in different places met with very different degrees of respect. Still however the accounts I have seen of the vulgar religion in these eastern regions are very unsatisfactory; and the hints given us by Alexander of Rhodes, || concerning the doctrine of Thicca in Tonkin and Cochinchina, bear

* Kämpfær, Amam. Exot. 608, as quoted in Harris's voy.
ages, 1. 543.
† Mus. Borg. pag. 80. ‡ Paulinus Mus. Borg. pag. 89 et seq.
|| Dictionarium Anamiticum Rome, 1651, page 761.
bear a much stronger resemblance to the worship of the Rāhāns, than the accounts of Boiret.

These various names applied to the god, of whom I am treating, are all appellatives, expressing his various attributes, as we use the terms, almighty, the most high, and other similar phrases, to denote the Creator of the universe. Many other apppellations of Boudhā may be seen in Paulinus, who copies them from the Amarafinha, a work of the Hindus; but as I do not know, that these titles are ever bestowed on Godama by those who worship him as the only god, I shall forbear to enumerate them.

The name by which this divinity was called on earth, was probably Dherma or Dharma rajah; although it must be observed, that among the Hindus it has never been customary to call any prince by his proper name. This custom has been communicated to the Burmas with such strength, that it is almost impossible to learn the name of any prince during his reign. His titles only can lawfully be mentioned; and the law is enforced with such rigour, that Burmas, even in Calcutta, shudder when requested to mention the dreadful name; nor am I satisfied, that either Captain Symes, or I, could ever procure the real name of the reigning monarch. Dherma rajah signifies, according to Paulinus, the virtuous or beneficent king,* and may be only a title bestowed on that prince, whose real name, as his reign still continues, it may not be lawful to mention. This etymologist also alleges, that the name Hermes must be derived from the Sanscrit word Dherma, signifying virtue or beneficence: although interpreter was imagined to be the meaning of this word by the Greeks, as the father probably would say, owing to their ignorance of the Sanscradam, as he has chosen to name the language of the Hindus. His opinion however is supported with ingenuity; and the word Turm, which Winckelmann luckily found upon two old pots in Italy, is by no means

* Mus. Borg. page 75.
means a weak support to an etymological reasoner. Having thus endeavoured to collect the various appellations bestowed on the god of the Burmas, I proceed with the translation of

A SHORT VIEW OF THE RELIGION OF GODAMA.*

"A catholick bishop, residing at Ava sometime ago, asked the chief Rāhān, called Zaradobura, to give him some short treatise, which would explain the heads of the law taught by Godama. The Zarado, willing to satisfy the bishop, wrote for his use the following treatise:

The gods who have appeared in this present world, and who have obtained the perfect state Nieban, are four; Chauchasam, Gonagom, Gaspa, and Godama.

Q. Of which of these gods ought the law at present to be followed?

A. Of the god Godama.

Q. Where is the god Godama?

A. Godama, at the age of thirty-five years, having attained divinity, preached his law for forty-five years, and brought salvation to all living beings. At eighty years of age he obtained Nieban, and this happened 2362 years ago.† Then Godama said, After I shall have departed from this earth, I will preserve my law and disciples.

* I have little doubt, but that the author of this treatise was the same Zarado who wrote the Compendium legis Barmanorum, of which Paulinus gives us an account. The treatise however translated by Sangermano does not contain several of the circumstances said to be mentioned in that of the museum of the liberal and learned cardinal Borgia.

† I am not certain whether the original means, that Godama died 2362 years before the period at which the bishop received the book from the Zarado; or whether, in translating it, Father Sangermano reduced the time to the year 1795, in which I saw him: I believe the latter to be the case, although the difference will not be great, as the bishop died at Ava a few years ago. Much reasoning of Sir William Jones, on the age in which Bouddha lived, may be seen in the Asiatick Researches,
"pleas for five thousand years: and he commanded
"that his images and relics should be worshipped,
"which has accordingly been ever since done.

"Q. In saying that Godama obtained Nieban, what
"is understood by that word?

"A. When a person is no longer subject to any of the
"following miseries, namely, to weight, old age,
"disease, and death, then he is said to have ob-
tained Nieban. No thing, no place, can give us
"an adequate idea of Nieban: we can only say,
"that to be free from the four abovementioned
"miseries, and to obtain salvation, is Nieban. In
"the same manner, as when any person labouring
"under a severe disease, recovers by the assistance
"of medicine, we say he has obtained health: but
"if any person wishes to know the manner, or
"cause of his thus obtaining health, it can only
"be answered, that to be restored to health signifies
"no more than to be recovered from disease. In
"the same manner only can we speak of Nieban,
"and after this manner Godama taught.

"Q. Is not Godama the only true god on the face
"of this earth?

"A. Godama

(II, page 121, and the following). It would appear by this, that the
Brahmens differ some thousands of years in their accounts of the time of
his appearance. From the immense variations of time in the chronology of
the Brahmens, no truth can rationally be put in their account. The opinion
of the Chineses states Shaka to have lived 1028 years before Christ;
but as this opinion can only be founded on the authority of the Indians,
who introduced the worship of Bouddha into China, it proves no more
than the Indian ideas at the time: otherwise it would deserve much credit.
Georgi, from the writings of Thibet, reduces the era of Bouddha to the
year 959 before Christ. If I am right in my conjecture, the Zarabo's 2362 Burma years, equal to nearly 2341 of the Julian reckoning,
would place the death of Godama 546 years before Christ. The
Stamnese, whose vulgar era commences with the death of Godama, make
that event to have happened in the year 544, (Relation du Royame de
Siam, par M. de la Louvere. II, 160.) within two years of the
Zarado's estimate. The Cingales, according to Mr. Harington,
make the era of Godama's death 542 years before Christ. Paulinus,
calculating from the date given in the Borgian manuscript, reduces the
Stamnese period four years: and in all such differences of opinion, the
datest to follow is the latest date, as most likely to approach the truth.
A. Godama is the only true and pure god, who
knows the four laws called Sizza, and who can
bestow Nieban. In the same manner as on the
destruction of a kingdom many arise, who aspire
to the throne, and who assume the royal insignia;
so when the time fixed for the duration of the
law preceding Godama had expired, and it had
been prophesied for a thousand years, that a new
god was about to appear, six men before the
coming of Godama pretended, that they were
gods, and each of them was followed by five
hundred disciples.

Q. Did those false gods preach no doctrine?
A. They did preach: but that, which they taught,
was false.

Q. What did they teach?
A. One taught, that the cause of all the good and
evil, which happen in the world, of poverty and
wealth, of nobility and want of rank, was a cer-
tain superior Nat of the woods, who on this
account ought to be worshipped by mankind.

A second taught, that after death men were by no
means changed into animals, and that animals on
being slain were not changed into men: but that
after death men were always born men, and
animals born animals*.

A third denied the proper Nieban, and asserted, that
all living beings had their beginning in their mo-
ther's womb, and would have their end in death:
and that there is no other Nieban, but this
death†.

A fourth

* This was probably the doctrine adopted by the Burmas before they
were converted to the religion of Buddha: for it is yet retained by
the Karayn, a rude tribe still occupying many of the woods in the Pegu
and Burma kingdoms.

† Grosier, in his account of the Chinese religion, (II, 222,) has
either confounded this heretical Nieban with the true doctrine of the
Râhâns, or else the religion he has described as that of Fo, must be dif-
ferent from that of Godama. In that work also many detestable prac-
tices are ascribed to the Chinese Bonzes, which, so far as I could learn,
were entirely unknown to the Râhâns; and also many foolish and gross
superstitions, and penances, which they never practise.
A fourth taught, that all living things neither had 

a beginning, nor would have an end: and that 

every thing which happens arises from a fortui-

tous and blind fate. He denied the lot of good 

and evil deeds, which, according to the law of 

Godama, is the efficient cause of all the good and 

evil that happen to living beings.

The fifth taught, that Nieban consists in nothing 

more than the life of certain Nat and Biamma, 

who live for the whole duration of a world. 

He asserted, that the chief good works are to 

honour our parents, to endure the heat of the 

fun or of the fire, and to support hunger; that 

there is no crime in killing animals. He said, 

that such as performed these good works, would 

be rewarded in a future life; and that such as 

did the contrary, would be punished.

The last taught, that there existed a being, who had 

created the world, and all things which are 

therein, and that this being only is worthy to be 

adored*

* Here the Zarado probably alludes to Devadat, as the Rähüns 
call Jesus Christ. The Siamime painter before-mentioned told me, 
that Devadat, or, as he pronounced it, Tevedat, was the god of the 
Pyegye, or of Britain; and he conceived, that it is he who, by opposing 
the good intentions of Godama, produces all the evil in the world. I 
I am inclined to believe, that the legend of Tevedat, of which 
M. Loubere has given us a translation, has been composed since the 
arrival of the Portuguese in India, in order to prevent the propagation of 
their religion, so well adapted, by its splendour and mysteries, to gain the 
belief of an ignorant people. Some antiquarians have thought, that much 
light may be thrown on the history of Hindustan by the legends of the 
gods as delivered by the Brahmens: but much caution would be necessary, 
even when for such a purpose we made use of the less miraculous legends 
of the Burma heroes, who are the same with the gods of the Brahmens: 
for it is reasonably to be suspected, when they want to serve any particular 
purpose, that both Rähüns and Brahmens bring out occasionally either a 
new legend, or an addition to an old one. In so doing, the Brahmens are 
indeed perfectly safe; for if ever there were any historical writings among 
the Hindus, they have long since been destroyed. The arguments of 
Paulinus (Mus. Borg. pag. 121 et seq.) on this subject deserve much 
attention, although to many he will appear to have pushed his conclusions 
further than his arguments will warrant. It is to be regretted, that the 
vigilant zeal of the father should have induced him to forget the civility 
due to adversaries, and to be uncandid in attributing improper motives to 
those, who happen to differ from him in opinion.
Now all these false gods or deiti taught such things, not because they believed them to be true: but in order to answer questions which had been proposed to them, they said whatever at the time came into their minds.

Q. When the true god Godama appeared, did not the false gods renounce their doctrines?

A. Some of them did: but others still continue obstinate: and with all these Godama fought in the kingdom Sauliti near the tree Manche: what greater miracle can be performed?

Q. In this conflict who gained the superiority?

A. Godama did: on which account the ringleader of the false gods was so ashamed, that tying a pot about his neck, he threw himself into a river, and was drowned.

Q. The master being dead, did his followers renounce his doctrine?

A. Some of them renounced his doctrine: but others did not. It is easy with your nails, or with Megnap, to take a thorn out of your feet or hands: but it is very difficult to pluck forth from the minds of men the doctrines of false gods.

Q. Cannot this be done by any means?

A. The warnings of just men, like the Megnap, can only effect it.

Q. What are the warnings and doctrines of these just men?

A. In the first place, whoever kills animals, or commits the other wicked actions, which are contrary to the five commandments, is liable to the

* This conflict of Godama with Devadat, and the other deiti, Paulinus imagines to be the same with the doctrine of the Magi concerning Ormuzed and Arimanius (Mus. Borg. pag. 51): which appears to me to be nearly as improbable, as the opinion of the Râhâns concerning the identity of Jesus Christ and Devedat. In the Titans of the Grecians, the father also discovers this doctrine of the Magi. However these same Titans, with perhaps as much probability, are alleged by Governor Pownel to have been a hord of savages from the north, under the command of their Hetman Briarcus.

† The instrument with which the Burmas pluck their beards.
"lot of evil deeds: but whoever bestows alms, "practises the ten virtues, and adores god and the "Rāhāns, will obtain the lot of good deeds. In "the second place, in the same manner as the "shadow and body are inseparable, so during all "the successive destructions of future worlds, these "lots of good and evil inseparably follow all living "beings, and are the sufficient causes of all the "good and evil, by which these beings are effected: "from these lots beings are born noble, or ignoble; "from them men pass into animals, or into Nat. "This is the doctrine revealed by Godama, and "it is called the doctrine of Sammadeitti. This "doctrine is the great Megnap, or nail, which com- "pletely plucks forth from the minds of men the "thorns of the deitti. O ye masters and wise men "of all nations, Armenians, English, French, and "Dutch, proclaim it to all living beings!

"Q. Did these six false gods, who taught that it is "good to honour our parents and teachers, to "suffer heat, cold, and the like, receive no benefit "by the performance of such actions?

"A. As when any one eats bitter fruit, which he "supposes to be sweet, in the act of eating he does "not find it sweet, but on the contrary bitter: or "as when any one drinks mortal poison, thinking "it to be a valuable medicine, his so thinking "does not prevent his death: so it is with these "six deitti, who pretended to be gods, and did not "abjure their doctrine; although they endured "hunger, thirst, heat, and cold, thinking such to "be good, yet have they received no advantage, "but have passed into the infernal regions, where "they suffer many evils and tortures. Therefore, "O ye teachers of the English, Armenians, Dutch, "and others, and ye the wise men of all nations, "take heed to the above example, and like lights "in a dark place teach others, who wander in the "errors of the deitti, so that they may escape from "these, as from an inhospitable and desert path, "and arrive at the ample and straight road of the "true doctrine and faith. "Q. What
Q. What is the doctrine, and law, which Godama delivered to be observed by all men?

A. It consists chiefly in observing the five commandments, and in abstaining from the ten sins.

Q. What are the five commandments?

A. I, From the meanest insect up to man, thou shalt kill no animal whatever. II, Thou shalt not steal. III, Thou shalt not violate the wife or concubine of another. IV, Thou shalt tell nothing false. V, Thou shalt drink neither wine, nor any thing that will intoxicate; thou shalt not eat opium, nor other inebriating drug.

Whoever keeps these five commandments, during all successive transmigrations, shall either be born a nobleman, or Nat; and shall not be liable to poverty, nor to other misfortunes, and calamities.

Q. What are the ten sins?

A. These are called by the common appellation Duzzaraik, and are divided into three classes. In the first class are comprehended the works which are contrary to the commandments; namely, I, the killing of animals; II, theft; III, adultery. In the second class are contained; IV, falsehood; V, discord; VI, harsh and indignant language; VII, idle and superfluous talk. To the third class belong, VIII, the coveting of your neighbours goods; IX. envy, and the desire of your neighbours death, or misfortune; X, the following of the doctrine of false gods.

He who abstains from these sins, is said to observe Sila: and every one who observes Sila in all successive transmigrations, will continually increase in virtue, till at length he will become worthy of beholding a god, of hearing his great voice; and thus he will obtain Nieban, and be exempted from the four known miseries, namely, weight, old age, disease, and death. We must also believe, that Godama taught, if we observe his laws, we shall see the other gods, who are to arise after him.
Q. Besides these already mentioned, are there any other good works which ought to be practised?
A. There are. One good work is called Dana; a second is called Bavana.
Q. In what consists Dana?
A. Dana consists in giving alms, particularly to the Ruhuns.
Q. In what consists Bavana?
A. It consists in thoughtfully pronouncing these three words, Aneizza, Doccha, and Anatta. By the word Aneizza is understood, that he who pronounces it, recollects, that by his particular situation he is liable to vicissitudes: by the word Doccha is understood, that by the same situation he is liable to misfortune; and by the word Anatta, that it is not in his power to exempt himself from being liable to change and to misfortune. Whoever dies without having observed the Sila, Dana, and Bavana, will certainly pass into one of the infernal states, and will become a Nirca, a Prietta, or some animal.

Every one, who dies without the merit of some good action, performed during his life, may be compared to him, who, without a store of provisions, travels through inhospitable deserts: to him, who without arms, penetrates into a place abounding in robbers or wild beasts: to him finally, who in a small and leaky boat, attempts to pass a vast, tempestuous, and whirling river.

Moreover whoever, either priest or layman, gives up himself to the five carnal works, or to the pleasures received by the five senses, who does not observe the five commandments, and who does not abstain from the ten sins called Duzzaraik, is like a moth, which attracted by the shining of a candle, flutters round the light, till it perishes in the flame: or he is like a person, who seeing a spot of honey on a sword, is unmindful of the edge, and in licking the honey cuts his tongue, and dies: or he is like a bird, who, eager for the bait
bait, does not perceive the springe laid for it: or
like a flag, who running after the female, observes
not the arms nor the snares of the hunter. This
perfon not attending to future danger, but solicited
by the five carnal delights, will either pass to the
infernal regions, or will transmigrate into an animal.
By such similitudes did Godama teach.
Revolving these things in your minds, O ye
English, Dutch, Armenians, and others, adore Go-
dama the true god; adore also his law, and his
priests; be solicitous in giving alms, in the obser-
vance of Sila, and in performing Bavana. But a
true and legitimate priest of Godama is not to be
found except in this empire*, or in the island of
Ceylon: and you, O bishop, have obtained a great lot,
who have been thought worthy, although born in
one of the small islands depending on Zabudiba, to
come hither, and to hear the truth of the divine
law. This book, which I now give you, is more
estimable than gold and silver, than diamonds and
precious stones: and I exhort all English, Dutch,
Armenians, and others, faithfully to transcribe its
contents, and diligently to act according to the pre-
cepts therein contained.
The title assumed by the writer of the above
treatise was I Atuli Zarado, great-master of the
king of the nine provinces of the Shan, of the
province of Cuffoy, of the three provinces of Giun
Yun and Han, of the three provinces of Pegu, and
of the seven provinces of Burmas: prince of the
golden umbrella, of the palace of the sun and moon;
and also supreme lord of the white elephant, of the
red elephant, of the black elephant, &c. &c. &c.

OF THE PRIESTHOOD.
These titles of the chief priest of the country lead
me to describe that order of men, so intimately con-
ected with religion and learning.

* Siam was then subject to the Burmas.
All the priests of Godama are properly what in a Roman catholic country would be called regulars. There are no secular or officiating priests, having charge of the worship of the lay part of the community. These priests, by Europeans commonly called Talapoins, and by Mohammedans, Raulins, are in the Burma language called Rāhāns, and in the Pali, Thaynka. This is the proper name, as in Europe similar priests are called monks: but as in catholic countries the monks from respect are commonly addressed by the title of father; so among the Burmas the Rāhāns are commonly spoken to by the name Poun-gye, which signifies great virtue.

Somona or Samana is also a title bestowed on the priests of Godama, and is likewise applied to the images of the divinity, when represented, as he commonly is, in the priestly habit. From this name the whole sect of Boudhha have been by many called Samanians, a name frequently mentioned by the antient writers, and said to be derived from the Sanscrit word Saman, signifying gentleness or affability*. The learned Paulinus supposes the Samanians and Magi to have been the same, an opinion which he has been by no means able to render probable. The accounts of the religion of the Samanians, as extracted from the writings of the Rāhāns by Sangermano, the treatise of the Zarado, and the book Kammua, in my opinion show the two sects to be essentially different. The Magi believed in two principles, the one producing all the good, the other all the evil in the world. The former they compared to light or fire, and worshipped the sun and fire, as emblematical of the beneficent principle: but they worshipped no images. They were much addicted to astrology, and have even given their name to all pretenders to supernatural powers. But the Samanians consider every thing as arising from fate by means of water, and look on their divinity as merely a great moral teacher. Devadat they do not esteem a principle of nature,

* Paulinus Mus. Borg. pag. 18.
nature, but a wicked person now undergoing the punish-ment of his crimes; and who has involved mankind in sin and misfortune by teaching a doctrine contrary to that of Godama. Indeed the little mention made of him in the cosmography, in the book Kam-
mua, and by the Zarado, show that he is not so es-
Sential a being in the doctrine of Rāhāns, as Arima-
ni us was in that of the Magi. Besides the Rāhāns 
worship images; and are so far from adoring fire, they 
ever kindle one, lest they should destroy the life of some 
animal. Magic and astrology they also abhor, and 
detest bloody sacrifices. The Magi, on the contrary, 
sacrificed animals. There is even reason to believe, that human sacrifices were common among the fol-
lowers of Zoroaster, and by them introduced into 
the horrible rites of a great part of the ancient world. 
I therefore conclude that the Magi were a different 
sect from the Samanians; and I doubt not, that they 
were a sect of much greater antiquity.

Paulinus also supposes the religion of the Magi 
to be the same with that of the Brahmins, or of an-
tient Egypt, but in this too I think he is mistaken. 
The good and bad principles of the Magi, and their 
want of images, of the personification of the deities, 
and above all, of caste, are great differences. Besides, 
the two systems are considered as distinct by the an-
tients, who surely were the best judges. The religion 
of the Magi, Paulinus, with great probability, con-
tends came from India to Persia in the reign of Cyrus, 
about 560 years before the birth of Christ, 
and from Persia was afterwards dispersed over the 
western nations. How then could the father sup-
pose the doctrine of the Magi to be the parent of the 
religion of Egypt? a religion which had subsisted there, 
and had been transferred to Greece, certainly many 
ages before the invasion of Cambyses.
These Rāhāns live together in convents or colleges, by them named Kiaung, which are by much the best habitations in the empire. They are, as far as I could judge, very decent in their lives, remarkably kind and hospitable to strangers, the best informed men in the country, and very highly respected by the inhabitants. Every college has a head named Zara, of which the literal meaning is reader; but the name may be translated abbot; though by the Portuguese missionaries these superiors of convents have been more commonly styled bishops. As every great personage builds a Kiaung, and procures the Rāhān, who is his spiritual guide, to reside in it as superiour; so there comes to be a kind of distinction in rank between the different Zaras: those who preside over convents built by the powerful and rich, having more spacious colleges, and more Rāhāns, under their authority in consequence of better accommodation, and greater means of subsistence, are no doubt more respected than those who are at the head of Kiaungs built by persons of less distinction. In a particular manner is respected the Zarado, or royal abbot, who may be likened to the king's confessor. His apartments are very superb, his attendants very numerous: next to the king he is the person to whom the greatest external homage is paid: and he is permitted to sleep under a Pyathap,* a dignity not enjoyed by even the king's eldest son, who already possesses one half of the imperial power. But although these heads of colleges have thus different degrees of dignity, according to the rank of the person whose spiritual teachers they are; yet I understood, that every Zara managed the affairs of his own college without any appeal to the superiour of the governor's convent, or even to the Zarado. What power the Zaras have over the Rāhāns, who live in their own convents, I do not know; but it is probably considerable, as they receive from their inferiours great marks of submission and respect.

* A kind of gilded spire in several stages, and ending in an obelisk.
The respect given by the lay inhabitants to all Rāhāns is very great. The road on all occasions is yielded up to them; they are almost always addressed by the names of Poungeye and Bura; and in their convents they are permitted to use painting and gilding, things prohibited to every other subject: nay, they are even in some cases permitted to plaster the outside roofs of their Kiaungs white, and white is the royal colour, the most distinguishing of all royal insignia, and common only to God and the king. Although the priests are thus honoured, yet even the highest of them retain the greatest simplicity in their manners. The dress of the Zarado, when we had the honour of visiting him, did not differ from that of the prostrate multitude, by which he was surrounded. I was told also, that when some years ago he was at Rangoun, he used, like other Rāhāns, to perform his rounds bare-footed, and to receive from door to door the rice that was offered as alms. In this perhaps there was something more than humility; as wherever he went, the streets were covered with cloth, and the men were prostrated imploring his blessing; while the women kept out of his way, as too imperfect beings to be in the presence of a man so weaned from the pleasures of the senses. He is however a person of mild and agreeable manners, and seems well informed; but with a considerable affectation of meekness, and of contempt for worldly cares. At Loungye I met with a Zarao of my acquaintance begging rice in the same manner as the inferiors; and although he was an old infirm man, he had ventured out to a considerable distance, and that in rainy weather.

I have already mentioned the charity of the Rāhāns, which is exerted especially towards strangers; consequently there is no country, where a stranger, unacquainted with every one, and an outcast, would be less likely to suffer want than in the Burma empire: nor during my stay there did I see one common beggar. In the neighbourhood of convents, the pious founders
founders generally build houses for the accommodation of strangers and travellers. These houses are commonly very good defences against the weather; nay, many of them are very handsome. Any person may there pass the day or night, and he is sure of being kindly received by the Rāhāns, and of being by them supplied with provisions. Besides this virtue, the Rāhāns are very humane, and in consequence have often disputes with the magistrates. It is a law, that no criminal can be executed within the gates of a city: nor can he be put to death, should a Rāhān touch him when leading to the place of execution. This privilege the Rāhāns often exert; and although they no doubt are sometimes bribed thus to save a bad man, yet I believe they much oftener interfere to prevent injustice. Another great virtue of the Rāhāns is toleration. From the discourse of the Zarado, it is evident, that they wish to make converts to the religion of Godama, and that they think their religion intended to save all men who are willing to believe; but I never saw nor heard of any attempt by the Rāhāns to use violence in this conversion; or to hinder any man from worshipping God in whatever manner he thought proper: we everywhere saw tolerated the church, the mosque, and the pagoda: and their priests publicly permitted to use their peculiar dresses, and even to assume in their houses those kinds of roofs which are appropriated to officers of considerable rank. Religious processions are publicly made by foreigners; and many infidels are admitted to hold public offices, and places of some distinclusion: nay, some of these officers are allowed to preside at games instituted in honour of religious festivals.

As far as I could learn, the Rāhāns do not at all officiate in the temples, like the parish priests or secular clergy of Europe. Very few of them were present at any of the religious ceremonies or processions that I saw; not even in those made at the consecration of a young priest. Neither did I see many of them at the temples
temples, either on holy days, or at other times; and although some of their convents are generally situated in the neighbourhood of the greater temples, yet that is by no means universally the case: nor did I ever see any of them, who appeared to take charge of a temple, or of the images belonging to it. Their time seems to be employed in instructing the youth in reading, writing, and acquiring such knowledge as the nation possesses, especially in religion, history, and law; and in soliciting provisions for themselves, and for the needy. Their religious worship, I believe, they almost always perform within the walls of their own convents: in all of them they have images, to which at the usual times they chant their prayers.

It is said, that formerly there were convents of women, who entered into orders while young virgins, who continued for life to observe celibacy, and all the rules of the Râhâns, and who were dressed in yellow. This has been abolished, probably by the policy of the kings now governing in eastern India, who think, by the pleasures of a number of women, to allure men into their service. And now a few old women only enter into a kind of orders, shave their heads, and assume a white dress. These attend on the temples and on funerals, and are a kind of servants to the Râhâns: although they never live within the walls of their convents. The Pali books, however, containing the form of admitting women into the facerdotal order, and the rules for their conduct, are still to be found in the libraries of the Râhâns.

In order to give a clear idea of the manner of life and duties prescribed to the Râhâns, I cannot do better than insert a translation of a Latin version of the canonical book called Kammua. An elegant copy of the original Pali was sent by the king to Sir John Shore. The whole I shall endeavour to explain by notes: and to those who wish to enter more into particulars, I would recommend M. de la Loubère's translation.
translation of the maxims of the Talapoins, given us in his invaluable account of the Siammese kingdom. It must be observed, that a translation of the Kammua, which is contained in the collection of Cardinal Borgia,* seems to differ in some particulars from that given by father Sangermano. In the latter, no mention is made of fire and water being the principles of all things, of the purifications of the Rāhāns by fire and water, of these priests passing their time entirely absorbed in a meditation of the Supreme Being, or of the confession of sins on the days of the full and new moon. Father Paulinus alleges the Borgian Kammua to contain all these circumstances: and I can only account for such a difference by supposing, that they are not contained in the original work, but in the explanatory glossary, which is said to accompany the Borgian copy. I never, however, heard of these doctrines prevailing among the Rāhāns: nor is there any hint given of them in the cosmography of Sangermano, or in the treatise of the Zarado.

**TRANSLATION of KAMMU A-ZA, or the BOOK KAMMU A.**

"In the ceremony of ordination, before the Sabeit † is delivered to the candidate, he must approach his "master Upize ‡, and say three times, "Lord, are "not you my master Upize?" He is then ordered to advance

* Paulinus Mus. Borg. pag. 84.
† Thé Sabeit is a round black covered vessel, generally made of lacquered basket-work, and used by the priests in their morning rounds to receive the alms of the charitable.
‡ At ordination there are assembling a great number of Rāhāns, and the Upize is one of the eldest present, and presides in the assembly. It would appear from the account of M. de la Loubere, that in Siam, ordination can only be performed by a particular kind of superior, named Sancrat. Perhaps Sancrat and Upize may mean the same rank: although I did not understand, that among the Burmas it was necessary for the Upize to be a Zara, much less that there was any distinction of rank among these superiors, farther than what has been already mentioned,
advance to the Kammauzara*; and having approached near, he is thus interrogated:"

Kammauzara. "O candidate, is this your Sabeil?"
Candidate. "Verily my lord it is."

Kam. "O candidate, is this your garment?"
Cand. "Verily my lord it is."

"Then shall the Kammauzara say, Retire from this, and wait at the distance of twelve cubits. He shall then read, addressing himself to the assembly of priests, Let the assembly of priests hearken to my words. The present candidate humbly asks from his Upize the facerdotal rank: and surely this is now both a convenient time and place for ordination. In the mean time I will admonish the candidate. You O candidate hearken. At this it is by no means allowed you to tell falsehoods, or to conceal the truth. There are certain defects, which are contrary to the priesthood, and which prevent any person from being received into the priestly order: and as you are now before this assembly of Răhăns to be interrogated concerning these defects, you must answer truly, and declare, what defects are in you, and of what nature they are: what defects you have not, and in what manner you are free from them. Do not be silent: but, lest you should be hindered by fear or shame, bend down your head. Now all those in the assembled council are about to interrogate you.

"Then some priests in the assembly shall thus interrogate the candidate.

Priest. "O candidate, are any of the following diseases on you? Are you afflicted with the leprofy, or with any other foul disorder?
Candidate. "My lord I have no such disorder.

* The reader of the book Kammauz.
Priest. "Have not you the scrophula, or some kind of herpes?
Cand. "My lord I have not any such disease.
Priest. "Have you not the schirrhus, cancer, or itch?
Cand. "My lord I have not.
Priest. "Are you afflicted with the asthma, or cough?
Cand. "My lord I am not.
Priest. "Are you not maniacal, or do you not labour under those diseases which proceed from a corrupted blood, or from the influence of giants, "Lamia, or evil spirits, or of the Nat of the woods and mountains?
Cand. "I do not my lord.
Priest. "O candidate, are you a human being?
Cand. "I am a human being my lord.
Priest. "Are you a male?
Cand. "I am a male.
Priest. "Are you a lawfully begotten son?
Cand. "I am a lawful son.
Priest. "Are you not in debt?
Cand. "I am not my lord.
Priest. "Are you not the dependant of some officer?*
Cand. "I am not my lord.

* From these questions it will appear, how anxious the Rāhāns are not to render the order of priesthood disreputable, by admitting into their fraternity low people, or such as have loathsome diseases. But there are also other reasons for the restrictions here imposed. Celibacy would have no merit in a person deprived of his virility: besides impotence, although an involuntary misfortune, is almost always viewed with contempt. It would be injustice to admit persons in debt, or dependents on great men; for the creditors could not afterwards recover their debt by selling the Rāhān: and all the dependents on the Burma nobles are in their debt. But the great object of thus confining the priesthood to the higher ranks probably is, that at the consecration, the parents may be enabled to give handsome presents to the convent. In fact, the ordination of a son to the priesthood generally costs the family more than his marriage, and setting up in the world, would do: fifty or sixty Pāṭhtha of silver (from 210 to 260 lb. weight) is said not to be uncommon for a wealthy man in a provincial town to expend on such occasions.
LITERATURE OF THE BURMAS.

Priest. " Have your parents given you leave? 
Cand. " They have my lord.

Priest. " Have you compleated your twentieth year? 
Cand. " My lord I have compleated it. *

Priest. " Have you not in readiness your fabric and garments? 
Cand. " They are ready my lord.

Priest. " How are you called? 
Cand. " I am called Naka; that is say, candidate.

Priest. " What is the name of your master Upize? 
Cand. " My master Upize is called Aßeienteitätrit, or excellency.

" After these questions the reader of Kammua shall again say, Most virtuous lord and priests here assembled, I beseech you to hear my words. This candidate humbly begs from his Upize to be admitted into the sacred order, and I have already given him admonition. Now certainly a very convenient time for my lords has arrived: the candidate ought therefore to approach the assembly, and beg this order from them. The priests shall then say, " Approach. The candidate shall approach, and say, " I ask the order of priesthood from the Rähans. " My lords, if you have compassion on me, snatch me from the lay state, a state of sin and error; and appoint me to the sacredotal state, a state of virtue and perfection; and three times shall the candidate pronounce these words. Then shall the Kammua-

* This regulation is very commonly neglected. Rich men, who wish to give their sons a good education, generally make them Rähans about the age of twelve or fourteen years: and the youths continue in the college till they be twenty-four, or twenty-five. Being then fit for business, they leave the convent, and marry: for it is in the power of a priest to relinquish his order whenever he pleases, and to return to the world; and this he does without incurring any considerable scandal. The poorer sort of people send their boys to the convents, where as menial servants they attend on the Rähän who acts as their master, instructing them to read and write: and there are very few men in the country who are not able to do both with facility. Fewer women learn these accomplishments; but still there are many who do, and who are very well informed in such learning as the Burmas polífcs.
"zara say, My virtuous lords here assembled, attend
to my words. This candidate has asked from his
"Upize the facerdotal rank: and he, who thus asks,
is without any defect or impediment, and has prepared all necessaries*. The candidate also in the
name of his Upize beseeches the assembly, that they
would speedily make him a priest. Is it convenient and expedient for the assembly in the name of
the Upize to confer on this person the order of
priesthood? To whatever person this appears con-
venient let him be silent; but if the candidate to
any one appear unworthy of the rank, let that per-
son speak. The reader shall thrice repeat these
words, beginning with My virtuous lords, &c.
He then shall proceed, and say, Now since none
of the priests speak, but all are silent, it is a sign,
that it is proper for this candidate from a state of
imperfection and sin to pass into the state of per-
fecition, from the state of a layman into that of a
priest: and it is a sign, that in the name of the
Upize the assembly are resol ved to make this can-
didate a priest. Therefore by the consent of the
Upize, and of all the assembly, this person is here-
by ordained a priest.
"The reader afterwards proceeds, and says, The
fathers ought to mark under the shade of what foot,
in what day, in what hour, in what season, whether
summer or winter, whether in the morning or even-
ing, this person has been ordained a priest. And
moreover the newly ordained priest is to be admo-
nished concerning the four things which priests are
allowed to do, and the four things which they
"are

* These necessaries are the Sabeit, a proper yellow garment, a large
fan serving for an umbrella, a mat and pillow for a bed, a bucket to draw
water, and a bottle to keep it, a drinking cup, and a chamber pot. This
utensil is peculiar to the Râhâns, and not used by any of the other inha-
bitants: the Râhâns being afraid of killing some insect by performing on
the ground their natural functions.
"are prohibited from doing. Wherefore, I the reader
"admonish him in these words.
"In the first place the facerdotal order consists in
"eating that food only which is procured by the la-
"bour and motion of the muscles of the feet. Where-
"fore it behoves you, O young priest, during the
"whole course of your life, to struggle, that you may
"live on food procured by the labour of your feet.
"But if alms and offerings abound, that is to say, if
"your benefactors come to you, and offer food, you
"may lawfully use the following kinds of provisions:
"1st, all kinds of food, that are offered to Rāhāns in
"general; 2d, provisions that are offered to you in
"particular; 3d, provisions which are sent along with
"a letter; 4th, provisions that are offered on the days
"of the full and new moon; 5th, provisions given on
"festivals by your benefactors. Of all these provi-
"sions you may lawfully eat. The new priest shall
"answer, Verily my lord I have heard."

* In fact, the Rāhāns are allowed to eat every thing, which they receive as a present, provided it be ready dressed; for they never kindle a fire, for fear of destroying some life. What is meant by procuring their food by the labour of their feet, is this: every morning, as soon as they can distinguish the veins on their hands, the whole Rāhāns issue from their convents, each with his Sabeit under his arm. They spread themselves all over the neighbouring streets and villages, and as they pass along, stop a little at the different doors, but without saying a word. If the people of a house are disposed to be charitable, or have not already given away all that has been prepared for the purpose, a person, generally the mistres of the house, comes out, puts the ready dressed provisions into the Sabeit, and the Rāhān goes on silent, and without returning thanks. Nor does he ever solicit for any thing, should it not be convenient or agreeable for a family to bestow alms: but after standing for a few minutes proceeds on his round. So deli-
cate are they in this particular, that it is sinful for a Rāhān on such occasions to cough, or make any signal, by which he might be supposed to put the laity in mind of their duty. To the greater part of convents however such begging is not necessary for a subsistence, as the offerings sent to the different Rāhāns, by the persons whose spiritual guides they are, to the sons of the wealthy by their parents, and to the whole on holy days and festivals, are generally more than sufficient for their own maintenance. As they literally take no care for to-morrow, the superfluity they daily give away to animals, to the poor, and to needy strangers or travellers. However, that they may be able to supply these various demands, and comply with the letter of this law,
The reader then proceeds. In the second place the order of priesthood requires the use of garments covered with dust, of garments which have been thrown into public sepulchres: wherefore, O young priest, you must, during your whole life, use such garments as are stained with the dust of the field. However, if induced by your learning and teaching, many benefactors resort to you, then are you permitted to use the following cloaths in your dress; namely the cloths called Choma; cloths made of cotton, silk or wool; cloths made of the bark of certain trees; cloths made of the feathers of certain birds. It is lawful for you to use all the above-mentioned cloths. The new priest answers as before.*

The reader then proceeds. In the third place, the sacerdotal rank requires its members to live in houses constructed under the trees of the woods. Therefore, O newly ordained priest, you ought during the whole of your life to inhabit such houses. Nevertheless, if your genius and doctrine attract many benefactors, you may inhabit houses of the following law, even when they are in no want of provisions, the Rāhāns make their daily rounds. In consequence we find in the Burma dominions none of those well endowed convents in retired places, such as are in many parts of Europe: but the convents are always in the neighbourhood of towns, and always in proportion to the wealth and number of inhabitants. The finest Kiuungs in old Aria are now deserted, and their gilded halls have become the habitations of outlaws and unclean animals. Hence also it is, that near many of the most celebrated temples there does not live a single Rāhān. Kaunomudo and Shue Loga tharaby are both temples of great dimensions, and high celebrity; and at certain feasons vast multitudes of the laity resort thither on account of their supposed sanctity: but at present there is not in their vicinity a sufficient number of inhabitants to support a convent, and therefore no Rāhāns live near them.

* Several of these cloths I have never seen: but the Rāhāns are well cloathed with a large yellow or yellowish mantle, which they throw round them in a decent and becoming manner. Under this they have several smaller pieces of dress, which however I never observed with sufficient accuracy to enable me to describe. They have the head and beard, are very clean in their persons, and always go bare-footed. None of them wear jewels, or ornaments of gold or silver. In hot weather, I never saw them indulge themselves by exposing their naked bodies; much less do they, like the jogies of Hindustan, ever expose their nudities; but are singularly modest and decent in their dress and behaviour.
following kinds: namely, houses surrounded with walls;* houses ending in a pyramid;† such houses as are triangular or four sided; such as are adorned with flowers and figures carved in wood;‡ such as are built with arches. In such, and the like houses, you may for the future dwell. The newly ordained priest answers as above.§

"Again the reader says, in the fourth place, O new priest, during the whole course of your life, you are only to use such remedies as men have thrown away for being useless. However, if your virtue, and manner of teaching, procure you benefactors, you are permitted to use as remedies, butter, milk, whey, oil, honey, sugar, syrup, and the like. The new ordained priest answers, Verily my lord I have heard."*

"Again the reader of Kammua says, Since you have

* Such houses are not permitted to be used except by persons of very high rank.
† Such houses are only permitted to God, the king, and the Râhâns.
‡ These ornaments are only used in charitable or religious buildings, such as Kiaungs, chapels, and the public buildings for the reception of travellers.
§ It is a singular circumstance, that the art of constructing arches should have been lost among the Burmas. From many buildings, especially at Pougan and Gnaungoo, it appears, that formerly they could construct very excellent brick arches, both circular and gothic: but now no one in the empire can be found sufficiently skilful to arch over the opening of a window. Masonry indeed has fallen into neglect, the jealousy of the late princes having prohibited to private individuals the use of brick or stone houses.

§ I shall hereafter give some farther account of these buildings. Suffice it now to say, that I believe, none of the Râhâns live at present in the woods. Their Kiaungs are generally situated in the most agreeable places that can be found in the immediate neighbourhood of large villages, towns, or cities. The surrounding grounds are well cleared and inclosed, and generally contain many fine trees, especially the tamarind, mango, coconut, and palmira. Kiaung is the name which I heard used for these buildings by every one in the Burma empire, except Sangermano, who used the word Bau or Bao. At the time I took this name to be some vulgar Portuguese word: but I have since learned, (Paulinus Mus. Borg, pag. 24,) that it is the Pali name for a convent, derived from Bhava or Bhavana, the Sanscrit word for habitation.

* In fact, I found the priests willing to take any medicine which I prescribed.
have been admitted into the order of priesthood,
you are no longer permitted, after the manner of
laymen, to commit any carnal deed, either alone,
or with another, whether it be man, woman, or
beast. A priest who after the manner of laymen
commits such actions, is no longer to be esteemed
one, nor as appertaining to the divine order. To
what can such a person be compared? In the same
manner as in a beheaded man the head can never be
again joined to the body, and so live; so the priest,
who after the custom of laymen has committed for-
ication, or any similar act, is cut off from the
priestly order, never more to be restored to their
number. It behoveth you therefore, O young
priest, during the whole course of your life, never
to commit such deeds. The newly ordained priest
shall say, Verily my lord I have heard your words*.

The reader then says, It is by no means per-
mitted to a Rāhān to steal, or to take to himself
even the value of a dram of silver. The priest,
who steals even such a value, is to be esteemed as
fallen from the priesthood, and is no longer to be
numbered in the divine order. Such a priest may
be compared to the withered leaf of a tree: and as
this can never again recover its verdure, so the
priest, who steals even a dram of silver, no longer
can be esteemed as belonging to that sacred order.
Wherefore, O young priest, during the whole
course of your life, abstain from theft. The young
priest answers as before.

The reader then says, It is unlawful for a priest
to

* From this it might be inferred, that unnatural practices were very
common among the Burmas; and in various old accounts of Pegu we have
mention made of such having been the case, and of some very absurd re-
gulations having in consequence been established. At present, as far as
I could learn, neither these regulations are observed, nor even in convents
are at all practised the crimes on account of which they were imposed.
The present royal family have been too wise to trust to such frivolous
devices, and the number of common women, which, under certain regula-
tions, they permit in every considerable town, has probably been an effec-
tual remedy for the greater vice.
to take away the life of any animal, should it be even the smallest insect. The Rāhān, who taketh away the life of the vilest insect, shall no longer be a priest, or of the divine order. To what thing can he be compared? He is like a great rock rent in two parts: as it is impossible that the rock should ever again be united, so it can never happen, that he should again be reckoned a priest, or of the divine order. Wherefore you, O newly ordained priest, ought to take care, during the whole course of your life, not to commit any such murder.

The newly ordained priest answers as before.

The reader of Kammu then says, Whoever is admitted into the priesthood, can by no means be permitted to extol himself as a saint, as a person endowed with any preternatural gifts; such as the gifts called Meipo or Zian: Neither is it for him lawful to declare himself a hermit, or a person that loves solitude. The priest who, prompted by ambition, falsely and impudently pretends to have obtained the extraordinary gifts of Zian or Meipo, or to have arrived at Nieban*, is no longer a priest of the divine order. To what can he be compared? In the same manner as a palm-tree cut through the middle can never be rejoined, so as to live; in such manner shall this ambitious priest be unworthy of being esteemed as belonging to the sacred order. Wherefore, O young priest, during the whole of your life avoid such criminal excess. The young priest shall answer, Verily my lord I have heard all, that even till now you have said."

END OF THE BOOK KAMMU.

The month of Namiaung, the second of the Burma year, is the season in which young men are admitted into

* We have already explained the meaning of Zian and Nieban. Meipo is said to mean those prerogatives, which are exercised by such as, quite free from worldly thoughts, employ their time entirely in sublime meditations. What a wide difference is here between the priests of the Burmas and of the Hindus!
into the priesthood. While we were at Rangoun during this season, I had frequently an opportunity of seeing part of the ceremony. For several days previous to assuming the habit, the young men's parents gave great entertainments. Sheds were built in the streets opposite to their houses, and under these were erected seats adorned with flags, and flowers natural and artificial. Here generally assembled four or five of the young candidates, dressed out in the most gaudy manner, and sat admiring the supple motions of dancing girls, or laughing at the grimace of players and mimics. During this time, at least once a day, the candidates went through the town in a procession, consisting often of five or six hundred persons. The following order, that I observed in one of these processions, will give an idea of the whole.

1. Drums and Burma hautbois.
2. Young girls gaudily dressed, their heads adorned with tinsel, gum flowers, and the wings of an elegant beetle, the Buprestis ignita of Linnaeus.
3. Well dressed young women, carrying on their heads basins filled with fruits and flowers, an offering for the temple.
4. The fathers and male relations of the young men, with their attendants carrying their swords of state, and other insignia of royal favour. Among them was a Zaregye, an officer of considerable rank in the town.
5. Well dressed women carrying on their heads pots of rice, a present for the Râhâns.
6. Bamboo stages, each carried on four men's shoulders, and supporting an imitation of the Padezabayn. This consisted of a large upright bamboo, in the center, with many smaller fixed into it, in imitation of branches, which were ornamented with tinsel and gum flowers. An umbrella terminated the whole, and from the branches were suspended the different kinds of utensils which are used by the Râhâns: such as sheiks, fans, water-buckets, bottles, &c. &c.
7. Women
7. Women carrying on their heads pillows made of fluffed mats, some of them very fine. These also were an offering to the Rāhāns.

8. An offering of mats and small carpets, which serve the Rāhāns for beds. These also were carried on women's heads.

9. Yellow cloth for the dress of the Rāhāns, put up in rolls ornamented with flowers, and carried in the same manner.

10. The candidates, each carried by four men on a bamboo stage. They were richly dressed in velvet and gold lace, with many golden ornaments, and their heads were covered with tinsel and gum flowers.

11. A cart, drawn by two buffaloes, adorned with flags, flowers, and the like: and containing dancing girls, and a band of music.

12. The mothers and female relations of the young men.

13. Several officers of government with their attendants and badges of honour: but not in high dress. Among them was the Akoonwun, or collector of the land-tax of the province, an Armenian Christian.

The whole was very gaudy, and must have cost a great deal of money. The women were all well dressed in silk and muslin. Many of them wore very fine muslin, and had much gold and silver in their ornaments. All of them had good sandals covered with scarlet cloth. Their deportment, although lively, was modest, and graceful. In many other processions the candidates were mounted on horseback.

After having thus for some days enjoyed the splendour and amusements of the world, the young Rāhāns must bid adieu to the pleasures of the senses: they are conducted to the assembly of the Rāhāns to be ordained; are deprived of all their ornaments, and of their hair, and assuming the yellow habit, leave behind, their parents and the world.
It will be observed, that no Rāḥāns assisted in the processions: and I may say the same of all the religious ceremonies which I saw the laity perform. On the grand festivals the laity endeavour to please God by all kinds of amusements; by wrestling, dancing, music, plays, and fireworks. On other occasions they solicit Godama's favour by prayers and offerings at the temples.

Among the worshippers of Bouddha, there are So-ge, or hermits, who pretend to a high degree of sanctity, arising from a mortification of their passions and appetites. They ought to live in caves, woods, and subterraneous buildings, of which we saw many remains in the neighbourhood of Gnaungoo. It was one of these hermits, named Menu, who is said to have formed the code of Burma laws, a fable probably invented to increase their authority. Menu was also, according to the Brahmens, the author of their laws; but the Menu of the Brahmens is, according to the two legends, as different from the Menu of the Burmas, as the two codes of laws are different in their justice and tendency. These So-ges at present are not numerous in the Burma dominions, I not having seen one; but in Hindustan, under the name of Jogies, they are still very common, and are highly indecent, from their going about the streets, and entering all houses absolutely naked. They are not of the Brahmenical order, and to me seem to be the remains of the gymnosophists mentioned by antient authors, and, I suspect, often by inaccurate antiquaries, confounded with the Brahmens. Paulinus every where in his account of the Borgian museum, confounds these Zoges, Jogies, or, as he wrote, Yoguis, with the Samanians or Rāḥāns: for this however he assigns no reason. Among the Burmas I always heard them distinguished as two different orders. But in reality all religions have had their Zoges. Men who thought to acquire the favour of God by enduring misery in this life, or who, by pretending to more than common sanctity, and command
mand over their passions, have wished to impose on the weakness of their neighbours, have, I believe, been found among unenlightened nations of all religious persuasions: and it appears to me, that the Zoges are nothing more than such deluded or deluding persons.

It has already been said, that Godama commanded his images and relics to be worshipped*. The largest and most celebrated temples are generally in the form of a pyramid, and are supposed to contain some of those relics; such as a tooth, a bone, a hair, or a garment. To these temples, as containing the sacred relic, the prayers of the devout are addressed, and their offerings presented. The pyramids are often of a great size, constructed of solid brick-work plastered over, and generally placed on a prodigious elevated terrace. The base of the pyramid is frequently surrounded by a double row of small ones; and the summits of the whole are always crowned with umbrellas, made of a combination of iron bars into a kind of filagree-work, and adorned with bells. Many of these pyramids are from three to five hundred feet high. In the larger temples the umbrella, with at least the upper part of the pyramid, and often the whole, is entirely gilded over: and then the title of Shué, or golden, is bestowed on the edifice. Other temples of nearly a similar structure, but hollow within, contain images of Godama, to which the adoration of his disciples is directed. Both these descriptions of temples are in common called Būră, which M. Louberé writes Pra, and says that it means respectable. It is a phrase only given either to God, and to his images, relics, temples, and priests; or to the king, and those governing in his name. An inferior gives it to the meanest officers of government; but a superior never gives it to an inferior, as our king often calls his nobles, my lord, a title somewhat analagous. Neither is Bura ever applied to a stranger: a man

* Page 266 of this Volume.
who has any dependance on a European, will call him Thakiayn, or Mayn, which signify prince, but he will by no means call him Bura. Although this be the common name for these temples, yet it is only a term of respect, their proper name in the Burma language being Zedee.

Although many large temples, which are hollow within, contain such images as are considered of particular sanctity; yet the greater number of the images destined for the adoration of the laity, are placed in chapels, if I may so use the word, which surround the pyramids containing the relics of Godama's person, and which the Burmas call Bura Kiaung. In these images Godama is always represented as a young man of a placid countenance, with strongly characterized Burma features, and generally in the dress of a Rāhān. His postures are various. The most common is that of sitting cross legged upon a throne, with his left hand resting on his leg, and holding a book, and with his right hand hanging over his knee. In other images he is represented standing, and that in four postures; each differing somewhat in the position of his hands. In others he is represented reclining on a couch, with his head supported on pillows*. The throne on which he is placed, is exactly like the royal throne. Having imagined, that the delineations of the Hindu gods floating on the leaves of the lotus, derived their origin from imperfect traditions concerning the deluge, the vigorous fancy of Paulinus discovers a representation of the elegant flowers of that plant in the simple ornaments of these thrones. Mus. Borg. pag. 67, compared with tab. 1. fig. 5. The images of the god are of very various materials; clay, copper, silver, and alabaster. Many of them are completely gilded, and many partly gilded, and partly ornamented with paintings of flowers. The size also of these images varies exceedingly: some are not above six inches high, and others are of a most colossal stature. I saw an image

† See page 269 of this Volume.
in old Ava, consisting of one solid block of pure white alabaster, and in a fitting posture: I had no opportunity of measuring its dimensions; but its fingers appeared to me to be about the length and thickness of a large man's thigh and leg, from whence a conjecture may be made of the immensity of the whole.

Another object of great veneration among the worshippers of Godama are stones of considerable dimensions, carved with various hieroglyphics, and said to represent, or to be the impressions of his feet. The hieroglyphics, on the different stones which I saw, were not alike. In the Burma language these stones are called Kye do bura, or the respectable royal foot. One of them, on the mountain Amala Saripadi, * in the island of Ceylon, has given rise to various fables; Christians, Jews, and Mahommedans, uniting to call the mountain Adam's-peak, and the stone the impressions of Adam's-foot.

Besides these objects of adoration, there are many images common about the religious buildings of the Burmas. The principal disciples of Godama, especially his two favourites, Mokela and Saribout, with many other persons, who assisted the god when on earth, are by his followers considered as saints: and many images of these saints, dressed like Rāhāns, generally accompany those of their master. Mokela and Saribout occupy the most conspicuous places, the one sitting on the right hand, and the other on the left of Godama. The images of the other saints are generally in the posture of adoration. In some chapels there are many images of these saints, without any of the divinity. There is a group of female figures very common at the temples: it represents a princess with her attendants: the princess is on her knees offering up her long hair. It is said, that once, when Godama was like to perish in a river, he was saved by this princess,

* Stephens's translation of Faria y Souza, T. 2. p. 4. c. 19, p. 2. s. 25.
princess, who threw him a rope which she made of her hair. The ends of the walls, which project on the different terraces, as you ascend to the temples, are generally ornamented with figures of Godama's cook, a fat, deformed, but droll looking fellow. Besides human images, there are also at the Burma temples many representations of elephants, monkies, and other animals, but especially of lions couchant, which often are of a most colossal size. The Burmas however, although they consider these disciples, persons, and animals, as venerable, on account of the services they performed to Godama, have no idea of worshipping their images; nor, as far as I could learn, of imploring them to use in their behalf their interest with the divinity: much less do they ever address their prayers to the gods of the Brahmens, a custom which seems to have been adopted by some of the Cingalese, or natives of Ceylon. It is however true that the Burmas are well acquainted with the gods of the Brahmens, and have many legendary books containing an account of their adventures, especially those of Rama, king of Baranudee: but they look upon these personages merely as heroes, or as remarkable men, only admirable for the wonderful actions they performed. In some of their temples, and in the carved ornaments of Kiaungs, and of houses for the reception of strangers, there are representations of the actions of these heroes, and of the Nat. Among these the figure of Ganesa is one of the most common.

Every true worshipper of Godama prays before he goes to sleep, and before he rises in the morning, which is generally at dawn of day. The old men, and women of all ages, are more regular in their devotions than the youths, as is the case, I believe, in all countries, where the women are not degraded into the rank of brutes. In praying they use rosaries, often made of amber beads, and often of various seeds, especially of the Canna indica Lin. and Cæsalpinia oleoferma Rox. The former plant is peculiarly sacred
to Bouddha, as it is supposed to have sprung from his blood, when once on a time he had cut his foot, by striking it against a stone. I believe they have fixed forms of prayer in the Pali language; at least I never could understand one word of their prayers, farther than that they contained many repetitions of the different appellations of the divinity; but that might have been owing to the manner in which they were chantcd. The priests have no regular daily service like the mass: but they have certain forms of prayer, which they use on the dedication of a temple or Kiaung, or on certain festivals, on which presents are offered to them. The women also, in all their little distresses and fears, such as in thunder, or in a squall of wind on the water, invoke the Nat: and they seldom get fruit, but they put it on their heads, turn to the four quarters of the earth, and call on the Nat, either wishing for their protection, or to show, that with these amiable beings they would willingly participate the good things of this life.

Besides these private devotions, it is customary to make offerings at the temple. The king daily sends his offering to a small temple, which is within the palace; and many people make occasional offerings, especially when they, or any of their family, are in distress. But the common times for making offerings at the temples are the four phases of the moon, especially the days of full and change, which may be called the Burma sabbaths. They reckon Friday very unfortunate, and consequently undertake no business on that day: but they keep holy no day of the week, which with most nations is probably an astronomical division of time. While we were at Amarapura, I observed, that the Burmas, on their sabbaths, fasted from sun rise to sun set; and I was told, that very strict people never slept in their houses on the night following these holy days: but I have now reason to believe, that such strictness and fasting are only required for three months of the year, which are therefore a kind of lent.
The offerings made at the temples are very various: boiled rice, fruits, especially the cocoa-nut, flowers natural and artificial, and a variety of curious figures made of paper, gold leaf, and the cuttings of the cocoa-nut kernel, are the most common. It is also very customary for the rich to offer elegant white umbrellas with golden ornaments, large slippers, canes, pillows, and all manner of utensils, gilded, and of the finest materials; these are deposited in the temples or chapels for the use of the divinity. The poor, in place of these costly offerings, content themselves with paper imitations of the same utensils. These gifts are placed before the god or his temples on altars, or on wooden benches: and the eatables become a prey to the crows and dogs. People who have been in peril by water, present models of ships or boats; some of which are formed with considerable neatness. One of the most common ways for a person to express his devotion, is by gilding a patch of a temple, of which many on this account make a very motley appearance. The king's royal munificence is extended to a very great amount, in gilding anew many large temples. We were told, that this part of his expence amounted annually to 20,000 peiththa of silver, or nearly 86,805 lb. weight of that valuable metal. The expence of Eimfilé mayn, or the heir apparent, is also considerable in the same way. When we visited the celebrated temple Ananda, the person, who superintended the repairs then carrying on by the prince, told us, that four peiththa of pure gold* were prepared for the gilding, which would be bestowed on the inside of that edifice. The roads leading to the principal temples, near populous places, are on holy-days lined with stalls, and little portable shops, where gold leaf, ornamented fruits, flowers natural and artificial, and other similar offerings are sold: so that the devout walk out, buy their offering by the way, and go to the temple where it is to be presented. The women are by far the most numerous.

* Value about £830.
numerous devotees, and go in considerable numbers together, and in their best dress. They resort to the galleries and houses built for the accommodation of those who frequent the temple: there they assemble in crowds to adjust their dress and offerings: for a while they talk, laugh, and amuse themselves; then they repair to the temple, fall on their knees, say their prayers, make their offering, and depart. Bloody sacrifices, among the disciples of the mild Godama, would be behelden with abhorrence.

The two principal festivals, which we saw, were on the occasion of the new year, and on the ending of lent. During the first, we were at Pegue, and were present at many of the games, and entertainments, given during its celebration. Only one day's amusement was at the grand temple, Shue-Modo, and no religious ceremony, as far as we saw, took place. The most singular amusement at this festival, is the concluding one of throwing water, which to a rude people affords very good sport. For the whole last day of the festival, the men are permitted to throw water at the women, and the women at the men: such women as are with child being however exempted. All the young people look with joy for this merry day, and it is conducted with the greatest good humour, the one sex not being likely to give offence to the other.

Lent having ended, during the whole month Sa-deen-giut there are illuminations: every house has erected by it a kind of mast, from which are suspended one or more lamps. In the royal palace, a pyramid of lamps, at least 150 feet high, was supported by a bamboo scaffolding. From the lodgings of the deputation, this illumination of Amarapura made a very splendid appearance across the lake, by which we were separated from the city. It is at this time that the nobles from all parts of the empire resort to court to pay their homage to the king. On this occasion we had an opportunity of seeing a model of the hill Mienmo, which was erected in the outer court of the
the palace. It was constructed of paper and bamboo, and agreed very well with the account given by the missionary Sangermano.

During the principal days and nights of these festivals, there is an almost constant succession of wrestling, dancing, music, processions, fireworks, and theatrical entertainments: but of these, it is not at present my intention to give a description.

To finish what I have to say on the religion of Godama, it would appear by all the accounts given me, that the Burmas received their laws, religion, and government, from the people of Arakan, a people speaking the same language with themselves, and from these circumstances often called Myamma-gye, or great Burmas. This happened about 600 years ago; but the people of Pegue and Arakan, had received the same gifts from Ceylon a considerable time earlier. Previous to this, the Burma empire had probably been occupied by tribes in a state of civilization similar to that of the Karayn, Kiayn, Lowa, and other simple nations, who now inhabit the wilder parts of India beyond the Ganges. Whether or not this knowledge, derived from Ceylon, has been of use to these eastern nations, cannot easily be determined. These simple tribes have perhaps more skill in agriculture, and more industry than the Burmas; they have art enough to manufacture comfortable, and even handsome clothing: they are a peaceable people, little inclined to war: among themselves they retain that civil liberty, which most tribes in a similar state enjoy; and it is universally agreed, that their morals are extremely good: but then they have no laws; are ignorant of even the art of reading; and their religious notions are so crude, that although they believe in a future state, yet they are ignorant of its being a state of reward or punishment.

Those of the Chinese, who have adopted the religion of Shaka, have probably obtained it from Hinduslan,
Hindustan, by the route of Thibet. It is undoubtedly the Chinese who have communicated this religion to Japan, and to their former dependants in Tonkin and Cochinchina. Nor is it by any means improbable, that it is through China that this worship has extended to Siam. M. De la Louberé informs us, that the Siamese pretend to have got their religion from Laos, in which case it must have come from China. Indeed, from its very early introduction into that empire, at the latest in the sixth century of the Christian æra, it has had abundance of time to have reached Siam as early as we can suppose that country to have been civilized.

In consequence of this universal diffusion of the religion of Bouddha over the countries to the east of Hindustan, it has been imagined, that all the nations inhabiting these extensive regions, and that even the Chinese, arc of the Hindu race; but can we be justified in forming such an opinion, because about 1700 years ago some priests came from Hindustan into China, and converted to their opinions a multitude of the lower people? As well might we say, that the Romans in the time of Trajan, and of his virtuous and powerful successors, were Jews, because some priests had then come from Jerusalem, and had converted, to their opinions, a great number of the Roman populace, and slaves. The learned and manly Sir W. Jones, among the vast variety of objects which engaged his attention, seems to have hastily adopted this opinion. He supports the hypothesis entirely on a passage in the institutes of Menu, where, says he, "we find the following curious passage: "Many families of the military class having gradually abandoned the ordinances of the Vedas, and the "company of the Brahmens, lived in a state of de- "gradation, as the people of Pundraca, the Chinas, "and some others." He then says, "this being di- "rect, positive, disinterested, and unsuspected, would "decide the question, if we could be sure that the word
word China signifies a Chinese*. Setting aside the difficulties attending the proof of this, of which he has by no means given a compleat solution, I would ask, if it is not to be highly suspected, that the Brahmens, like all other bigotted and ignorant sects, wish to exalt themselves by making all nations inferior to their own? I have before observed, that the laws of Menu in use among the Burmas are very different from those translated by Sir W. Jones†. The Burma code is certainly more than six hundred years old, as it was introduced from Ceylon at least so long ago; but it would be very difficult to shew, in a country where there are no annals, that the institutes of Menu have existed in their present form for the half of such a period. The Burma copy makes no mention of this state of degradation. Were it ascertained, that the Gotama mentioned in the Vedas‡ was the same with Godama of the Rāhāns, it would be evident that the Chinese could not have abandoned the ordinances of the Vedas: for at the time of Godama, the Chinese were a civilized people, with nearly the same laws which they at present enjoy, and the Vedas of consequence would be of later date than their institutions. It is however alleged, that there have been more than one Godama or Bouddha: but whether this opinion be well founded, or whether the Godama mentioned in the Vedas, be the institutor of the Burma religion, or whether he lived earlier or later than that legislator, I do not pretend to ascertain.

A few more particulars remain to be mentioned relating to the learning of the Burmas.

The Burmas have among them many histories, containing an account of the lives and actions performed by the different families of their princes. These histories

* Asiatick Researches, II, 369. † Page 292 of this Volume.
‡ Sir William Jones, in the Asiatick Researches, IV, 170.
tories are, I am told, very fabulous; every action being attended by omens and prodigies. Still however they may throw some light on a part of the world hitherto so little known: and I am hopeful soon to be able to lay before the learned, a translation of the Maha-raja Wayn-gye, the most celebrated historical work of the Burmas. These people have also translated histories of the Chinese and Siamese, and of the kingdoms of Kathee, Ko-shanpyee, Pagoo, Saymmay, and Laynzayn. Of all these I saw copies, and several of them I procured for Sir John Murray.

On medicine the Burmas have several books. They divide diseases into ninety-six genera, and of these several are subdivided into many species. Their books contain descriptions of all the ninety-six diseases, with various recipes for their cure. Of the animal kingdom, mummy is a favourite medicine. The Burmas are acquainted with the use of mercury in the cure of the venereal disease: but their manner of giving it is neither certain nor safe. They make a candle of cinnabar and some other materials, and setting fire to it, the patient inhales the fumes with his nostrils. The patient is however rarely able to persevere long in this course, as it always produces a want of appetite, and extreme languour. The greater part however of the Burma remedies are taken from the vegetable kingdom, especially of the aromatic kind, nutmegs being one of their most favourite medicines. They are well acquainted with the plants of their country, and for a vast number have appropriate names. On the whole, however, the practice of their physicians is almost entirely empirical; and almost every one has, or pretends to have, a number of private recipes, on which the success of his practice chiefly depends. I was often tempted by wonderful stories concerning the efficacy of these nostrums, in order to induce me to purchase the secret, which some of them pretended to have been handed down from their fathers for several generations. Indeed I found
found a great spirit of illiberality among my brethren of trade; nor were they exempt from imposing on the weaknesses of the sick, by a pretension to supernatural powers. In spite however of all these indirect means of influence, I found them deservedly not in possession of an honourable estimation among their countrymen. One curious custom relating to the Burma physicians may be mentioned. If a young woman is dangerously ill, the doctor and her parents frequently enter into an agreement, the doctor undertaking to cure her. If she lives, the doctor takes her as his property; but if she dies, he pays her value to the parents: for in the Burma dominions, no parent parts with his daughter, whether to be a wife, or to be a concubine, without a valuable consideration. I do not know whether the doctor is entitled to sell the girl again, or if he must retain her in his family; but the number of fine young women, which I saw in the house of a doctor at Myeda, makes me think the practice to be very common.

In surgery, the skill of the Burmas, I believe, goes no farther than dressing wounds, and setting bones. Of late indeed they have introduced from Arakan the art of inoculation for the small-pox. This practice has however not become general, as a very great proportion of the people's faces are pitted by that disease.

On law, the Burmas have many treatises; both containing the laws of Mênù, and copious commentaries on these. Whether they still have any copies of the law, as originally imported from Ceylon, I know not: but I was told, that the Damathat-gye, or code in common use, has suffered several alterations, and additions, made by the decrees of various princes.

I heard of no poetry, which the Burmas possess, except songs. Of these they have a great number on a variety of subjects, and are fond of quoting
them on many occasions. Their music, both vocal and instrumental, appeared to me very bad. Some of their musical instruments are, indeed, not so barbarously noisy, as those of the Hindus and Chinese; but the airs, which the Burmas performed on them, I could not at all comprehend. On the contrary, many of the Hindu and Chinese airs seem to me not at all unpleasant: but I must confess, that I am entirely unskilled and rude in the science of music.

The Burmas have dramatic entertainments, used at all festivals, and well described by M. de la Loui-ère in his account of Siam. The performers indeed, which we saw, were all Siamnese. Although these entertainments, like the Italian opera, consist of music, dancing, and action, with a dialogue in recitative; yet we understood, that no part but the songs was previously composed. The subject is generally taken from some of the legends of their heroes, especially of Rama; and the several parts, songs, and actions, being assigned to the different performers, the recitative part or dialogue is left to each actor's ingenuity. If, from the effects on the audience we might judge of the merit of the performance, it must be very considerable; as some of the performers had the art of keeping the multitude in a roar. I often, however, suspected that the audience were not difficult to please: for I frequently observed the Myooxun of Haynthawade (the man of high rank whom we most frequently saw), thrown into immoderate laughter by the most childish contrivances. These eastern nations are indeed a lively, merry people; and like the former French, dance, laugh, and sing, in the midst of oppression and misfortune.

The original of most of the Burma books on law and religion is in the Pali or Pale language; which undoubtedly is radically the same with the Sanscrit. I was assured at Amarapura that the Pali of Siam, and Pegu, differed considerably from that of the Burmas, and an intelligent native of
Tavay, who had been at Cingala or Candy, the present capital of Ceylon, and at the ruins of Anuradhapura, the former capital, assured me, that the Pali of that island was considerably different from that of Ava.

In many inscriptions, and in books of ceremony, such as the Kammua, the Pali language is written in a square character, somewhat resembling the Bengal Sanscrit, and called Magata. Of this a specimen may be seen in the description of the Borgian museum by Paulinus. But in general it is written in a round character nearly resembling the Burma letters. Of this kind is the specimen given by the accurate M. de la Louère, and which some persons have rashly conceived to be the Burma. There is no doubt, however, that all the different characters of India, both on the west and on the east of the Ganges, have been derived from a common source: and the Burma writing of the whole appears to be the most distinct and beautiful.

In their more elegant books, the Burmas write on sheets of ivory, on very fine white palmira leaves. The ivory is stained black, and the margins are ornamented with gilding, while the characters are enamelled or gilded. On the palmira leaves the characters are in general of black enamel; and the ends of the leaves, and margins, are painted with flowers in various bright colours. In their more common books, the Burmas with an iron style engrave their writing on palmira leaves. A hole, through both ends of each leaf, serves to connect the whole into a volume by means of two strings, which also pass through the two wooden boards, that serve for binding. In the finer binding of these kind of books the boards are lacquered, the edges of the leaves cut smooth and gilded, and the title is written on the upper board, the two cords are by a knot or jewel secured at a little distance from the boards, so as to prevent the book from falling to pieces,
but sufficiently distant to admit of the upper leaves being turned back, while the lower ones are read. The more elegant books are in general wrapped up in silk cloth, and bound round by a garter, in which the Burmas have the art to weave the title of the book.

As there are but few of the Burmas who do not read and write, almost every man carries with him a parawaike, in which he keeps his accounts, copies songs, till he can repeat them from memory, and takes memorandums of any thing curious. It is on these parawaiks that the Zares or writers in all courts, and public offices, take down the proceedings and orders of the superior officers: from thence copying such parts, as are necessary, into books of a more durable and elegant nature. The parawaike is made of one sheet of thick and strong paper blackened over. A good one may be about eight feet long, and eighteen inches wide. It is folded up somewhat like a fan, or thus $a \sim \sim \sim \sim b$ each fold, or page being about six inches, and in length the whole breadth of the sheet. Thence, wherever the book is opened, whichever side is uppermost, no part of it can be rubbed, but the two outer pages, $a. b.$ and it only occupies a table one foot in width by eighteen inches long. The Burmas write on the parawaike with a pencil of steatites. When in haste the Zares use many contractions, and write with wonderful quickness. I have seen them keep up with an officer dictating, and not speaking very slow. But when they take pains, the characters written on the parawaike are remarkably neat. Indeed this nation, like the Chinese, pique themselves much on writing an elegant, and distinct character. When that, which has been written on a parawaike, becomes no longer useful, the pages are rubbed over with charcoal, and the leaves of a species of Dolichos: they are then clean, as if new, and equally fit for the pencil.

* I do not know, but that this ought to be written Parucek.
Every convent has a collection of books: several of which are pretty considerable. The most common copiers are indeed the Rahans, who, prepare books both for their convents, and for presents to their lay benefactors. These books are kept in chests, much ornamented with gilding, and bits of looking glass, fastened on with lacquer, in the shape of flowers. At Amarapura we were shewn a part of the royal library. This is a brick building, surrounded by enclosed courts, and temples, which occupy a delightful situation, in the N. W. angle of the city. Near it is a small, but most elegant Kianaung. To this, at times, the monarch retires; and we were shewn the gilded couch on which he reposes, while the Zaraino reads to him, and instructs him in the duties of religion. The library itself is neither a convenient nor handsome building. The gallery, into which we entered, contained about a hundred chests, gilded on the sides, and lacquered above, with the general title of their contents written in golden letters. The chests were large, and if full, must have contained many thousand volumes. As we saw only a part, I presume that the king's collection is very extensive. He is, indeed, said to be a very intelligent, and learned prince. He was very desirous of obtaining some Brahmen more learned, than those he had, to instruct him in astronomy: and he had caused the institutes of Menu to be translated from the English of Sir William Jones. He must therefore have heard of what is pursued among the Europeans, in at least oriental literature: and it is to be hoped, that some more useful books may attract his notice: books which might tend to improve the people, and give them more enlightened notions of politics, of the arts, and of science. Hitherto, I suspect, the laws, or religion, of the Burmas, have contributed little to the happiness of the people; but fortunately they have not, like those of the Brahmens, placed any insurmountable obstacles in the way of national improvement.

IX. NARRATIVE
NARRATIVE
OF
A JOURNEY TO SIRINAGUR.

By CAPTAIN THOMAS HARDWICKE.

HAVING sometime ago visited the mountainous country of Sirinagur; I hope a succint detail of some of the most remarkable circumstances, which occurred in that journey, will not be unacceptable to the Asiatick Society.

On the 3d of March, 1796, I commenced the journey, from Futteghur, in company with Mr. Hunter; and we arrived, on the 19th of the same month, at Anoonpsheher: our route was circuitous, for the purpose of visiting the several indigo plantations, established by European gentlemen, in this part of Dooab. Here were conspicuously displayed, the effects of skill, of industry, and of a spirit of commercial enterprize, in beautifying and enriching a country, which in other parts exhibiting only waste and forest, supplies, indeed, matter to gratify the curiosity of a naturalist, but suggests to the philanthropic mind the most gloomy reflections.

At Anoonpsheher I recruited the necessary supplies for the prosecution of my journey, and on the 23d, continued my march alone; for my fellow-traveller was under the necessity of returning, from this place, to attend the residency with Dowlut Row Sindeah, on a visit to the Marhatta camp.

On the 30th of March, I arrived at Nejeebabad: the town is about six furlongs in length; with some regular streets, broad, and enclosed by barriers at different distances,
distances, forming distinct bazaars. In the neighbourhood, are the remains of many considerable buildings. Near the south-west end of the town is a large garden, called Sultan Bagh; containing in the center a spacious square building, erected by one of the sons of Nejeeb-ud-dowlah.

On the north-east side of this garden, and at the distance of 300 yards, is another, in which lies buried Nejeeb-ud-dowlah: his grave is without ornament, raised on a terrace, a few feet from the ground, in an area of about eighty yards, surrounded by a square building, formed into apartments and offices, for the accommodation of the servants, appointed to perform the usual ceremonies, for the benefit of departed souls.

A considerable traffic is carried on here, in wood, bamboos, iron, copper, and tincal, brought from the hills. It is also the center of an extensive trade from Lahore, Cabul, and Cashmir, to the east and south-east part of Hindustan.

At the distance of ten miles and six and a half furlongs, from Nejeebabad, on the road to Hurdwar, is Subbul-gowr, a very extensive line of fortification, enclosing the town; both of which exhibit little more than naked walls falling to decay. Much of the ground, within the fort, is in cultivation. In the south-east curtain, or face of the fort, is a lofty brick-built gateway. The high road leads close past the north-east bastion, and continues along the north face, the whole length, within thirty or forty yards of the ditch.

On the 1st of April, I arrived at Unjermi Ghat, about three miles below Hurdwar, on the eastern side of the river. The town of Hurdwar occupies a very small spot, consisting of a few buildings of brick, the property
property of eminent Goosseyns. It is situated on the point of land at the base of the hills, on the western side of the river.

The stream here divides itself into three channels, the principal of which is on the eastern side, and running along a pleasant bank, called Chandee Ghat, meets the base of the hill, which gives this name to the Ghat below. The deepest channel at present is in some places about fifteen feet, a depth not long continued; and near the termination of each reach of the river, the stream breaks, with rapidity, over beds of large loose stones, sometimes with no more water than sufficient to give passage to large unloaded boats. The points of the islands, several of which are formed in the bed of the river, are principally of loose pebbles and sand; but, the rest of the land, between the different channels is covered with the Mimosa Catechu.

The ascent of the hill, called Chandee, commences at a little distance from Unjennee, from which, to the top of the hill, I consider about two miles and a quarter. Some part of this distance, however, is a long and elevated level bank. The ascent to the high part of the hill, is very steep; the path narrow, and requiring much attention and exertion, to prevent accidents in stepping, from the looseness of the stones and earth.

On the top of this hill is a Tersool or trident, about fourteen feet high, of stone, supported by a small square base of mason-work; the base of the forks is ornamented, on the east side, with figures of the sun and moon, between which, upon the shaft, is the figure of Ganesa.

Near the base of the shaft, are the figures of Kaalka Devi, and Hanuman, the former on the east, the latter west. The space on the summit of this hill, is not twice larger than the square of the pedestal.
destal of the trident: from this, a narrow ridge leads to another hill, something higher: and in this manner the hills here are mostly connected; the highest being generally of a conical form. They are very thinly clad with vegetable productions: the trees are few, and small; and the grass, at this season of the year, parched up. In some parts of the hills, however, where the aspect is more northerly, the grass is more abundant, finer, and seemingly much liked by the cattle.

On the top of Chandnee, a Bramen is stationed to receive contributions from visitors during the continuance of the Mela: the produce, he says, upon an average, is for that time, about ten rupees per day.

This Mela, or fair, is an annual assemblage of Hindus, to bathe, for a certain number of days, in the waters of the Ganges, at this consecrated spot. The period of ablution is that of the Sun's entering Aries; which, according to the Hindu computation, being reckoned from a fixed point, now happens about twenty days later than the vernal equinox. It accordingly fell on the evening of the 8th of April. But every twelfth year, when Jupiter is in Aquarius, at the time of the Sun's entering Aries, the concourse of people is greatly augmented. The present is one of those periods, and the multitude collected here, on this occasion, may, I think, with moderation, be computed at two and a half millions of souls*. Although the performance of a religious duty is their primary object, yet, many avail them-

* This estimation may appear enormous; and it therefore becomes necessary to give some account of the grounds on which it was formed. Small sums are paid by all, at the different watering places; and the collectors at each of these, in rendering their accounts to the Mehuntis, who regulate the police, are obliged to form as exact a register, as a place of so much bustle will admit of. From the principal of these offices, the number of the multitude is found out, probably within a few thousands. The Goosseyu, on whose information the calculation was formed, had access to these records; and the result, as delivered above, was thought more likely to be under, than over the truth.
selves of the occasion, to transact business, and carry on an extensive annual commerce. In this concourse of nations, it is a matter of no small amusement to a curious observer, to trace the dress, features, manners, &c. which characterize the people of the different countries of Cabul, Cashmir, Lahore, Butaan, Sirinagur, Cummoow, and the plains of Hindustan. From some of these very distant countries, whole families, men, women, and children, undertake the journey, some travelling on foot, some on horseback, and many, particularly women and children, in long heavy carts, railed, and covered with sloping matted roofs, to defend them against the sun and wet weather: and during the continuance of the fair, these serve also as habitations.

Among the natives of countries so distant from all intercourse with people of our colour, it is natural to suppose that the faces, dress, and equipage of the gentlemen who were then at Hurdwar, were looked upon by many as objects of great curiosity: indeed it exceeded all my ideas before on the subject, and as often as we passed through the crowd in our palanquins, we were followed by numbers, of both women and men, eager to keep pace, and admiring, with evident astonishment, every thing which met their eyes. Elderly women, in particular, salaamed with the greatest reverence; many shewed an eagerness to touch some part of our dress; which being permitted, they generally retired with a salaam, and apparently much satisfied.

At our tents, parties succeeded parties throughout the day, where they would take their stand for hours together, silently surveying every thing they saw.

Sometimes more inquisitive visitors approached even to the doors of the tent, and finding they were not repelled, though venturing within, they generally retired, with additional gratification; and fre-
quently returned, as introductors to new visitors, whose expectations they had raised, by the relation of what themselves had seen.

The most troublesome guests were the Goosseyns, who being the first here in point of numbers and power, thought it warrantable to take more freedoms than others did: and it was no easy matter to be, at any time, free from their company: it was, however, politically prudent, to tolerate them; for, by being allowed to take possession of every spot round the tents, even within the ropes, they might be considered as a kind of safe-guard, against visitors of worse descriptions; in fact, they made a shew of being our protectors.

In the early part of the Mela, or fair, this sect of Fakeers erected the standard of superiority, and proclaimed themselves regulators of the police.

Apprehending opposition, in assuming this authority, they published an edict, prohibiting all other tribes from entering the place with their swords, or arms of any other description. This was ill received at first, and for some days it was expected force must have decided the matter; however, the Byraagees, who were the next powerful sect, gave up the point, and the rest followed their example. Thus the Goosseyns paraded with their swords and shields, while every other tribe carried only bamboos through the fair.

The ruling power was consequently held by the priests of the Goosseyns, distinguished by the appellation of Mehunts, and during the continuance of the Mela, the police was under their authority, and all duties levied and collected by them. For Hurdar, though immediately connected with the Mahra
ratta government, and, at all other seasons, under the rule and control of that state, is, on these occasions, usurped, by that party of the Fakeers, who prove themselves most powerful; and though the collections made upon pilgrims, cattle, and all species of merchandise, amount to a very considerable sum; yet no part is remitted to the treasury of the Mahratta state.

These Mehunts meet in council daily: hear and decide upon all complaints brought before them, either against individuals, or of a nature tending to disturb the public tranquillity, and the well management of this immense multitude.

As one of these assemblies was on the high road near our tents, we had frequent opportunities of noticing their meetings; and one of our sepoys, having occasion to appear before it, in a cause of some consequence, it gave us an opportunity of learning something of the nature of their proceeding.

The sepoy, it seems, on leaving the station, where his battalion was doing duty, was entrusted, by one of the native officers, with fifty rupees, and a commission to purchase a camel. With the intention of executing this trust, he mixed with a crowd, where some camels were exposed for sale; and while endeavouring to cheapen one to the limits of his purse; shewing the money, and tempting the camel merchant to accept, for his beast, the fifty rupees, he drew the attention of a party of Marwar men, who were meditating a plan to get it from him. Five or six of those men, separating from the crowd, got round him, said, they (or one of them) had lost his money, to the amount of fifty rupees; that he, the sepoy, was the man who had it; and, with much clamour and force, they got the money from him. Fortunately, the sepoy’s comrades were near; he ran towards them and communicated the alarm, and got assistance,
assistance, before the fellows had time to make off; or secrete the money; they, however, assumed a great deal of effrontery, and demanded that the matter should be submitted to the decision of the Mehunts: before this tribunal the cause was consequentially brought, and an accusation laid against the sepoy, by these men of Marwar: the money was produced, and lodged in court, and the cause on both sides, heard with deliberation. Unlucky for the Marwarees, they had neither opportunity to examine or change the money; and knew not what species of coin made up this sum: which circumstance led to their conviction: for being enjoined by the Mehunts, to describe the money they had lost, they named coin very different from what the purse contained: but when the sepoy was called upon to answer the same question, he specified the money exactly. The judges immediately gave a decision, in favour of the sepoy, and restored him his money: the Marwaras were fined each in the sum of five rupees, and sentenced to receive each fifty stripes, upon their bare backs with the Korah.

The Goosseyns maintained an uncontested authority, till the arrival of about 12 or 14,000 Seek horsemen, with their families, &c. who encamped on the plains about Jualapore. Their errand here was avowed to be bathing; and soon after their arrival they sent Oodassee, their principal priest or Gooroo, to make choice of a situation on the river side, where he erected the distinguishing flag of their sect, for the guidance and direction of its followers, to the spot. It appeared, however, that no compliments or intimation of their intentions, had been made to the ruling power; and the Goosseyns, not willing to admit of any infringement of their authority, pulled down the flag, and drove out of the place those who accompanied it. Some slight resistance was shewn by the Seeks, in support of their priest, and the dignity of their flag, but was repelled with much violence, and the Goosseyns,
Goosseyns, not content with driving them away, abused and plundered the whole party, to a considerable amount.

The old priest Oodassee, on his return to the Seek camp, complained to Rajah Saheb Sing, their chief, in the name of the body collective, of the insult and violence they had met with from the Goosseyns.

A consultation was immediately held by the three chiefs of the Seek forces, viz. Rajah Saheb Sing of Puttealath, and Roy Sing and Shere Sing of Boolrath, who silenced the complainants by promising to demand redress and restitution for what they had been plundered of.

A vakeel was immediately dispatched, with a representation, from the Seeks to the Mehunts, or priests of the Goosseyns, pointing out the right, they conceived they possessed, in common with all other nations, to have access to the river; and complaining of the wanton insults they had met with, from their tribes, when in the peaceable execution of their duty: however, as they had no remedy, to make amends for some part of the ill treatment they met with, yet they demanded an immediate retribution of all they had been plundered of, and free access to the river or place of bathing.

The Mehunts heard their complaints, expressed concern at what had happened, and promised their assistance, in obtaining the redress sought for: and the matter, for the present, rested here; the Goosseyns giving back, to the Seeks, all the plunder they had taken, and admitting of their free ingress and egress to the river.

All was pretty quiet, during the few remaining days
days of bathing; but on the morning of the 10th of April, (which day concluded the Mela) a scene of much confusion and bloodshed ensued. About eight o'clock on that morning, the Seeks (having previously deposited their women, children, and property, in a village, at some distance from Hurdaewar) assembled in force, and proceeded to the different watering-places, where they attacked, with swords, spears, and fire-arms, every tribe of Fakereos that came in their way. These people made some resistance, but being all on foot, and few, if any, having fire-arms, the contest was unequal: and the Seeks, who were all mounted, drove the poor Sammyassees, Byraagees, Goosseyns, Naagees, &c. before them, with irresistible fury. Having discharged their pieces within a few paces, they rushed upon those unfortunate pilgrims with their swords, and having slaughtered a great number, pursued the remainder, until, by flight to the hills, or by swimming the river, they escaped the revenge of their pursuers.

The confusion, spread among other descriptions of people, was inconceivable; and every one, thinking himself equally an object of their resentment, sought every means of safety that offered: many took to the river, and in the attempt to swim across, several were drowned: of those who endeavoured to escape to the heights, numbers were plundered, but none who had not the habit of a Fakere was in the least hurt: many parties of straggling horsemen now ranged the island, between Hurdaewar and Unjinnee gaut; plundering the people to the very water's-edge, immediately opposite to us; fortunately for thousands, who crowded to this gaut, the greatest part of one of the vizier's battalions, with two six-pounders were stationed here; two companies of which, with an addition of a few of our own sepoys, and a native officer, whom Captain Murray very judiciously sent across the river, kept the approach of the horse in check. Finding they could not attack the crowd on the water's-edge, without receiving a smart fire
fire from the sepoys, as well as exposing themselves to the fire of their guns, they drew off, and by about three o'clock in the afternoon, all was again quiet.

At this time, the cause of such an attack, or the future intentions of this body of Seeks, was all a mystery to us; and popular report favoured the conjecture, that they intended to profit from the present occasion, and by crossing the river, at a few miles lower down, return, and plunder the myriads of travellers who crowded the roads through Rohilcund. However, the next morning discovered they had no such intentions; as, from the adjacent heights, we saw them take their departure, in three divisions, bending their march in a westerly course, or directly from us. The number which had crowded to the river side, opposite to our tents, was too great to be ferried over in the course of the night, and consequently remained in that situation: fearful of the approach of day, and in dreadful alarm from the expectation of another visit from the Seeks, but by eight o'clock, their minds were more at ease, and they offered up their prayers for the English gentlemen, whose presence, they universally believed, had been the means of dispersing the enemy.

From the various information we had now collected, we concluded this hostile conduct of the Seeks was purely in revenge against the tribes of Fakeers: many of the wounded came to our camp to solicit chirurgical assistance and they all seemed very sensible, that they only were the objects of the enemy's fury.

Accounts agree that the Fakeers lost about five hundred men killed, among whom was one of their Mehunts, or priests named Maunpooree; and they had many wounded: of the Seeks about twenty were killed, but the number of wounded not known.
The mountains in the neighbourhood of Hurdkar afford, but little amusement for the mineralogist; nor is a fossil to be found in them, impregnated with any other metal than iron.

In some situations, where the fall of water has exposed their surface, for one or two hundred feet, nothing more is exhibited than an argillaceous marl, varying in hardness and colour, according to the metallic particles they contain: sometimes this variety is shown very distinctly, stratum super stratum, the lowest consisting rather of siliceous particles, having loose quartzose sand, with very little earthy mixture; and crumbling to pieces with the least application of force; the next a fine smooth marl, of a dull cineritious grey, compact, and soapy to the touch: it is quickly diffusible in water, and does not effervesce in acids. The next is of a pale liver-coloured brown, possessing properties like those of the preceding one, but somewhat more indurated, and most likely containing more iron: the fourth, or superior stratum is still browner than the last; and exhibits, in its fracture, small shining micaceous particles. In other places, the whole side of a mountain consists of siliceous sand, mixed with mica and some calcareous earth; the whole very slightly connected, laminated, and tumbling in large quantities into the water-courses below; sometimes found sufficiently indurated to bear the violence of the fall. From the place called Neel Kound, a winding nullah, of about a mile in length, falls into the Ganges a little above Unjimnee: in the bed of it, a greater variety of stones is found than might be expected from the nature of the hills, in which the source of it lies; thus granite, and opaque quartz, of different colours, are found in pretty large rounded masses: yet no such stones, as far as observation can trace, form any part of the mountains, in this neighbourhood.

The high ground between the bank of the Ganges and
and the mountains, also contains many of these stones, in a loose unconnected state; some lying very deep in the earth, as may be seen on the side of the bank exposed to the river: these bear a perfect resemblance to those stones in the beds of the nullah, and Ganges, which owe their form to the attrition of rolling currents for ages: but the elevated situation in which these are bedded, leaves no room for supposition, when, if ever, they were subject to such action.

The riches of the vegetable kingdom, however, made ample amends for the want of variety in the mineral productions. As an enumeration of the plants I met with, during my stay at this place, would interrupt the thread of my narrative, I have subjoined them in the form of an appendix, together with all the others found in the course of my tour; adding such remarks on their history, or economical uses, as I judged might be interesting. I have only to observe, that the season just now is not very favourable for finding herbaceous plants in flower; the greatest abundance of this description is brought forward by the periodical rains, and a visit in the months of September and October, would, no doubt, be attended with a very successful investigation. On the other hand, to explore the loftier products of the extensive forests, with the deliberation the research requires, it should be begun in January, and continued to the end of April.

As a necessary measure, previous to my proceeding on my intended journey to Sirinagur, I dispatched a servant, with a letter, to the rajah of that place; signifying my intentions of visiting his capital, and forwarding, at the same time, a letter I had the honour to receive, from the vizier, Asoph-ul-Dowlah, through the kind influence of the resident, Mr. Cherry. My servant returned on the day I was quitting Hurdevar, (12th April) with the rajah's acknowledgment of my letter, and a perwannah or pass through
through his dominions written in the ancient Hindu character.

On the 12th of April, I took my departure from Hurdwar, or Unjinneeghat; and on the 13th, making two marches of it, arrived at Nejeebabad. This was certainly a retrograde motion, but two or three reasons operated, to induce me to change the route I originally intended to take; first, Hurdwar was a place of less security for the cattle and baggage I must leave behind, and the difficulty of feeding them greater, than in a place where established bazars produced abundance of grain.

Secondly, some little conveniences necessary to my manner of travelling, I could not get made up here; and thirdly, the road direct from Hurdwar to Sirinagar, was more difficult of access and worse supplied with provisions and water, than the one recommended from Nejeebabad; I therefore decided in favour of the latter.

Among other preparations while here, a substitute for a palankeen was requisite, and I made up what is called a Chempaan, which is nothing more than a litter, of about five feet in length and three in breadth, supported between two bamboos, or poles, fixed to the sides a little above the bottom, and carried in the manner of what is called in Bengal a Tanjaan, by a short yoke fixed between the poles near the ends, and parallel to them.

On the 20th, I commenced my march from Nejeebabad, and encamped at the petty village of Coadwara, at the distance of eighteen miles. This village is situated at the distance of three furlongs, within the barrier of this ghat, where is the first ascent of the hills through a rugged road. The barrier is a large double gate of plank, flanked on the left by a precipice, and on the right by a wall of loose stones, connected with the neighbouring ridge of hills. This point of land, including the village, is nearly encircled by the Koa-nullah, a shallow, but clear and rapid stream; but being surrounded on the
the north, east, and south, by higher mountains, the situation, must be, at some seasons, intolerably hot, and probably unhealthy.

These ranges of hills rise, with a moderate, though unequal slope, from the plains below, and are skirted by deep forests, extending from Hurduwar through Rohilcund, Oude, and the countries to the eastward, and produced many kinds of valuable timber, and an abundant store of plants, never yet, perhaps, brought under the systematical examination of the botanist. They also abound with game of many descriptions. Elephants are found here, and sometimes range beyond the skirts of the woods, to the great injury of whatever cultivation they meet with: but their depredations are particularly directed to sugar plantations.

They are considered inferior, in size and value, to the elephants brought from the eastern countries; and are seldom caught, but for the purpose of taking their teeth.

The soil of these forests varies, from a black fat earth, where the trees or shrubs which it nourishes, acquire a large size; to a firm reddish clay, and mixtures of gravel and loose stones of various descriptions.

On the 21st, I marched to Amsore, a small village on a little cultivated spot. The first part of the road lay in the bed of the Koa-nullah, and the whole of it was so rugged, that although the distance is only computed four coss, and I judge it not to exceed seven miles, I employed three hours and a half in walking it, and my baggage did not arrive till six hours after I set off. The general direction of the road is about N. E. by E.

On the 22d, a walk of two hours and forty minutes carried
carried me to Ghinouly, the distance of which from Amsure, I compute to be eight miles; the road being much less obstructed than yesterday. Towards the beginning of this day's march, the road passes between two stupendous rocks. The stones, in this part of the nullah, lying in very large masses, the stream passing between with very great rapidity, and the only path across being on spars laid from rock to rock, the passenger is exposed to imminent danger. Farther on, I met with one of the small water-mills, called Puchuckee, which was now working. The construction is very simple: the stones which are little larger than those turned by the hand, and called chuckies, are worked by means of an horizontal wheel; the spokes of which are cut like the valves of a venetian window, and set obliquely into the case of a perpendicular shaft; and, upon these valves, a stream of water, from a narrow spout, at about four feet elevation, falls, with force enough, to give brisk motion to the machine. The water is brought to it, by banking up the stream of the nullah, till it acquires the necessary elevation. The hopper is a conical basket, suspended with the narrow end of the cone over the hole in the stones; and being kept in a gentle motion, it supplies them constantly and regularly. In this manner, two men relieving each other, will grind from four to six maunds of grain in twenty-four hours.

The village at Ghinouly consists of three huts. Seldom more than five or six together are to be met with; and it is a large village that has so many as ten.

The hills in this situation, are not so close as those in the road behind me; the ground between, on each side the nullah, elevated and very pleasant; and the cultivation carried to the very summits of those mountains. The sides of all, look greener than those hitherto seen, but I was not yet sensible of any
any moderation in the heat of the day. The thermometer was up to ninety-five, and never lower than seventy-two within my tent.

On the 23d, after a walk of three hours and ten minutes, I arrived at Dosah, an inconsiderable village on the banks of the nullah, along which lay the greatest part of the road, from last encampment. This day's journey exhibited a considerable variety of scenery, being now a rugged path, between abrupt impending rocks, and now, little open spaces, surrounded with gently sloping hills, the sides of which are diversified with clumps of fir, oak, and saul, and with cultivated ground. In one of these latter situations, the water is conducted from one side of the nullah, to the fields on the other by an ingenious, though simple contrivance. A trough, formed by hollowing the body of a large fir-tree, is placed across, where the over-hanging rocks favour the communication, and conducts a stream, sufficient for the purpose of irrigation.

The Koa-nullah has its source about three miles above Dosah to the north, and its first small branch rises in a spring at Dewara-Kaal, and receives increase from several small rills, issuing from the surrounding hills, between Dewara-Kaal, and this place.

The bed of the nullah here contains great quantities of Mica, of various tints, according to its impregnation with iron or other metallic ores; the mountains exhibit it in very considerable masses; and, in many places, it falls crumbling down their sides, into the water-courses below. Thence it is carried away, by the currents, shining at the bottom, with a lustre little less brilliant than silver. None of it, however, is of so pure a transparency as to serve the purposes to which this substance is usually applied.
The thermometer, to-day, was at the highest ninety, and at four in the morning down to sixty-five; the wind variable and threatening change of weather.

The sportsman may here find ample source of amusement. Black partridge, hares, and quail, are found in plenty, without much labour; and the eager pursuer, who does not consider the ascending of heights, and creeping into jungles, material obstacles to his amusement, will find two species of fowls, and the deer called parah, by the natives (Cervus Porcinus, L.).

The fish of the nullah are small, but make a very tasted fry, and are an acceptable variety to the scanty supply of animal food procurable: they are mostly of the genus Cyprinus, four species of which I particularly remarked. The manner of taking fish in these shallow rapid nullahs may not be unworthy of notice. One method is by rod and line; about eight or ten yards of one end of the line is filled with nooses, or snares, formed of horsehair from one to three or four hairs strong, according to the size of the fish expected to be caught; and at intervals of about fifteen inches, oblong pieces of iron are fixed, to prevent its being carried away by the force of the current: the other end of the line, perhaps ten or twelve yards, is passed through a bow, at the end of a short rod, and kept in the hand below, and both are managed in the same manner as a trowling rod and line; thus prepared, the fisherman casts the end with the snare across the stream, where he lets it remain about half a minute, during which time, he pokes a light forked stick, carried in the right hand, into holes about the stones, thus driving the fish up the stream, against the snares of the line, and on taking it up, generally has secured from one to four fish. By these simple means, he seldom fails, in about half an hour, to get a tolerable fry.

Another
Another method, practised by the natives, is to stupify or kill them, with vegetable substances: for this purpose they make choice of a pool formed by the current, and turning the stream, by heaping up stones, stop up the supply of fresh water into it, in the same manner, closing every outlet, then bruising the fruit of a tree common here, they cast a quantity into the pool, and in about half an hour, its deleterious effect seldom fails to shew itself: the fish, unable to preserve their equilibrium, tumble about, rise to the surface of the water, and are easily taken with the hands.

On the 24th, in three hours thirty-five minutes, I reached Belkate. The scenery, on this day's march, was more beautifully diversified, than in any preceding one. The forests of oak, fir, and boorans*, are here more extensive, and the trees of greater magnitude than any I have yet seen. Unfortunately, neither the traveller's mind, nor his eye, can be enough disengaged, to admire, in security, the sublimity of this prospect: for after the ascent of a pretty high ridge of mountains, the road is continued along their side; winding, and so narrow, that without constant attention, you are in danger of being precipitated into an alarming depth of valley on the right.

The spot, on which I encamped, is a narrow valley, separating the villages of Bedeyl and Belkate, which are nearly opposite to each other; the river Nayaar running between, with a stream beautifully transparent, in the direction of W. N. W.

The principal source which forms this river, if I am to trust the authority of the natives, lies at a place called Doobree, about forty eight coss, or four days journey east (to a man on foot, without burthen;) and issues, in a considerable stream, from the root of a tree called Beh-kul. It falls into the Ganges, about

* See the catalogue annexed to this paper.
nine miles below Dec-praag, with which I find the natives have some communication in the rainy season; and through this channel carry on a small traffic in iron, grain, &c. in canoes formed from the trunk of large Semel trees.

I crossed the river, in knee-deep water, and pitched my tent under a large mango tree, where two or three trees more afford ample shade for servants of all descriptions.

The mountains in the neighbourhood of this valley lie in lamellated strata of various coloured fissile stones or slate, from a dull clay colour, to ash, bluish black, light brown, and ferruginous brown; in some places a vein of white quartz runs through, in an irregular direction.

The houses here are covered, with a kind, much resembling the common writing slate.

On the 25th I walked, in two hours and fifteen minutes, to Nataana, a village of five or six houses upon the brow of a sloping hill. It looks into an excessive deep valley, formed, by the surrounding hills, into a narrow bottom, resembling an inverted cone, and cultivated in ridges, down their sides, to the very base. The road from Belkute ascends gradually, and the elevation here is such as considerably to reduce the temperature of the air. From an accident to my thermometer, I could only estimate this by my sensations, which did not indicate a higher degree than eighty-five at noon. The natives say, it continues thus cool, all the month of May, and they seldom, at any time, experience excessive heat.

I pitched my tent, at the distance of three quarters of a mile from the village, near a little stream of wa-
JOURNEY TO SIRINAGUR.

ter, which supplies the wants of the inhabitants. It issues from the mouth of a bull, rudely hewn out of the rock, and fall into a reservoir below. The stream is not larger than a musquet barrel, but the supply is always constant and clean. The wheat, in some parts, is now ripe, and the women employed in reaping it.

The mountains, for some miles round Nataanee, have a naked appearance. No trees to be seen, but upon distant hills; some bushes grow along the ridges, formed for banking up the earth; and the standing corn is almost the only vegetation besides, to be seen. The soil is scanty, and very stony; and the crops thin, except those near the village, which are improved by the little manure the inhabitants give the land; they seem too indolent, however, to extend this improvement beyond one or two ridges: indeed, as the carriage must be upon their own backs, the labour would be great. Their only cattle are bullocks, but those, as far as I could observe, are not used for the carriage of burthens. They draw the plough, trample out the corn: and the milk of the cows forms a principal part of the people's sustenance. Ever since I ascended the ghauts, I observed the same features mark the breed of oxen in those hills; they are low, not exceeding the height of the small Bengal cows; their bodies short and thick, legs very short; but slight appearance of that fleshy protuberance, common to the male of these animals in Hindustan; their horns are short, tapering, wide at their base, and gradually approximating towards their points, with a slight curve inwards: their heads short, and thick: the prevailing colour is from red to dark brown; with black noses, and black tips to their tails.

Curiosity led me into the village, but what chiefly excited my attention, was the appearance of uncleanliness, indolence, and poverty; the only proof of their attention to some kind of comfort, is in the struc-
ture of their houses, which are of stone, laid in common mortar, with a sloping roof, covered with fine slate, raised to a second floor, which is occupied by the family, while the lower, or ground one, gives cover to their cattle in bad weather.

Their cows are the only animals to be met with among them, they have neither dog, cat, goat, sheep, nor common fowls.

On the 26th, I marched to Adwaanee, along a range of mountains, covered with forest trees, of various species. The distance from Nataana, by computation of the natives, is six coss. I was three hours and five minutes in walking it, and considering the nature of the road, and time lost by the stopping, I conclude the true distance to be about eight and a half miles. The distance would be considerably less, on a line drawn from Nataana to this place, which regains the former direction, and places Adwaanee about N. E. from the point marched from.

This situation is a narrow, elevated ridge, exposed to the influence of a bleak and chilling wind. The only remnant of human industry is the scattered ruin of a house for the accommodation of travellers.

On the 27th, at half an hour past four in the morning, I proceeded on my journey. The road continuing with an ascent, for about half an hour, brought me to the summit of a ridge, from whence is seen the lofty chain of snowy mountains, in a very extended line, from east to west. Those mountains are seen from some parts of Rohileind; but so remote and indistinct, as to give no idea of the magnificent scenery that now opened to my view; the grandeur of which was every moment increasing by the more powerful illumination of the rising sun.
One of the most conspicuous summits of this chain is distinguished by the name of Hem, near the base of which is the famous place of Hindu worship called Budde-nauth. It is marked to travellers by the greater breadth of its top; and rising in four or five rugged, but rather conical points. Its bearing from where I made these notes was N. N. E.

The road, from this ridge, gradually descending, I arrived, at thirteen minutes past seven, at Teyka-ca Maanda. Here is only one indifferent building, for the accommodation of travellers, and a few scattered hamlets appear on the sides of distant mountains.

The air proved here as cold as at Adwaanee, and having no shelter from trees, was the more smartly felt. The rocks are of a course dull granite in some places; and in others, extensive beds of various kinds of schistus appear; most of them lying in a vertical position and near the upper surface, dividing into fine laminæ, exhibiting colours, inclining to purple, yellow and green. That most exposed to the air crumbles to dust under its influence.

On the 28th, I walked, in two hours fifty-five minutes, to Chet-kote, situated in a confined valley, where the heat was excessive. In the early part of the march, over a gentle ascent, the snowy mountains, which had been concealed by a hill in front, suddenly emerging, presented a spectacle truly magnificent.

29th April, 1796, Sirinagur.

I left Chet-kote this morning at twenty-five minutes past four, the descent still continuing; and twenty minutes walk brought me to a pretty large nullah which falls into the Aluknundra, a short distance below Sirinagur. By banking up the stream, it is raised to an height sufficient to work two or three
three of those little mills called *Pun Chukees*, which from their vicinity to the metropolis, are kept in constant employ. This nullah is called *Koonda Gaud*. The road continued along it for twenty-two minutes through little fields of unripe corn; leaving the nullah, I ascended for thirteen minutes, which brought me to the summit of a ridge, from whence I had a distinct view of the town and valley of *Srinagar*; and the winding course of the *Ahknundra* river through it, running in a direction from east to west along the north side of the town. On the top of this hill, a *Fakeer* has stationed himself, to contribute to the relief of the thirsty traveller, and deals out the waters of the holy *Ganges* for a pecuniary compensation.

About fifteen minutes before six o'clock, I reached the valley, and the banks of the river five minutes after. I was here met by a person of the rajah's household, who was sent to congratulate me, on having surmounted the obstacles of a difficult journey; and to know what he could do for me, or what contribute to my immediate accommodation; offering, if a house would be acceptable, to clear one for my reception. The compliment was pleasing, but I knew too well the structure of their habitations, to suppose they could furnish me with better accommodation than my tent. Therefore I declined the offer, and chose for my encampment, a pretty thick mangoe grove, on the south west end of the town, near the foot of the hills.

As I may now promise myself a little rest from daily fatigue, I will take a slight retrospect of the country I have travelled over, before my attention is called to the objects that may here be worth particular notice.

From the ghaut of *Coadvira* to *Srinagar*, is an assemblage of hills, jumbled together in many forms and directions, sometimes in chains, lying parallel to each other, but of no great extent, and often connected
connected at their termination, by narrow ridges, running at right angles across the vallies between. The summits of all are very narrow, and of various shapes, and the distances between each range short, consequently the vallies much confined, and a late traveller justly observes, "Not a spot is to be seen that would afford room to accommodate one thousand men in tents."

Some of these ranges are covered with forests, and are always green, some are naked and stony, neither affording shelter to the birds of the air, nor the beasts of the field. The number in cultivation form the smallest part, but so few traces of either houses or inhabitants are to be seen, that to sum up the whole in one general conclusion, depopulation and poverty are striking features throughout, and a greater share of the country seems in the undisturbed possession of the birds and beasts of the forests, than appropriated to the residence of man.

In the evening of this day, the rajah paid me the compliment of a visit, accompanied by his two brothers, and some other officers of his suite, besides a considerable crowd; of which, however, many more were led to gratify curiosity than belonged to the train of the rajah. Himself and brothers were on horseback, and except one or two others, the rest followed on foot. They dismounted at the entrance into the grove, where I met the rajah, and after the usual salutation, he introduced me to his brothers Pra-Kerem-Sah and Pretem-Sah.

This ceremony over, we proceeded to the tent, which was soon filled by this party of all descriptions: much order, however, was observed, and the rajah, after some few questions and complimentary remarks, staid about twenty minutes, when night approaching, he apologized for his hasty departure, and took leave.
He appears to be about twenty-seven years of age, in stature something under the middle size, of slender make, regular features, but effeminate. He speaks quick, and not remarkably distinct.

His elder brother is a stouter and more manly person; about twenty-four years, though he has the looks of riper age than his brother. They bear no resemblance to each other. The younger is a strong likeness of the rajah in make, features, and voice; a little under him in size, and, I believe, about nineteen years of age.

In their dresses, no signs of greatness or ostentation appear; they were in plain muslin jamaus with coloured turbans and kummerbunds, without jewels or other decorations, nor was the dress of the rajah in any respect more distinguishing, than those of his brothers.

I found the heat of this day very distressing; sometimes without a breath of air, and when any was evident, it came with an unpleasant warmth.

In the evening of the following day, I returned my visit to the rajah. He received me at the entrance of a court in front of the house, and conducted me by the hand to a square terrace in the center of it. I was here introduced to his vizier and dewan; and after being seated, and compliments over, he commenced a conversation, by asking several questions relative to my journey, manner of travelling, purpose for which I undertook such an expedition, repeating several he had asked the preceding day, on that subject.

He made some remarks relative to the extent of the British possessions in India, spoke of the late Rohilla
Ruhilla expedition, and noticed the knowledge the English possess in the art of war with admiration, and as unequalled by any other nation. He begged to be indulged with a sight of the exercise as practised by our troops, and the little party of sepoys with me performed it, much to his amusement and satisfaction.

After a stay of about an hour, the evening being far advanced, I took my leave.

The valley of Sirinagur extends about a mile and a half to the eastward, and as much to the westward of the town. The river Aluhmandra enters the valley near a village called Seerkote, which bears E. N. from the town. Its course is nearly from east to west; the breadth of the channel from bank to bank about 250 yards; but in the dry season it does not exceed eighty or 100 yards. At the western extremity of the valley, the current strikes with violence against the stony base of the mountain. Near this place, the river is crossed by means of a contrivance called here a joolah. Two scaffolds are erected in form of a gallows, one on each side of the stream; over these are stretched very thick ropes, to form, on each hand, a support for the rest of the bridge. To these, by means of pendant ropes, a ladder is fixed horizontally, and over this tottering frame the travellers pass. The main ropes are so slack that the middle of the bridge is within a foot of the water, its breadth will barely admit of two persons abreast. The current beneath runs with rapidity, and it would be dangerous even to a good swimmer, to fall from this bridge into the river. The breadth of the stream, at this part, is about eighty yards, and its depth from ten to twenty feet.

Its bed is composed of large rounded stones, pebbles, gravel, and sand. In two or three places, large fragments
fragments of rock remain; but if no obstacles of greater consequence exist, to retard the navigation of this branch of the river, floats of timber, or canoes, might at all seasons find a passage through.

The town of Sirinagur occupies nearly the center of the valley; it is in length about three quarters of a mile; the breadth is much less; its form somewhat elliptic. It is formed with little attention, either to order or convenience. The houses are of stone, rough and irregularly put together, with the common earth; generally raised to a second floor; and all are covered with slate. They are so crowded as to leave little more space for the street, than is sufficient for two persons to pass one another. The principal street, and indeed the only one deserving that name, runs east and west, through the middle of the town: this is pretty broad, and is the only bazar, or market of the place.

The rajah's house is about the middle of the town, and is the largest in it; one part of it being raised to a fourth story. It is built of a coarse granite, has the appearance of being very old, is much out of repair, and exceeding shabby.

The town, viewed from an eminence, exhibits nothing striking or pleasing to the fancy.

The roads which lead into the town, excepting one, are very narrow, planted on each side with hedges of Euphorbia Canariensis, and backed with a wall of loose stones.

In a country, possessing such a variety of climate, it is natural to ask, what advantages induced the primitive settlers to prefer the burning valley to
of Sirinagur for the seat of government, to the more temperate and healthy situations in other parts of this mountainous tract. The result of my enquiries was what I expected. No other parts of the mountains, in the vicinity of the holy waters of the Ganges, possess, at the same time, an equal extent of plain ground, and convenience of a sufficient and constant supply of running water, two indispensable requisites in the formation of an extensive settlement, and particularly to settlers whose religious tenets teach them (and justly so) to consider the former among the most valuable gifts of nature; and enjoin them to a very liberal use of that blessing in the performance of some of the sacred functions of their cast.

The foundation of this rajah, by the records kept in the archives of the state, is placed at a very remote period, but they are so blended with fabulous description, that the account will hardly admit of being related, much more of receiving the sanction of authenticity.

It is stated that 3774 years before the accession of the present rajah, the country was divided into twenty-two pargunnahs, under the government of several chiefs, independent of each other, that they were united by the victorious exertions of a native of Ahmedabad Gujerat, named Bong Dhunt, who with his brother Sedje Dhunt, left their native country, to seek for better fortune: and entering the hilly tract, now called Sirinagur, took service with the rajah of the country. The former entertained in the service of the Chaandpore rajah, with whom, in a few years, he acquired considerable consequence, and was entrusted with high military authority. In this situation, at the advice of a Jougee, who appeared in a vision, he formed the ambitious design, not only of seizing the possessions of his master, but of aiming at the conquest of the whole country; and such was his success, that after deposing the rajah of Chaandpore, who was by far the most powerful in the country,
try, the rest became an easy conquest, and in the space of a few months, the whole twenty-two districts are said to have been subdued to his control, and he continued to govern them under the title of rajah of Geruwal (the ancient name of the country) during the rest of his life. Dates are wanting to ascertain the length of his reign, as also to prove who were his successors, till the fifteenth generation of lineal descent, when Adjey Paal appears. He is said to have been the founder of Sirinagur, and there fixed the seat of government, where it has continued, under a succession of sixty rajahs, including the present reigning one Purdoo Maan Saa.

At my particular request to the rajah, I was furnished with the following table of the princes who have governed this country.

<table>
<thead>
<tr>
<th>NAMES</th>
<th>Number of years reigned.</th>
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</thead>
<tbody>
<tr>
<td>Bogh-Dhunt, the first rajah, between whose reign and Adjey Paal, 900 years passed, of which no records exist,</td>
<td></td>
</tr>
<tr>
<td>Adjey Paal,</td>
<td>900</td>
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<tr>
<td>His son, Bejey Paal,</td>
<td>50</td>
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<tr>
<td>Laak Paal,</td>
<td>60</td>
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<tr>
<td>5 Dehrm Paal,</td>
<td>55</td>
</tr>
<tr>
<td>Kerrem Paal,</td>
<td>70</td>
</tr>
<tr>
<td>Narrain Deo,</td>
<td>72</td>
</tr>
<tr>
<td>Hurr Deo,</td>
<td>45</td>
</tr>
<tr>
<td>Govin Deo,</td>
<td>49</td>
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<tr>
<td>10 Raam Deo,</td>
<td>51</td>
</tr>
<tr>
<td>Runjeet Deo,</td>
<td>53</td>
</tr>
<tr>
<td>Inder Sain,</td>
<td>35</td>
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<tr>
<td>Chunder Sain,</td>
<td>39</td>
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<tr>
<th>NAMES</th>
<th>Number of years reigned.</th>
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<tbody>
<tr>
<td>Mungul Sain,</td>
<td>32</td>
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<tr>
<td>Choora Mun,</td>
<td>29</td>
</tr>
<tr>
<td>Chinta Mun,</td>
<td>33</td>
</tr>
<tr>
<td>Pooren Mun,</td>
<td>27</td>
</tr>
<tr>
<td>Birk-e-Baan,</td>
<td>79</td>
</tr>
<tr>
<td>Bir Baan,</td>
<td>81</td>
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<tr>
<td>20 Soorey Baan,</td>
<td>79</td>
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<tr>
<td>Kerreg Singh,</td>
<td>60</td>
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<tr>
<td>Sooret Singh,</td>
<td>72</td>
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<tr>
<td>Mahah Singh,</td>
<td>75</td>
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<tr>
<td>Anoop Singh,</td>
<td>59</td>
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<tr>
<td>25 Pteraur Singh,</td>
<td>29</td>
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<tr>
<td>Hurree Singh,</td>
<td>39</td>
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<tr>
<td>Jaggen Naat,</td>
<td>55</td>
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<tr>
<td>Byjee Naat,</td>
<td>65</td>
</tr>
<tr>
<td>Gookul Naat,</td>
<td>54</td>
</tr>
<tr>
<td>30 Raam Naat,</td>
<td>75</td>
</tr>
<tr>
<td>Goopee Naat,</td>
<td>82</td>
</tr>
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<thead>
<tr>
<th>NAMES</th>
<th>Number of years reigned.</th>
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<tr>
<td>Lechne Naat,</td>
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<tr>
<td>Preeim Naat,</td>
<td>71</td>
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<tr>
<td>Saada Nund,</td>
<td>65</td>
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<tr>
<td>35 Perma Nund,</td>
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<tr>
<td>Mahu Nund,</td>
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<tr>
<td>Sooka Nund,</td>
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<tr>
<td>Suba Chund,</td>
<td>59</td>
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<tr>
<td>Tarra Chund,</td>
<td>44</td>
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<tr>
<td>40 Maha Chund,</td>
<td>52</td>
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<tr>
<td>Goolab Chund,</td>
<td>41</td>
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<tr>
<td>Ram Narrain,</td>
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<tr>
<td>Gobind Narrain,</td>
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<tr>
<td>Lechnen Narrain,</td>
<td>37</td>
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<tr>
<td>45 Jegget Narrain,</td>
<td>32</td>
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<tr>
<td>Mataub Narrain,</td>
<td>25</td>
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<tr>
<td>Sheetaub Narrain,</td>
<td>37</td>
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<tr>
<td>Aunund Narrain,</td>
<td>42</td>
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<tr>
<td>Herry Narrain,</td>
<td>45</td>
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<tr>
<td>50 Mahah Narrain,</td>
<td>33</td>
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<tr>
<th>NAMES</th>
<th>Number of years reigned.</th>
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<tbody>
<tr>
<td>Renjeeet Narrain,</td>
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</tr>
<tr>
<td>Raamroo,</td>
<td>33</td>
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<tr>
<td>Chirstnroo,</td>
<td>49</td>
</tr>
<tr>
<td>Jeggeroo,</td>
<td>42</td>
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<tr>
<td>55 Herroo,</td>
<td>32</td>
</tr>
<tr>
<td>Futteh Sah,</td>
<td>39</td>
</tr>
<tr>
<td>Dooleb Sah,</td>
<td>50</td>
</tr>
<tr>
<td>Purteet Sah,</td>
<td>35</td>
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<tr>
<td>Lallet Sah,</td>
<td>40</td>
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<tr>
<td>who died in 1781, and left four sons, was succeeded by the eldest</td>
<td></td>
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<tr>
<td>Jakert Sah,</td>
<td>2 ½</td>
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<tr>
<td>and was succeeded by his brother the present Rajah,</td>
<td></td>
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<tr>
<td>Purdoo Maan Sah.</td>
<td>61</td>
</tr>
</tbody>
</table>

Total of years \(3,774\frac{1}{2}\)

The extent and limits of this *raje*, according to the information given by the rajah’s dewan, are marked on the south by *Koadwara ghat* computed forty coss from *Sirinagur*. On the north by *Buddreenaut*, called ten days journey, and on the west by *Beshaw*, thirty days journey.

The annual revenue of this country, if the rajah’s word is to be taken, does not exceed five lacks and six thousand rupees. This includes duties on exports and imports, the produce in grain, &c. working of mines, and washing of gold.
The collections on cultivation are in some places paid in kind, in others in specie, and generally in the proportion of one half of the produce of the soil.

The remittances in specie, to the capital, I believe, are very inconsiderable; for a great deal goes in the payment of the troops allowed to each district, one fourth of whom are never in employ. It is also a custom to pay, by tankhas on different districts, the troops about the capital, some descriptions of servants, and even the dancing girls and musicians who are kept in monthly hire.

Of the latter description I met several, travelling, perhaps twenty or thirty cosses, with an order on some Zemindar for three or four months arrears of pay.

The produce on washing the sands for gold does not depend on the quantity found, but upon the number employed in this business, each man undertaking this research, pays to the rajah, for that privilege, the sum of one hundred rupees yearly, and the quantity obtained is the property of the worker, without deduction.

The different places, where it is sought for, are Kerempagraag, Pacenkunda, Deempagraag, Rickercase, and Laker-ghat.

The position of these five places, from the best descriptions I could obtain, are as follows: Kerempagraag lies three days journey to the eastward of Kedirnaat, and on a small river called the Pinder, which has its source in the district called Budhaan, farther east, but here joins the Aluknundra. Pacen-

kunde
JOURNEY TO SIRINAGUR.

Jumna is on the Ganges; Dewprang at the confluence of its two branches, called Aluknundra and Baghyretty; Rickercase is on the Ganges about 120 cosses above Hurdwar; and Laker-ghtat a few cosses lower, on the same river.

At Naagpore and Dhunpore, the former forty cosses N. E. and the latter fifty cosses N. of Sirinagur, are two copper mines. These are worked eight months in the year, the richness of the ore varies much, but upon an average produces fifty per cent of pure metal; one half of which goes to the rajah, the other to defray the expense of extracting it from the mines, smelting, and paying overseers.

At Dessouly fifty or fifty-five cosses east of Sirinagur, is a lead mine, the whole produce of this goes to the rajah, and the people, who work it, are kept in constant pay, though their labour is only required eight months out of twelve, and sometimes not so long; the quantity of ore extracted being in proportion to the demand the rajah has for it. As a greater encouragement to the people who undertake the working of this mine, and in consideration of the injury to which their health is exposed, they have small portions of land given to them, on the produce of which no tax is levied by the Zemindar.

Iron is produced in several parts of the country; but particularly at Chaandpore, Belungh, Beechaan, and Cholah, but the labour of extracting it is so great, that the rajah gives up the whole to those who will work it.

Other sources of revenue are the importation of rock-salt and borax from Bootun; musk in pods, chowries, hawks male and female, from the countries bordering on Buddreenaat.
From Paenkunda comes a species of blanket called Punckee. They are of sheep's wool, of a texture resembling those sold in the Dooab and called Loocees, but stronger and finer.

From Rohilcund all kind of cotton cloths are imported, as also considerable quantities of salt, the kind brought from Lahore, known commonly by the name Nemuk Lahooree. This the Bootan people carry back in exchange for the merchandize they bring. A kind of rice is also imported from the southern countries, below the ghats, remarkable for the odour it diffuses, when boiled. It is produced in several parts of Hindustan, but particularly in the mountainous countries of Ramghur.

At the different ghats or passes into the mountains, duties on imports and some kinds of exports are levied; which, according to the best information I could obtain, is on an average about six per cent on their value, but on some particular articles, an additional duty is laid. The pass at Coadwara is rented by an officer called Hakem, who pays annually to the rajah twelve thousand rupees.

Upon the authority of the rajah's historian, this raja was, for many years, exempt from tribute to any one. In the reign of AKBAR, that prince demanded of the rajah of Sirinagar, an account of the revenues of his raja, and a chart of the country. The rajah being then at court, repaired to the presence the following day; and in obedience to the commands of the king, presented a true statement of his finances, and for the chart of the country, he humorously introduced a lean camel, saying "this is a faithful picture of the territory I possess; up and down (ooncha neechu), and very poor." The king smiled at the ingenuity of the thought, and told him that from the revenues of a country realized with so much labour, and in amount so small, he had no-
thing to demand. From that period, to the invasion of the country, by the Gorka rajah, it does not appear that tribute has been paid to any one; but on the restoration of peace, some time in the year 1792, that rajah demanded, in consideration of relinquishing all the conquests he had made in the Sirinagur country, that it should be subject to the payment of the sum of 25,000 rupees annually. This stipulation was ratified by the Sirinagur rajah, and the tribute is regularly paid. A vakeel, on his part, resides at the court of the Gorka rajah; and at the period when the tribute becomes due, an officer is sent, half way between Napaul and Sirinagur, to meet and receive it.

The standing forces of the rajah consist of about 5000 men, commonly called Peđahs: these are variously armed, according to the custom of the part of the country in which they are stationed; that is to say, with match-locks, bows and arrows, and the sword and shield: the greater number bear the latter and it is the established and favourite weapon of the country. This body of men is distributed through the several districts, to assist in the collections of the country. One thousand of the number remain at the capital. No attention is shewn either to their dress, or discipline, and they are paid with little regularity.

The natives of Sirinagur profess the Hindu religion, in the exercise of which I could not discover any variation, from the practice of the lower parts of Hindustan.

The town is inhabited by two races of people, distinguished by a difference of feature. This I am inclined to account for, by supposing that many of the natives of the lower countries have, at different and distant periods, emigrated to this part of the world, for the advantage of commerce. It is also common for men of opulence and extensive trade, in other
parts of India, to send their agents here, to establish a kind of central communication, between Bootaan and the lower Hindustan. Many of these people have settled for the rest of their lives, and their families, naturalized, and knowing no other homes, have continued, and increased. From the difference, in stature and features, between these people and the aborigines of the country, it may be concluded that they have little or no intercourse together. The latter are of lower stature, they have better proportioned limbs, faces rounder, eyes a little smaller, and noses shorter, but not flattened.

The dress of the Sirinagur mountains is seldom more, among the men, in the cold season, than a coarse thick blanket, folded loosely over the body, so as to cover all the breast, and reaching just below the knee. The legs and arms remain uncovered; on their heads they wear a small cap, and on their feet, a kind of netted sandal, made of leather thongs, with soles of thicker leather. In the hot season, they wear a kind of frock, of a coarse cloth, manufactured in the country, from the common cultivated hemp. This the women also wear, made into a close bodied kind of gown and petticoat, with sleeves to the elbow, above the breast drawing together with a string. Over all, they wear a loose cotton cloth, of lighter texture; they have seldom any other ornaments than beads of glass about their necks, and rings of various coloured glass upon their wrists.

I observed many of the natives of Sirinagur afflicted with those tumours in the neck commonly called wens: some were of a very large size, but never troublesome, or attended with pain. From my enquiries, this disorder is not general through the country, but incident only to those natives who reside near rivers which receive increase from the melting snows.
The country to the northward of Sirinagur, when viewed from one of the highest ridges, above the valley, discovers five or six ranges or broken chains of hills rising with a gradation above each other. The last or most elevated, reaches, to appearance, about half way up from the base of the stupendous Himalaya, whose snowy summits terminate the view from hence. None of the intermediate ranges exhibit the smallest appearance of snow; and though, in the winter season, those nearest to the high ridge, may receive partial falls of it, yet no part remains long upon their surfaces.

With the inclination to pay all possible deference and submission to the accuracy and judgment of Mr. Daniel, who visited this capital in 1789, yet I must here notice a remark by Mr. Rennell in his last valuable memoir of a map of Hindustan, given upon the authority of the former. The reader is there induced to conclude that a part of the base of the snowy mountains, is at a very inconsiderable distance from the valley of Sirinagur.

Mr. Daniel acknowledges, however, he trusted to the reports of the natives, who make the distance fourteen or fifteen geographic miles. But it is certainly much greater, and, I believe, cannot be less than eighty English miles.

I have observed elsewhere that in tracing the river Alukmunda from below upwards, through the valley of Sirinagur, the course is eastern; and I find, as far as the information of the natives can be trusted, that in a distance of about three days journey, it takes a more northerly direction, near a place called Roodreepraag, where it is joined by a river about half its size, called Kallee Gonga, the source of which is in the mountains near Kidaur-nauth to the north: and its principal branch from a place called Sindoo Sogur, issuing out of the rocks. From Roodreepraag the course is continued about N. E. and
at the distance of three days journey, in that direction, near Kerempraag, the Aluknuendra receives a small river, called Finder, the source of which is in Budhaan, the country bordering the rajah's territories on the N. E.

From Kerempraag, at the distance of two days journey, in much the same direction, and near a place called Nundpraag, it receives the Gurrela Ganga. This branch runs through the district of Dessouly, and has its source in the mountains to the eastward.

From Nundpraag, the Aluknuendra is said to take a more northerly direction, and at Bissenpraag, receives a river from the eastward as large as itself, called Dood Ganga, or the milk river, it also is known by the name Dhoulee. Pretty near its junction with the Aluknuendra, it runs between two villages called Gurra and Nitty.

Bissenpraag is situated near the base of the mountain, on which stands the famous temple of Buddreenaat; and is of some importance, as being the residence of the pundits and principal Hindus of Buddreenaat. Here they hold their durbars, exercise their laws and the duties of their religion, in the greatest state of security from foreign intruders, and can at any time seclude themselves from the rest of the world, by a removal of the joolahs or rope bridges, which form the communication across the Aluknuendra.

The town consists of about 800 houses, it is a place of some trade, and the inhabitants are all Hindus: my informer told me, no one of any other religion, has yet found his way to Buddreenaat, and that if I attempted the visit, it must be at the express permission of the rajah of Sirinagur. It was, hitherto, a part of my plan, to proceed as far as that celebrated spot, and I had every encouragement to believe
believe this permission would have been granted me. But I found, on the most particular enquiry, as to the nature of the road, that I should not be able to execute the journey in less than fifteen days; even without halting, for the purpose of rest, or prosecuting any enquiries, relative to the nature or productions of the country. My return, therefore, could not have been effected in time to leave the mountainous country before the commencement of the periodical rains. I consequently determined on leaving Sirinagur, and marching back by the tract I came.

The immediate execution of this plan became necessary, because the excessive heat had already begun to shew its influence upon my servants, two or three of whom were laid up with violent fevers. I therefore took leave of the rajah on the evening of the 2d, and next morning began my march towards Futtehgurh; which was accomplished, without any occurrence, that merits to be recorded.
Enumeration of Plants noticed in the preceding Tour, between Hurdwar and Sirinagar, in the months of April and May, 1796.

**MONANDRIA MONOGYNIA.**

*Costus Speciosus* of Dr. Smith.—Common to the skirts of these mountains; the stems now in a dry and withered state, the roots brought thence have since flowered. Flowers white, large, produced in a close imbricated terminal spike. Leaves sessile, in spiral like order, lanced, entire, one nerved, smooth, veinless. Calyx above, cylindrical, tubular, three cleft; divisions lanced, erect, coloured, permanent. Petals three, unequal, ovate, pointed, with the base slightly truncated. Nectary one leaved, large, waved, spreading, two lipp'd: base tubular, superior lip oblong, lanced, three toothed, shorter than the inferior, anther-bearing. Anthers oblong, two parted, adhering to the upper lip of the nectary, an inch below the point. Germ beneath, roundish, gibbous, style shorter than the nectary, filiform, placed between the anthers. Stigma headed. Pericarp, &c. as in *Lin.* crowned with the highly coloured calyx. Flowers in August.

*Cucumina.*—In the forests between Hurdwar and Coudcvara ghat, now in flower. Scape from nine to twelve inches high, crowded with yellow flowers and numerous large, ovate-pointed bracts, imbricated; and towards the extremity of the scape, highly coloured with a rose red. Leaves radical, long, and lanced, but do not appear during inflorescence.

**DIANDRIA MONOGYNIA.**

*Jasminum 1.*—With climbing stem, columnar; branches opposite, distant. Leaves simple, opposite, petiolated, oblong, ovate, acuminate, entire, smooth, four inches by one and a half. Flowers axillary,
axillary, sometimes terminal; peduncles long, slender, threadform, two or three from the same base, one flowered. Calyx very small, tubular, five-toothed; toothlets short. Corol tubular, long. Border five-parted, divisions longer than the tube, linear. Found climbing among other bushes at Dosah. *Jasminum* 2.—Leaves simple, paired, few, petioled, ovate, much rounded, entire, terminated by a short obtuse acumen; the large leaves three and a half inches long, two and a half broad. Flowers in small terminal cymes. Calyx bellied, small, five-toothed; toothlets linear, distant. Corol tubular, cylindrical. Border the length of the tube, five-parted, oblong, equal. Grows to a small tree, in the forests about Hurkaear. Flowers, white, sweet scented.

*Jasminum* 3.—Leaves alternate, pinnated with an odd one; leaflets from two to three pair, subsessile, lance-ovate, entire, smooth, the lower ones least, terminal one largest, eleven lines by five, but variable. Petioles angular. Peduncles terminal, slender, one flowered. Calyx small, bellied, five-toothed; toothlets, awled, small, distant. Corol tubular, long. Border five-parted, divisions ovate, shorter than the tube, spreading. Branches angular, straggling. Found on the side of a watercourse, between the mountains at Akeaanee, grows to a large bush, flowers yellow, and very sweet.

*Justicia Thyrsiformis.*—Leaves opposite, petioled, elliptico-lanceolate, entire. The flowers are produced on thyrse-like terminal spikes, intermixed with numerous oblong bracts, ringent, and of a dull orange colour. It comes nearest to *Justicia Coccinea* of Dr. Smith, in 2d *Fas.* No. 8. The trivial name is added on the opinion of Doctor Roxburgh. It grows to a large strong bush on the sides of the Koa-nullah, near Amsour.

*Salvia integrifolia.* — Leaves opposite, sessile, sub-ovate, entire, woolly, mostly from the lower part of
of the stem. Flowers in whorls; of a light blue, about six in each whorl. Calyx two lipped, the upper lip three toothed, the lower two toothed, and twice longer; the mouth much enlarged. Grows among stones, with a strong fibrous root, difficult to withdraw. Stem herbaceous, about a foot high, angular. The natives gather the young flowers and dress with their common food. The specific name is given on the opinion of Doctor Roxburgh.

**TRIANDRIA MONOGYNIA.**

*Valeriana.*—Leaves various, those of the root hearted, obtuse intire; petioles semicylindrical, long, downy, stem leaves sessile, more pointed, sometimes slightly lobed at the base. Flowers triandrous, of a pale pink and white, in compound terminal umbels. Seeds crowned with a twelve-rayed pappus. Root fleshy, sending forth many long slender fibres, soon after taken out of the earth, becomes highly scented, which it retains as long as in a vegetating state. It is found in several parts of the mountains, affects moist and shaded situations, is herbaceous, grows to about eighteen inches high, very slender. It seems to differ only in the root from the *Jatamansi* of Doctor Roxburgh, to which these have no resemblance.

**TETRANDRIA MONOGYNIA.**

*Ixora tomentosa* of Doctor Roxburgh.—Found in the neighbourhood of Ghinouly, near the Koa-nul-lah, acquires the size of a pretty large tree, though of deformed growth, now in flower. Flowers white, numerous.

**PENTANDRIA MONOGYNIA.**

*Androsace, rotundisolia.* — A beautiful little herbaceous plant, found in great abundance on the most elevated ridges of mountains, one day's journey
journey S. W. of Sirinagar. Leaves radical, petioled, subrotund, irregularly sinuated. Petioles very long, villous. Flowers about the size of a cow-slip, in umbells, a pretty mixture of white and red, with tints of yellow. Involucre, many leaved, the leaves toothed. Perianths, unequal, in some flowers larger than the coroll, many scattered hairs mixed with the flowers.

*Lonicera quinquelocularis.*—A pretty large bush, with long slender branches. Leaves opposite, petioled, ovate, pointed, sometimes elliptical, entire. Flowers axillary, on short solitary peduncles, each peduncle raising two sessile florets. At the base of the florets, a one-leaved bract, or rather, I think, common calyx, two parted, divisions ovate, concave, coloured. Proper perianth above, small, five toothed, coloured, withering. Coroll, one petalled, tubular. Border two parted, or two lipp’d; upper lip oblong, obtuse, entire, reflected; lower more than twice broader, four toothed. Pericarp in an half ripe state, appears to be a capsule, five celled, with about five small, ovate, red seeds in each cell. Doctor Roxburgh considers the characters of *Lonicera* and *Hamellia* united in this plant, but thinks the irregular coroll will fix it as a specimen of the former, and to the second section thereof, and comes nearest *Xylosteum*, but the five celled capsule, and very short common peduncle precludes the idea of their being the same. It grows in the vallies about Adewaunee.

*Verbascum Thapsus.*—In the valley near Dosah; a robust plant, from four to five feet high, and from the profusion of its yellow flowers, very showy. The natives have a superstitious notion of the efficacy of this plant in protecting them from the visitations of evil spirits. It is known by the name *Aakul-bor*, or ver.

*Datura, Stramonium.*—In every part of the mountains, where villages are found. The natives are well acquainted with its narcotic powers, and infuse
the seeds to increase the intoxicating powers of their common spirituous liquors. The capsules they use as a suppurative. *Datura* is also the name of this plant, in most parts of *Hindustan*; and probably has been carried from the east, to the western world.

*Ehretia Tinifolia.*—Found both above and below the ghauts—grows to a pretty large tree, now in flower, ripens its fruit about the end of May. The berry is about the size of a pepper corn, one celled, four seeded, of an orange yellow insipidly sweet. The natives pickle the unripe berries in vinegar, and eat with their common food.

*Vitilago.*—Leaves alternate, petioled, two faced, oblong-ovate, acuminated, slightly serrated, serratures wide, unequal: petioles very short, cylindrical, downy. Panicles terminal, peduncles, downy. This plant climbs over other trees with a strong contorted stem. The natives of the mountains apply the bark in a green state, to many useful purposes, as cordage.

*Celastrus Scandens* 1.—In most of the forests about Hurduck, and vallies above the ghauts.

*Celastrus* 2.—Leaves alternate, petioled, subrotund, acuminated, serrulate, smooth. Branches slender, cylindrical, spotted. Flowers, in terminal dichotomous, panicles, very small, pale green. Grows to a small tree—in the valley about Dosah and Ghinouly.

*Cedrela.*—The tree commonly called *Toon*, described by Sir *William Jones*, in *A. R.* vol. IV, page 281, is found in the forests bordering the mountains below the ghauts. Grows to a tall tree, but seldom of considerable thickness. Is more in esteem for household furniture by Europeans, than for any use the natives put it to; bears resemblance to mahogany, but of much coarser fibre.

Doubtful genus coming nearest to *Hirtella.*—A small tree on the verge of a rivulet, a few miles S. W. of Sirinagur, near the road. Leaves diffuse, petioled, ovate, entire smooth. Petioles long, cylindrical, highly
highly coloured, of a dark shining red, the nerves and veins of the leaves, young branches and leaves coloured in the same manner. Flowers very small, produced on terminal compound diffuse panicles. Peduncles long, very slender, filiform, hairy, stained. Calyx beneath, five cleft, divisions equal, ovate pointed. Corol, five petals, equal, ovate, obtuse, filaments five, very short. Germ, reniform, compressed. Style from the depressed margin of the germ, very short. Stigma simple, a little depressed. Pericarp, resembles a legume, about the size of the seed of Ervum-lens, reniform, containing one seed of the same shape, attached to the suture of the valve.

Vitis.—Leaves agree pretty well with the description of v. Indica, except that in this plant, they are extremely hoary on both sides, white beneath, brown above, five nerved. The petioles, peduncles, and cirri, are also very hoary. Grows in dry situations in the forests about Dosah and Belkate, now in flower.

Gardenia Uliginosa 1. Roxburgh.—Grows to a large tree in the forests on the borders of the mountain, between Hurdwar and Coadwara. The flowers hexandrous, very large, coriaceous, of a cream white. It is found also in the lower parts of Rohilcund near Futtehgurh, flowers in the month of June.

Gardenia 2.—A small tree in the vicinity of Hurdwar, thorny, branches opposite and thorny, thorns opposite, diverging, rigid straight, one terminating the branch, an inch or more in length. Leaves obvate, attenuated at the base, half sessile, bundled, three or more entire. Flowers mostly hexandrous; of a yellowish white mixed with green, scattered about the extremities of the branches, sessile; during inflorescence, few leaves on the tree, and those of the preceding year, ripe fruit remaining, about the bigness of a middle sized orange, orbicular; resembles more a drupe than berry. Seeds numerous,
rous, nestling in a softish pulp, contained in a hard
five or six valved shell, and this enveloped in a
spongy fleshy pulp, half an inch thick, of a green-
ish white within, externally of a brownish ash, and
smooth.

**Gardenia 3.**—A plant of humble growth, shrubby,
none seen exceeding two feet in height, growing
among fragments of rocks on the elevated ridge
near Chichooa. Leaves terminating the branches,
without order, rather crowded, petioled, mostly
obovate, entire, smooth, one inch by half an inch,
petiole very short. Flowers axillary, single, on
solitary short peduncles, of a greenish white colour,
and very sweet to the smell. Perianth above, one
leaved, half five cleft, divisions awled, erect, per-
manent. Corol, funnel form, tube long, widening
upwards, partly closed about the middle by a ring
of silky down. Border five-parted, divisions ovate,
equal. Filaments short, within the tube. An-
thers oblong, partly within the tube. Germ glo-
balar. Style length of the tube. Stigma two
lobed, lobes, ovate, flattened, appressed. Pericarp,
a berry crowned with the calyx, about the size of
a common pea, one celled, four seeded.

**Nerium reticulata. 1.**—A strong climber, about the
trees near Amsour.

**Nerium 2.**—With leaves opposite, petioled, ovate,
pointed entire, downy; petioles very short, gib-
bous: follicles two, long, a little compressed,
breadth of the forefinger. The flowers terminate
the branches, on four or five short divided pedun-
cles, about the size of a primrose, of a greenish
white, very sweet scented. It is found in plenty
in the forests at the foot of the ghaut. Both flow-
er and fruit now on the tree. The nectary in this
species differs from the generic description; it is
here composed of twelve yellow tridentated scales,
about half the length of the stamens, neither are
the anthers terminated by threads, but rigid at the
apices. I have called it a *Nerium* in deference to
the
the judgment of a better botanist, but it will bear comparison with the next genus *Echites*, I think. *Echites Antidysentricum*. Rox.—A small tree in the forests about *Hurdwar*. Leaves opposite, half or sub-petioled, ovate, oblong, pointed, entire, waved, smooth, shining, one nerved, with many pairs of lateral, parallel, ribs. The *Linnean* characters of the fructification, do not strictly agree with this plant. The nectary is here wanting. Anthers almost at the bottom of the tube, filaments, scarcely any. The follicles agree with those of *Nerium Antidysentricum*. The seeds are in great repute among the natives of *Hindustan* as a vermilifuge.

Genus not determined.—A small tree, or rather large bush, growing by the road side near *Teyka-ka-Mandua*. Leaves about the tops of the branches, irregularly opposite, petioled, ovate, variously pointed, serrated, smooth, one nerved; petioles short. Flowers panicled about the ends of the branches—yellowish, with many brown veins, more coloured above. Calyx five cleft, expanding, the divisions slightly lacerated at the edges, rounded, coloured. Corol, five petaled—petals oblong, ovate, obtuse, twice larger than the calyx, with a short claw. Filaments five, shorter than the corol, enlarged below, and resembling the germ, slightly coalescing at the base into a ring. Anthers oblong, erect. Germ above, orbicular, smooth, the size of the glandulous base of the stamens, in the center of them. Style the length of the stamens, filiform, stigma simple, truncated. Pericarp, not seen.

**PENTANDRIA DIGYNYA.**

*Apocynum*.—A strong climbing bush, spreading itself with much profusion over the under wood of forests between *Dosah* and *Sirinagur*. The flowers numerous, pure white, and highly scented, size of a primrose, branches cylindrical, opposite, leaves in the same order, petioled, lance-ovate, entire, smooth; petioles short. Calyx five-parted, small, lanced, downy. Corol one petaled, wheeled, tube,
length of the calyx. Border five cleft, segments, equal, rounded, spreading. Nectary, five glandular bodies, surrounding the germ, filaments five, short, compressed, internally downy, anthers rigid, oblong, pointed, converging, cleft at the base. Germs two. Style length of the stamens, stigma oval, compressed, two lobed, attenuated. Pericarp, follicles two, oblong, bellied, pointed, smooth, one celled, one valved, seeds numerous, imbricated, compressed, crowned with long silky pappus. It bears some affinity to the genus *Echites*. It is also found in several parts of *Rohilcund* and the *Dooab.*

*Asclepias* doubtful.—A shrubby climber, now coming into flower—branches cylindrical, smooth, opposite. Leaves opposite, heart ovate, much rounded beneath, pointed above, petioled. Flowers in axillary nodding cymes, of a pale green. Calyx five-cleft, small, villous, divisions ovate, equal, spreading. Corol flat, border five-cleft, segments broad, obtusely ovate. Nectary, five glandular corpuscles, into which the anthers are inserted without filaments. Germs two, styles none. Pericarp not seen, therefore its place in the system yet doubtful. Found near the ghat of *Coadwara*.

*Herniaria*, doubtful.—A shrubby bush, with numerous slender stems and branches, andcovered with a profusion of minute yellow flowers. Leaves alternate, petioled, ovate, rather elliptical, entire, smooth, petioles short. Calyx five-parted, divisions unequal, erect, coloured. Corol none. Nectary, five minute glandulous, three toothed scales, surrounding the foot of the styles. Filaments five, capillary, longer than the calyx, erect, inserted into the base of the calyx. Anthers, simple, erect. Styles two, filiform. Stigmas simple, recurvated. Germ too minute for inspection in its present state, and as the pericarp is not yet seen, future observation must determine the genus yet doubtful. Many bushes of it grow in the forest about *Coadwara*—it was observed in the middle of *May*, therefore we may
may conclude the month of June would be a fitter time for the examination.

Gentiana Nana.—Growing and flowering, in much abundance and beauty, on the elevated mountains near Chichooa.

PENTANDRIA TRIGYNIA.

A slender twiggy climbing plant, on the mountains near Hurduwar. Branches alternate, columnar, smooth, scattered. Leaves alternate, shortly petioled, ovate, oblong, attenuated, sometimes a little hearted at the base, entire, smooth, distant. Near the termination of each branch is generally one simple cirrus. Flowers terminal, sometimes axillary, in slender diffuse panicles, rather inconspicuous, and very small. Calyx, one leaved, half five-cleft, divisions equal. Corol none. Stamens five, little longer than the calyx. Anthers twin. Germs three, orbicular, smooth, very small. Style one, the length of the stamens. Stigma headed, five-cornered. Pericarp.

PENTANDRIA PENTAGYNIA.

Linum trigynum. Roxb.—A plant well known in our gardens at Caenpore and Lucknow, by the name Gul-ashurfice, is a native of the high mountains, between Natauna and Adwaanee. It is perennial, shrubby, grows to a spreading bush about four feet high, stem and branches erect, slender, piped. It makes a handsome appearance with its numerous yellow flowers in March and April, would doubtless by some care thrive in the climate of Britain.

HEXANDRIA MONOGYNIA.

Berberis Illicifolia.—Grows in plenty in the valley through which the Koa-nullah has its course, now full in flower, and green fruit. The fruit when ripe is black, and eat by the natives. The wood is of a deep
deep yellow, and used in dying, but under the management of the natives the colour is not permanent.

HEXANDRIA TRIGYNIA.

_Rumex Aegyptius and Rumex Acetosella._—Along the sides and dry parts of the Koa-nullah.

OCTANDRIA MONOGYNIA.

_Polygonum Convolvulus._—Growing along the sides of the Koa-nullah. In some parts of these mountains it is cultivated for common food among the poorer natives.

ENEANDRIA MONOGYNIA.

_Laurus Cassia._—Grows to the size of a small tree, on the sides of the mountains, near the roads to the northward of Belkate. In addition to the Linnean generic characters, noticed. Petals hairy, anthers the length of the filaments, slightly compressed, four celled, four valved, or with four lids, which on the exclusion of the pollen, fly up, and leave the cells very distinct.

DECANDRIA MONOGYNIA.

_Bauhinia Scandens._—Growing on the skirts of the forest along the Ganges, near Hurdwar, spreading itself most profusely over the heads of every other tree; and mostly concealing with its broad leaves, the foliage and branches of the trees on which it climbs. The flowers are a mixture of white and cream colour, produced on simple terminal racemes. Stamens unequal, three only fertile. Legume large compressed. Found also on the mountains above the ghats.

_Bauhinia Variegata._—Common to the mountains; also a variety with milk white flowers, both in flower.
Guilandina Moringa.—In the forests at the foot of the mountains. Trees very large and numerous, now in fruit only.

Murraya Exotica.—Growing to the size of a large bush in the valley near Amsour, now in flower.

Melia Azadirachta.—Grows to a large spreading tree in the forest near Coadwara, now in flower.

Doubtful.—Growing near Coadwara at the foot of the ghat, and in the neighbourhood of Hurdwar, a large spreading lofty tree, full in flower, the young leaves just starting forth; these are pinnate: leaflets from five to six pair, with an odd one, sessile, ovate, pointed, serrated. Flowers of a pale yellow, varied by tints of brownish orange from the coloured calyxes, produced on terminal compound racemes. Calyx one leaved, pitchered, coloured, mouth five-cleft, expanding, withering. Corol petals five, lance-linear, alternate with the divisions of the calyx, and inserted into the sinuses. Stamens, filaments ten, awled, hairy, the alternate ones shorter, inserted into the calyx, anthers oblong, furrowed. Pistil, germ above, roundish, slightly depressed. Style thread-form, the length of the calyx, hairy, partly coloured. Stigma, headed, depressed, five-cornered. Pericarp drupe, dry, orbicular, with distant rounded angles, depressed. Seed, nuts five, size of a small peppercorn, roundish, hard, furrowed, each containing one seed, of the same form. It comes nearest to Quisqualis, and if it cannot be admitted there, will probably form a new genus.

Doubtful.—Growing in forests of oak on the high ridge of mountains near Adwaanee, a large tree, just now conspicuous, for its abundant display of large crimson flowers, leaves without order about the upper part of the branches, petioled, lance-oblong, entire smooth above, hoary white beneath. The flowers, are produced on terminal simple racemes. Calyx one leaved, very small, coloured, five toothed, toothlets obtuse, the two superior
ones larger, deciduous. Corol, one petaled, large, tubular, bell mouthed, tube very wide, contracting at the case. Border five cleft, divisions broad, unequally end nicked. Stamens, filaments ten, of unequal lengths, the longest the length of the corol, erect, appressed to the sides of the germ. Anthers oblong, thick, incumbent. Germ above, columnar, hoary, marked with the pressure of the stamens. Style longer than the stamens. Stigma headed, round, depressed. Pericarp, capsule, columnar, ten celled, many seeded. It approaches nearest to *Rhododendron*, but will probably not be admissible there; and, perhaps, will form a new genus. The natives called it *Boorans*, the wood is used for making the stocks of matchlocks. *Arbutus* doubtful.—A tree of medium size found in forests of fir, oak, &c. between *Nataana* and *Adwaanee*, crowded racemes of white monopetalous flowers, terminal and drooping. Leaves alternate, petioled ovate, pointed, entire. Calyx half five-cleft, small, divisions ovate, erect. Corol pitcher-ed, many times longer than the calyx, bellied, neck very narrow; mouth five toothed, toothlets equal, short, obtuse. Stamens, filaments ten, sometimes longer than the coral, and confined by the narrowness of the neck within it, awled, thick at the base, somewhat hairy, inserted into the base of the tube. Germ above, globular, seated on a five-cornered fleshy receptacle. Pericarp (in an unripe state) berry five-celled, many seeded. The natives call the tree *Aiaar*, and apply the expressed juice of the leaves with much success in cutaneous eruptions.

**DECANDRIA TRIGYNYA.**

searches, grows in great abundance in several parts of the mountains, but particularly on the banks of the Koa-nullah near Dosah, climbing profusely upon other trees, and beautiful in display of its crowded racemes of flowers.

DECANDRIA PENTAGYNIA.

*Spondias Myrobalanus.*—A forest tree between Am- sour and Ghinouly, now in flower.

*Sedum Album.*—Growing out of the interstices of stone walls, laid against the slopes of mountains, to retain the soil from washing down. The white flowers have tints of pale red, and make a pretty show in so humble a plant.

*Oxalis Acetosella.*—On the heights of Chichooa, on a small spot of pasture.

*Cerastium Alpinum.*—About Teyka-ka-Maanda.

Doubtful.—Found in the neighbourhood of Adwaa- nee. A slender bushy shrub. Leaves opposite, sub-petioled, lance-ovate, sometimes obtuse, serrulate, rough, downy beneath. Calyx one-leaved, belled: border half five-cleft: division equal, ovate, pointed, erect. Corol, petals five, ovate, cut off at the base, equal, about twice longer than the calyx, spreading. Nectaries, ten oblong, compressed, erect scales, forming a coronet, but not conjoined; as long as the petals, the alternate ones less, broadest at their apices, and widely notched, staminiferous, seated on the germ-covering receptacle. Stamens, filaments ten, very short, filiform, of which five are inserted into the apices of the longest nectarious scales, and five into the sides of the shorter, about the middle. Anthers globular, four cornered, alternately less, erect. Germ above, globular, covered with a fleshy depressed ring. Styles five, filiform, length of the petals, approximated, rising through the middle of the germ-covering receptacle. Stigmas simple. Pericarp (in an unripe state) capsular, round, five-celled. Seeds numerous, attached to 1 a recep-
a receptacle in each cell. It will most likely form a new genus. The flowers are white, on terminal, solitary racemes, and scattered.

**DODECANDRIA MONOOGYNIA.**

*Caritaevia Tapia.*—A forest tree in the neighbourhood of the mountains, and now in flower.

*Grislea-tomentosa,* Dr. Roxburgh.—In great plenty about Hardwar, and the interior part of the mountains. The flower used as a cooling medicine by the natives, and as a colouring drug in combination with the root of *Morinda Citrifolia* in dying red, as described by Dr. Hunter, in *Asiatick Researches,* vol. IV.

**DODECANDRIA TRIGYNIA.**

*Euphorbia-Canariensis.*—In several parts of the mountains.

**ICOSANDRIA MONOOGYNIA.**

*Punica-granatum.*—Growing on the sides of the mountains, between Belkate and Nataana, two or three small trees, now in flower; the fruit never eatable the natives say; called by them *Daurmee-Kutta.*

*Prunus.*—A cherry tree, of common size, found in several places, between the mountains. Leaves irregularly alternate, petioled, serrulated, smooth, shining, with two globular glands at the base.—The fruit in clusters, about the size of the black *Hertfordshire* cherry, of a roundish oval, acid and astringent in a ripe state, and of a dull red colour. The nut furrowed and thick. The wood is in much esteem among the travelling *Fakeers* for bludgeons and walking sticks, and known in common by the name of *Puddum.*

**ICOSANDRIA DIGYNIA.**

*Crataegus.*—Growing among detached rocks on the high
high mountains near Chichooa. Stem woody, slender, procumbent. Branches without order, mostly two-faced, columnar, terminating with an obtuse rigid point. Leaves, the youngest fascicled, when more advanced appear alternate, petioled, wedge-form, sometimes ovate, entire, hairy beneath, smooth and shining, above five-eighths of an inch in length, including a petiole of one-eighth. Peduncles axillary, solitary, one-flowered, short, hairy, Calyxes hairy.— Flowers white, fragrant. Berry, size of a common pea, red when ripe.

**ICOSANDRIA PENTAGYNIA.**

*Pyrus.*—With branches alternate, slender, cylindrical. Leaves, about the ends of the branches, long-petioled, ovate, acuminate, serrulate, smooth. Peduncles solitary, cylindrical, long, erect, intermixed with the leaves. Fruit globular, size of a pigeon's egg, of a russet-brown, spotted, harsh to the taste, and stony. Grows to a small tree in several parts of the mountains between Nataana and Adckanaee. Flowers in March.

*Spiraea?* doubtful.—Leaves alternate, oblong, ovate, petioled, entire towards the base, obscurely crenate upwards, sometimes entire. Corymbs terminal. Flowers small, numerous, of a yellowish white. Calyx, corol, stamens, and pistil, not materially differing from the *Linnian* characters; but to these must be added in the present species—Nectary twelve small, fleshy, compressed, oblong scales, covering the base of the stamens, and united below to the side of the calyx, emarginated above. Pericarp not seen. Grows to a slender tall twiggy bush. Found a few miles S. W. of Sirinagur, near the village of Nandaala. It most resembles *S. Crenata* of Linnaeus.

**ICOSANDRIA POLYGYNIA.**

*Rosa.*—Stems numerous, smooth, thorny. Leaves alternate.
alternate. Petioles thorny, pinnated, from three to five pair of leaflets with an odd one, ovate, pointed, smooth, serrated. Germ ovate, smooth. Peduncles hispid. Flowers pure white, in great profusion, and highly fragrant, resembling in smell the clove. Very large bushes of this rose are found in the valleys of these mountains, called by the natives Koonja.

**Rubus.**—Numerous straggling bushes, found most part of the way between Coadwara ghat and Sirinagur, producing yellow fruit the size of the common red raspberry, of an agreeable acidulated sweet, and which affords a most acceptable means of relieving the thirsty traveller. The stems, branches, and petioles, are very hispid, and armed with short recurvated prickles. Racemes terminal. Flowers white. Leaves alternate. Leaflets ovate, pointed, serrated. Called by the natives Gowry-phul.

**Rubus Idaeus.**—Found in oak forests, a few miles S. W. of Sirinagur, and in the valley of Sirinagur. Flowers of a pink red. Fruit, agreeable to the taste, but possessing, in a very small degree, the flavor of cultivated raspberry. The stems and branches smooth, armed with strong recurvated prickles, as also the common petiole. Leaflets, from three to five pair, with an odd one. Sessile ovate, deeply serrated, white beneath.

**Fragaria Sterilis.**—On the sides of those mountains which are much shaded, and soil rich.

**Potentilla fragarioides.**—On the mountains about Nataana.

**Potentilla reptans.**—On the high ridge near Chichooa.

**POLYANDRIA MONOGYNIA.**

**Lagerstroemia Montana, Roxburgh.**—This tree grows to sixty or seventy feet high. Stem straight, thick, and clear of branches to a great height (forty feet). Flowers with much beauty in the month of May. Grows both above and below the ghats. Trees not numerous.
Doubtful.—Found between Adwaanee and Teyka-ka-Muanda, a small tree thickly covered with flowers of a yellowish white, and so fragrant as to be evident to the senses at a considerable distance. It bears the following characters. Leaves alternate, petioled, ovate, serrated, about the base almost entire, smooth above, nerves hairy beneath. Petioles very short, channelled hairy. Racemes rather simple, terminal, and from the axills of the leaves, numerous. Peduncles hairy. Calyx perianth, one leaved, half five-cleft, coloured: divisions thin, obtusely ovate, rather unequal. Corol, petals, five, ovate, rounded, two a little less, slightly adhering to each other at the base. Nectaries, five rounded, compressed glands, sitting on the germ, surrounding the style. Stamens, filaments thirty or more, longer than the corol, unequal, slightly attached in parcels to the base of the petals. Anthers roundish, erect. Germ beneath. Style shorter than the filaments, thicker, compressed. Stigma headed, depressed. Pericarp (in an unripe state) two celled, in each two or three ovate seeds. It has most affinity, perhaps, with the genus Tilia, except in the pericarp, and on the examination of this, when it can be obtained perfect, we must depend to ascertain its place in the system.

POLYANDRIA POLYGYNIA.

Uvaria.—Near Coadwara, above the ghauts, a very lofty tree.

DIDYNAMIA GYMNOSPERMIA.

Ballota.—A bushy half shrubby plant on the side of the mountains, and near the road descending into the valley of Belkate. About three feet high, seemingly annual, stems and branches four cornered. Leaves opposite, petioled, ovate, acuminate, serrated, (teeth distant, deep, obtuse), downy, veined. Flowers axillary. Peduncles very short, solitary, six flowered, have the appearance of verticels, bracted.
bracted. Calyx tubular, long, ten striated, bell-mouthed: border five-parted: the divisions sub-ovate, veined, leaf-like, as long as the tube, erect. The rest of the fructification not differing materially from the generic characters of Linnaeus. The whole plant is extremely bitter, and used by the natives in watery infusions as a stomachic.

**DIDYYNAMIA ANGIOSPERMIA.**

*Bignonia Chelonooides.*—Grows to a pretty large tree in the neighbourhood of Hurdwar and Coadwara. Nothing remains to be said in addition to the minute description given of this plant by the late Sir William Jones, *Asiatick Researches*, vol. IV.

*Gmelina Arborea.*—A large spreading tree in the neighbourhood of Hurdwar, and forests on the skirts of these mountains, now in flower, the fruit ripens about the end of May. The wood is light, and used by the natives of Hindustan for making the cylinders of those drums called *Dholuks*. Name of the tree *Kum-haar*.

*Volkameria? bicolor.*—A very handsome species, (if a *Volkumeria*) the trivial name taken from the party-coloured corol, one division of which is of a fine blue, the other pure white. Racemes terminal, compound, large. Leaves opposite, petioled, from six to ten pairs on a branchlet, ovate, lance-acuminated, entire towards the base, above, (as far as the acumen), serrated. The calyces and seeds of this plant are highly aromatic. It grows in abundance in several valleys of these mountains, now in full flower, and ripened seeds.

*Vitex trifolia.*—Common both above and below the ghauts.

**MONADELPHIA MONOGYNIA.**

A tree in the forests near Coadwara, now in fruit, a large berry, as big as a common sized lemon, and somewhat of that shape, growing in close clusters,
ters, five or six, sessile, and crowned with the enlarged permanent calyx, some retaining the whole of the dry fructification, perfect enough for examination, and which exhibit the following characters. Calyx four-parted, above: divisions ovate, obtuse, concave. Corol, petals four, rather obovate, oblong, twice the length of the divisions of the calyx (1 inch $\frac{1}{2}$), truncated at the base, stamens, filaments very numerous (300), capillary conjoined below in a ring, and scated on the receptacle covering the germ. Style longer than the stamens, thicker, filiform. Stigma headed. The berry is composed of a spongy whitish pulp. Seeds, six, eight, or more, nestling, about the size of the seeds of a citron, and of that form, a little compressed. Leaves, terminating the branches, subsessile, sub-rotund, attenuated at the base, ending in a short acumen above, serrated large, a perfect description and figure of this plant, may be expected from the extensive and invaluable collection of Mr. R. Bruce, where it has been for some years, and forms one of the many new genera, wherewith that gentleman is about to enrich the science of botany.

**MONADELPHIA DECANDRIA.**

*Geranium.*—A very slender herbaceous kind, growing among weeds and bushes on the highest mountains about Nataana. Leaves petioled, from three to five lobed, lobes trifid; petioles very long, filiform. Peduncles axillary, solitary, resembling the petioles, one flowered. Flowers pale rose, with a deep purple eye at the base of each petal.

**MONADELPHIA POLYANDRIA.**

*Bombax Ceiba.*—Grows in the vallies of these mountains to a very considerable tree, none exceeding it in size, and regularity of growth: its wood is converted to many uses, where lightness more than strength is sought for. For the scabbards of swords, it is much used, and canoes of large size
size are hollowed from its trunk. A variety of this tree is also found with flowers of a reddish yellow, the petals, oblong ovate.

*Bombax Gossypium.*—A small tree, a great ornament to the sloping sides of the mountains in the vicinity of Hurdwar, the flowers yellow, large, and conspicuously bright, on simple terminal racemes, no leaves during inflorescence. The wood of this tree resembles, for its lightness, that of *Bombax Ceiba*, and the young branches abound in a transparent white mucilage, which is given out on immersion in cold water. Seeds sent to the botanical garden in Calcutta have come up.

**DIADELPHIA DECANDRIA.**

Robinia 1.—A large tree with spreading bushy head, leaves pinnated, leaflets petioled, two pair with an odd one, large, ovate, entire, shortly acuminate, smooth, shining. Racemes axillary, simple, large and showy; flowers white mixed with pink. Peduncles common, columnar, long; proper, short, one-flowered. Legume short, between oval and kidney shape, turgid, a little compressed, one seeded, seed more reniform, compressed, covered with a dark brown arill. The leaves, racemes, &c. have an unpleasant smell. The natives apply the expressed juice of the unripe legumes, as a remedy for the itch. The tree is called by them *Pitpapra*, is found both below and above the ghats.

Robinia 2.—With woody climbing stem and branches, leaves pinnated with an odd one, leaflets from three to five pair, with short gibbous petioles, oblong ovate, (five inches by three) obtusely pointed, entire, common, petioles very long, downy. Racemes terminal, simple, flowers of a dull white. Peduncles downy. Legumes, oblong, linear, compressed, smooth. Seeds about six, compressed, of a roundish kidney shape. The ripe legumes fly open with considerable force, and noise, and take a twisted form. It is common in every forest above the ghats, is found also along the banks
NOTICED IN THE PRECEDING TOUR.

banks of the Ganges, as low as Fatehganj, where seeds are probably brought by the current, and lodged, not being found in the jungles of the Dooab.

Robinia 3. Doubtful.—With strong contorted stem, twenty inches circumference, climbing over the highest trees in the forests about Hardwar, now without leaves (April), but loaded with long terminal pendulous racemes of blue and white flowers. Peduncles columnar, downy, proper, one flowered. Legumes long, sub-linear, compressed, pointed with the persisting style, hairy, adhering to the skin when handled, and slightly irritating. Seeds about six, kidney shape, compressed, smooth, varying in colour, size of those of Ervum-lens. The parts of fructification agree best with the characters of Robinia. The leaves not yet seen.

Pterocarpus — The common tree in the forests, on the skirts of these mountains, delights in a flat, rich soil. Is a timber of extensive use, hard, durable, and handsome, well known in Hindustan, under the name of Scessoon.

POLYADELPHIA POLYANDRIA.

Hypericum.—An under shrub, of much beauty, on the elevated hills, between Bosay and Bedeyl. Grows to about three feet high, branches numerous, cylindrical, smooth, all terminated with corymb-like clusters of large yellow pentagynous flowers. Leaves opposite, sessile, oblong, oval, entire, smooth, the large leaves about three and a half inches by one and a half. Capsule five-celled, many seeded; seeds oblong.

SYNGENESIA POLYGAMIA AQUALIS.

Prenanthes.—A very pretty half shrubby species, growing out of the hard clay banks of the Ganges, near Hardwar, stems numerous and procumbent, very leafy, and marked with the vestiges of fallen leaves.
leaves. Flowers in corymb-like panicles, terminating the branches, a pretty mixture of white and red, florets five-fold. Leaves without order, petioled, obovate, widely serrated; entire towards the base. Seeds five, crowned with a hairy pappus, seated on the naked receptacle.

On the sides of the mountains between Dosah and Belkate, a small tree, with black fissured bark, irregular crooked branches. Leaves about the ends of the branches without order, petioled, elliptical, one-nerved, entire, about six inches long, white beneath, with a dense cottony down, smooth above; petioles and peduncles, downy, like the leaves. Flowers in cymes terminating the branches, possessing the following characters. Calyx oblong, formed of about twelve unequal imbricated lance-shape scales, increasing in size from the base, the interior series much longer, erect, and retaining the florets. Corol compound, tubular; corollets hermaphrodite, constantly four equal. Proper, tubular, slender, longer than the calyx; border five-cleft; laciniae long, linear. Staminens, pist, &c. as in the genus Cacalia. Seeds solitary, oblong, attenuated at the base, silky pappus hairy, stiff, erect, the length of the stamens. It comes nearest to the genus Cacalia, and to C. Aselepiadea.

Leontodon taraxacum.—On the high mountains near Chichooa.
Hypochoeris-glabra and Hypochoeris-radiata.—On the mountains about Teyka-ka-Maanda and Chichooa.

SYNGENESIA MONOGAMIA.

Lobelia Kalmii.—On the sides of the mountains near Dosa.
Viola-palustris.—On the sides of the mountains between Adwaaanee and Teyka-ka-Maanda.
Impatiens Noli-tangere.—In the bed of the Koa-nulalah, a showy handsome plant, now in flower.

GYNANDRIA
GYNANDRIA DIANDRIA.

**Limodorem.**—In the low grounds near Asop-gurh, below Hurdzvar. Bulbs solid, large, smooth, mostly triangular, the corners pointed, sending forth a few fibres; scape simple, from the middle of the bulb, columnar, smooth; erect, about twelve inches high. Flowers scattered: petals obovate-linear, nearly equal; nectary three-cleft, the middle division much larger, rounded. It resembles *L. Viridens* of Doctor Roxburgh.

**Epidendrum 1.**—Leaves two ranked, sessile, sheathing the stem, obovate-linear, carinated, ending as if cut off. Racemes axillary, simple, drooping: peduncles as long as the leaves, cylindrical; proper, one flowered. Flowers scattered, large, white mixed with pink, and very fragrant. Bracts lanced, concave, coloured, one to each proper peduncle. Nectary, horn-shaped, incurvated. It adheres to the stems of trees, by many strong fibres shooting forth from among the leaves. It approaches nearest to *E. furcata*.

**Epidendrum 2.**—Leaves radical, sessile, lanced, entire, succulent, the interior margin of each leaf, near the base, is split open longitudinally, forming a sheath which receives the edge of the adjoining leaf: leaves seldom exceeding one inch and a half in length; racemes simple, from the centre of the leaves, but little longer, slender, many flowered. Capsule six-angled, broader above. Roots fibrous, numerous, slender, spreading themselves into the fissures of the bark of large trees. The above two species, common both in vallies, and on the tops of mountains.

GYNANDRIA DECANDRIA.

**Helicteres Isora.**—In great abundance along the skirts of the mountains from Hurdzvar to Coadwar, now in flower, very well known in most bazars under the name *Merowie*, from the resemblance its contorted capsules bear to a screw, an *Hindu* name for that instrument.
GYNANDRIA POLYANDRIA.

Grewia 1.—With leaves alternate, short petioled, three nerved, ovate, much pointed, serrated, harsh to the touch. Calyx, five-leaved: leaves lance-linear, nerved, spreading. The petals resemble the leaves of the calyx, but are smaller. Filaments numerous, germ roundish, obtusely four cornered, villous. Stigma headed, depressed, five lobed, or cleft. The flowers are of a greenish white, mostly in threes on one common peduncle; peduncles solitary, and opposed to the leaves. Grows to a small tree, numerous on the islands of the Ganges near Hurdwar.

Grewia 2.—Leaves alternate, petioled, three nerved, ovate, serrated, tomentose, more so beneath than above, white, and resembling the feel of velvet: petioles very short, downy: peduncles axillary, crowded, short, trichotomous, downy. The flowers are much smaller than in the preceding species, and of an orange yellow; the calyces covered with the same velvet-like nap, the germ thickly enveloped therein, and the younger branches also covered with it. This grows to a large tree in the mountains about Amsore. Fruit not seen.

Pothis.—With large hearted petioled leaves, entire, without nerves, smooth. Petioles long, carinated, sheathing the stem. Flowers not seen; the large cylindrical spadix now crowded with ripe seeds, of an irregular ovate shape, about the size of a common pea, covered with a soft aril of a deep red, numerous, and affixed to a common receptacle, the whole externally defended by a thick capsular covering, internally, marked with as many cells as seeds, externally, with numerous reticulated lines, and minutely dotted. On handling the broken pieces of this covering, many shining needle-like points penetrate the skin, and produce irritation. The stems slender, jointed, sending forth fibres, which spread on the bodies of those trees over which they climb. The natives call it Haat-phool,
MONOECIA TRIANDRIA.

_Huat-phool_, from the irritation excited on incautiously handling it. It seems to be _Adpendix-porcellanica_ of _Rumphius._

_Phyllanthus grandisfolia_.—Now in flower on the sides of the mountains near Bedeyl.

MONOECIA TETRANODRIA.

_Betula_.—Leaves alternate, petioled, ovate, obtuse, obscurely serrated. Peduncles axillary, aments fessile, conical, about the size of a small nutmeg, the dry aments the only part of the fructification seen. Grows to a pretty large tree, the bark is an article of trade into the plains of _Hindustan_, said to be used by the manufacturers of chintz to dye red, known by the name of _Attcess_. Saw several trees between _Dosah_ and _Belkate._

_Cica disticha_.—_Averrhoa acida_, L. _Syst. ed. XIII_, 357.—_Terme, Gærtn._ 2. 487. t. 180.—_Phyllanthus_, _Rox._—A forest tree in the valleys of these mountains, now in flower, grows to a considerable size.

_Morus_ 1.—Leaves alternate, petioled, oblong, ovate, widely and unequally serrated, acuminated, rough, three nerved, about four and a half inches long. Petiole one and a half inch, channelled. Peduncles axillary, solitary, short, hairy. Aments, cylindrical, short, dense, florets all female. Grows to a small tree in the jungles about _Dosah._

_Morus_ 2.—Leaves alternate, petioled, ovate, pointed, a little hearted at the base, from three to five lobed, unequally serrated, teeth obtuse, scabrous, about two and a half inches, and petiole three quarters of an inch. Peduncles fascicled axillary, aments diffuse, florets peduncled, all male. Grows to a small tree in the forests near _Coadwara._

_Morus_ 3.—Leaves alternate, petioled, ovate, somewhat hearted, acuminated, widely and unequally serrated, downy on both sides, and rough to the touch, six inches long; petiole one inch, channelled.
nelled. Peduncles axillary, solitary, short: aments cylindrical, dense, short, both male and female. The fruit when ripe about the size of the first joint of the middle finger, of a deep red, approaching to black; insipidly sweet, and mucilaginous. Grows to a tall tree with spreading head, found near the village of Nataana.

**MONOECIA POLYANDRIA.**

*Quercus.*—Leaves alternate, petioled, ovate-lance, serrated, teeth distant and rigid, smooth and shining above, hoary, with a dense down beneath, one nerved, from which are fourteen or fifteen pairs of parallel veins. The full grown acorns now on the trees, consequently flower in the coldest time of the year, and we may conclude from its situation here, it would bear the climate of Britain. The thickest forests are in the neighbourhood of *Adwana*; the trees rather low, but have the appearance of age, though none exceeded in circumference twelve feet, and fifty in height. The wood is of a reddish brown, very hard, and for this property refused by the natives for any purpose but firewood.

*Juglans.*—Three or four trees in the neighbourhood of Nataana, the fruit yet small, covered with a dense hair. Leaves pinnated with an odd one: leaflets sessile, lance-oblong, entire, smooth, the lower pair least, each pair increasing in size upwards. Growing on the sides of the mountains in a very stony soil.

*Carpinus* doubtful.—A low ill formed tree on the sides of the mountains, between *Dosa* and Belkate. Leaves without order about the ends of the branches, pinnated: leaflets about four pair, broad ovate, very obtuse, entire, beneath downy: common petiole columnar, downy, at its origin gibbous: proper, very short, cylindrical, downy. Flowers on long amentaceous spikes, crowded, but not imbricated, those bearing the female flower longest. Calyx of the male flowers is formed of six spreading
spreading unequal leaves, the middle one many times longer than the rest, one nerved, veiny. Corol none. Filaments from seven to eleven, scarcely evident, inserted within the leaves of the calyx. Anthers oblong, four cornered, thick, hairy, erect.—Female, Calyx one leaved, three parted, resembling a ternate leaf, with sessile leaflets, the divisions unequal, the middle one much the longest, oblong, rounded above, one nerved, veined. The only appearance of corol, are four oblong scales, seated on the germ, round the foot of the style, spreading, equal. Germ globular, a little pointed above, hairy. Style short, thick, cylindrical: stigmas two, about the length of the style, thick, slightly compressed, hairy. Pericarp, capsule, globular, two-celled, hairy. This has not been seen in its perfect state.

**MONOECIA MONADELPHIA.**

*Pinus taeda.*—Between Ghinouly and Sirinagur, several mountains are seen covered with this species of fir, the tallest appeared to be from sixty to seventy feet in length; one, which had fallen, measured sixty-five feet, and in circumference seven feet and a half. The natives prefer it to most other wood, for building, and many other uses, for the convenience with which they work on it, with their bad tools. It is also used for the purpose the trivial name implies, and is the only light they employ in their copper and lead mines. The means of transporting this useful timber from the situations it is found in, to the plains of Hindustan, appear too difficult and expensive, to offer any encouragement for such an attempt.

**DIOECIA DIANDRIA.**

*Salix.*—Leaves alternate, petioled, lanced, acuminate, unequally serrated, smooth, white beneath. Stipules lateral, semicordate, large, serrated, paired. It flowers in November, and in a considerable number.
ber of willows, all produced from the same source, none but male plants have been found, and the flowers hexandrous. They grow in plenty on the banks of the Ganges above and below Hurikaur, acquire the height of forty feet, in circumference seldom exceeding thirty inches. The wood is white, and very fragile.

**DIOECIA PENTANDRIA.**

*Xanthoxylon.*—A small thorny bushy tree, growing on the sides of the mountains, about Nataana, and other places. Leaves unequally pinnated; leaflets sessile, from three to six pairs, the lower pair smallest, increasing upwards, the terminal one being the largest, oblong-lance, obscurely and distantly serrated, dotted, smooth, largest about three inches long and one broad, between each pair of leaflets, a solitary straight rigid prickle. Petiole winged, along the middle prominent. Flowers inconspicuous; on short, axillary, compound, racemes (both on male and female plants). The short bunches of fruit ripen in May, the capsule about the size and shape of a small pepper-corn, these and every part of the plant, possess an aromatic and durable pungency. The natives scour their teeth with the young branches; and chew the capsules as a remedy for the tooth-ach. They believe that the capsule, with the seeds bruised, being thrown into water, renders it fit for drinking, by correcting any noxious quality which it may have. The branches cut into walking sticks, with their thorns rounded off, have a formidable appearance, and may properly be called *Herculean* clubs. It differs much from the figure in *Catesby's Carolina.*

*Cannabis Sativa.*—This plant is cultivated in several parts of the mountains, for two purposes: one for the manufacture of a coarse thick cloth, which the poorer people wear, and the other in making an intoxicating drug. Much used, mixed with tobacco, in smoking, by the people of many parts of
of Hindustan, and is an article of traffic, between the inhabitants of this range of mountains to the eastward, and the natives of the low countries.

DIOECIA DODECANDRIA.

In a shaded valley near Ghinouly, a tall, slender, straggling tree, now in flower, the fructification too complicated for abbreviated description, or comparison with other genera, therefore the full characters are here given. Branches alternate, straggling, few. Leaves alternate, towards the extremities of the branches, petioled, ovate, entire, smooth above, slightly downy beneath, about nine inches in length. Petioles very short, columnar. The flowers are axillary, produced in a kind of single umbell, three or more from the same axill. Common peduncles cylindrical, about half an inch in length, downy; partial, similar, a little shorter; proper, still shorter, about two lines in length.

Characters of the male flowers. Calyx universal involucre, five-parted (perhaps five-leaved): divisions rounded, concave, expanding; partial, of similar form, carrying six florets in its base; proper perianth six-parted, divisions lance-ovate, hairy, expanding, sometimes reflected. Corol none. Stamina, filaments mostly thirteen, filiform, unequal in length, hairy, inserted into the base of the calyx, the seven shortest or interior series, furnished towards the foot of each, with a pair of compressed kidney shaped glands, inserted singly by a minute thread into the sides of the filament; the six exterior or longest, simple. Anthers oblong, four-celled, two of which are lateral, and two near the apex in front, each furnished with a lid, which on the exclusion of the pollen are forced up and shew the cells distinct.

Female—Calyx, universal and partial involucre as in the male. Proper perianth, five or six cleft, less hairy.
hairy, more coloured than in the male, the laciniae of the border, small, ovate, thin, withering. Corolla none, unless the coloured perianth is so called. Nectaries, six pair of glands resembling those of the male flower, affixed in the same manner, to six short, hairy filaments, with the addition of a linear hairy scale, or filament at the back of each, but distinct, all inserted into the base of the calyx. Pistil, germ above, roundish, ovate. Style cylindrical, obscurely furrowed down the middle; stigma two-parted, spreading. Pericarp, a berry, at present about the size of an orange seed, ovate, one-celled, one-seeded.

N. B. Sometimes the glands in the male flowers are one less, the same number of filaments, however, remain (13). The partial involucre is sometimes found with five florets only in its base, the number of its divisions in that case was one less, viz. four. The flowers of the male plant are larger and more numerous. The natives distinguished the male and female trees by different names, the former they called Kutmoreeaa, and the latter Pup-reea. It is found also in the forests near Coadwara, below the ghat.

POLYGAMIA MONOECIA.

Terminalia Alata-glabra.—Grows to a very lofty tree in the vallies of these mountains. Stem straight, and clear from branches to a great height. The characters given to the genus Chirncoa, in Gmelin's edition of the Systema Naturae, agree well with this plant.

Mimosa Catechu 1.—In great abundance in the forests of these mountains, and islands of the Ganges near Hurdwar, now destitute of foliage, a shabby thorny tree, the dry legumes hanging in great abundance; flowers during the rainy season.

Mimosa 2.—A large tree bearing great resemblance to Mimosa lebbeck, now in flower in the forest near Coadwara. Leaves twice pinnated, abruptly, from
Polycarpus

from ten to twelve paired; leaflets sessile, from thirty-two to thirty-four pair, halved longitudinally, oblong, about three-eighths of an inch long by one-eighth, downy. Petioles and peduncles downy, one globular gland on each common petiole, an inch below the leaves, and another similar, but smaller, between the terminating pair of leaflets. Stipules lateral, paired, ovate, acuminate, one nerved, veiny, downy, large. Those on the peduncles resemble them, and are perhaps bracts. The flowers resemble those of M. lebbeck. It comes nearest to M. arborea.

Polygamy trioeia.

Ficus-laminosa.—An humble species, growing among detached rocks in a small water course, and other moist places along the valley of the Koa-nullah. The stem is procumbent, shrubby, diffuse. Leaves opposite, lanceolate, entire; fruit laminous. The natives collect the leaves to feed their cattle with, and call it Chancherree.

Ficus 2.—A slender bushy kind, in dry elevated situations, near Dosa. Leaves alternate, on short hairy petioles, ovate, pointed, entire, thickish, with prominent reticulated veins. Peduncles axillary, solitary, cylindrical, short, hairy; fruit globular, about the size of a marrow-fat pea, downy; Calyx beneath, three parted, downy; it bears some resemblance to F. pumila.

Ficus 3.—Growing in the same situation with the above, a stronger bush. Leaves alternate, few, distant, oblong; sometimes much rounded above, but acuminate entire, rough, three nerved, with distant veins running into each other along the margin of the leaf: petioles very short, hairy. Fruit axillary, solitary, sessile, rough, globular, about the size of a small gooseberry. Comes nearest to F. Microcarpa.

Ficus 4.—A large tree in the forests along the Koa-nullah, though on elevated situations. Leaves ovate, obtuse, entire, large, downy. Peduncles variably
Fruition variably produced from the stem and branches, crowded, cylindrical, short, downy. Fruit globular, as large as a small pullet's egg; when ripe, eatable, of a yellowish green, mixed with red, not very desirable to the taste of an European, but by the natives esteemed a good fruit. Called by them Timla.

CRYPTOGAMIA FILICES.

Asplenium.—Growing on the bodies of trees covered with moss. Frond simple, lance-linear, narrow, attenuated at both ends, smooth, entire: the fructification in distinct distant, round, parcels along the margin, and over which, when mature, the sides of the frond are reflected, the whole contorting and resembling a worm.

Polypodium.—Growing in similar situations with the above. Frond simple, lance-linear, acuminate, entire, woolly. The fructification covering the whole of the disk, except at the two extremities; the opposite side smooth and pitted. Roots, fibrous, numerous, capillary.

Adiantum Serrulatum.—Frond composite, leaves longitudinally striated. Found on the sides of every hill.

Marattia alata and laevis.—These two beautiful ferns are mostly found together, in moist and shaded situations, particularly on the more elevated part of the mountains about Ackwaanee and Natuana.

Among many plants observed, whose place in the system, for want of particular parts of the fructification, could not be ascertained, the following may deserve noticing here.

Kâ-i-y-p, country name, Gladwin's Mat. Med. —This is a middle sized tree, indigenous to these mountains, the bark of which is much valued in Hindustan for its aromatic and medicinal properties, and sold in every bazar under this name. The fruit
fruit is a drupe, about the size of a small nutmeg, of a round oval, the nut bony, furrowed, one celled, one seeded, covered with a thin pulp, with a carbu-n-cled surface, red when ripe, and very agreeable to the taste, highly esteemed by the natives. The branches are opposite, cylindrical, much marked with the vestiges of fallen leaves. Leaves irregularly opposite, rather crowded about the extremities of the branches, petioled, ovate, pointed, sometimes elliptical, entire, smooth: petioles short, channelled. Flowers, according to information from the natives, in the month of March. It would probably bear the climate of Britain.

No name.—In the neighbourhood of Hurdwar, a large spreading tree, without foliage, or flowers, the full pericarps hanging in many clusters, consisting of five inflated large kidney-shape capsules, united at one end to the apex of a short woody peduncle, pointed at the other, the points inclined inwards, each capsule in size, &c. resembling the follicle of Asclepias-gigantea, downy, one-celled, with a dorsal suture the whole length. Seeds from six to eight, ovate, about the size of a citron seed, black, covered with a white mealy substance, attached by one end to the edges of the suture. Some appearances warrant the conclusion it is a species of Sterculia. From the body of the tree exudes a white pellucid gum, discovering similar properties to the gum taken from Sterculia-platani-folia, and which, so much resembles gum tragacanth, that it has been collected and sold, on the supposition of being such. Whether it will stand the test and be received as such in Europe, time will show. The plant producing that genuine gum, is not found on this side of India, to the best of my information.
TO SIR JOHN SHORE, BART.

PRESIDENT OF THE ASIATIC SOCIETY.

Dear Sir,

With this, I take the liberty of sending you an account of the excavations near the town of Ellora, differing somewhat from the paper formerly submitted to you, but still requiring all the indulgence then claimed, for the disadvantages under which it was written. Some drawings and a plan accompany it, that will, I hope, prove illustrative of the description. For the plan and the measurements, I am indebted to Lieutenant James Manley, and have entire reliance on their accuracy.

The drawings were taken by a very ingenious native in my service, named Gungaram, whom I sent to Ellora for that purpose, previous to going thither myself, when he was unfortunately too much indisposed to attend me; so that the opportunity of correcting what was done, substituting more eligible points of view, or adding to my collection, was lost; and I am reduced to the alternative of sending them, with all their numerous errors and imperfections, or sacrificing, to my conviction of those imperfections, the desire of conveying to you, agreeably to promise, some idea, however inadequate, of works, concerning which it has been, and still is, rather my wish to excite, than my hope to gratify, curiosity. That arduous task, I shall leave to the fine taste, masterly pencil, and laudable industry, of Mr. Wales, an artist, mentioned in a former letter, who has already made great progress in such a collection of these wonderful antiquities, many of them hitherto unheard of by Europeans, and first discovered by his enquiries, as with the addition of those of Ellora, which he means to visit,
visit, will at once engage and satisfy the expectations of the learned and the curious.

Under these circumstances, I no longer hesitate to submit the drawings, with all their errors and inaccuracies, to your notice and disposal, thinking it necessary, at the same time, to acquaint you, that as my draftsman will attend Mr. Wales in his intended journey to Ellora, he will be enabled, by the liberal instructions of that gentleman, to correct his errors of delineation and perspective; and as it is reasonable to suppose that most of Mr. Wales's own views will be from different points, I hope this prospect of being furnished with a new set of those now sent will regulate you as to any present public use of them, unless for the purpose above mentioned, of awakening curiosity to the produce of Mr. Wales's skill and industry.

My enquiries, as to the origin or date of these wonderful works, have not hitherto been satisfactory. Doubtless, however, it is, that they are the works of people, whose religion and, mythology were purely Hindu, and most of the excavations carry strong marks of dedication to Mahdew, as the presiding deity. The fanciful analogies of some travellers (particularly that attributed to the eight handed figure of Veer Buddur, holding up raja Dutz in one hand, and a drawn sword in another, with the famous judgment of Solomon) now vanish; and we seek no longer for colonies of Jexes, Egyptians, Ethiopians, or Phenecians, to supercede the more rational mode of accounting for such works in the enthusiastic labour and ingenuity of the natives of the country; by which means, the wonder is at least simplified, no trifling point to minds in quest of, and in love with truth.

The difference of the inscriptions, in some of the caves, from the present known characters of Hindustan, may
may be objected to their being the produce of *Hindu* artists; but it is well known, that the formation of letters undergoes great changes in the course of ages, and that such may be the case, with respect to the excavations on this side of *India*, may be fairly inferred, from the difficulty with which the ingenious Mr. *Charles Wilkins* traced and recovered, as I have been informed, some inscriptions in the neighbourhood of *Ghya*. But I am inclined to think, that we are not sufficiently acquainted with the characters of the south of *India*, such as the *Tumbole, Arvee, Kinaraa*, and *Telinghee*, to pronounce on their affinity to those in the excavations, which will be fully submitted to the scrutiny of the learned in Mr. *Wales's* intended work.

Though I have above mentioned my persuasion, that the generality of the excavations I have seen, not only at *Ellora*, but elsewhere, are dedicated to *Maideew*; yet I do not mean thereby to abandon an idea, that the most northern caves of *Ellora*, occupied by the naked sitting and standing figures, are the works of the *Sevas* or *Jattees*, who, by the *Brahmens*, are esteemed schismatics, and whose sect, called *Srawuk*, is very numerous in *Gusarath*. The tenets, observances, and habit, of the *Sevas* are peculiar, and in many points very different from other *Hindus*. Their adoration of the deity is conveyed through the mediation of *Adnaaut* and *Parisnaaut*, the visible objects of their worship, personified as a naked man sitting or standing. This sect is supposed to be of a comparatively modern origin, if so, and the foregoing hypothesis of the dedication of the temples to their idol, be admitted, the limit of their possible antiquity follows, but without ascertaining, or affecting, that of the others.

On this very interesting point, I mean the antiquity of these astonishing works, I shall here trouble you with the different accounts of two intelligent men,
men, one a Mahomedan the other a Hindu. The first, named Meer Ala Khan, an inhabitant of Ahmednagar, who said that he had heard it from a person of acknowledged erudition, but whose name I forgot. The second, a Brahmen, inhabitant of Roza, who quoted a book entitled Svera Lye Mahat, or the grandeur of the mansion of Svera, i.e. Mahdew, as his authority; for the authenticity of which I have hitherto sought in vain.

The Mahomedan says, "the town of Ellora was built by rajah Eel, who also excavated the temples, and being pleased with them, formed the "fortress of Deoghire (Doulutabad), which is a "curious compound of excavation, scarping, and "building, by which the mountains were converted "into a fort, resembling, as some say, the insulated "temple in the area of the Indur Subba. Eel rajah "was contemporary with Shah Momin Arif, who "lived 900 years ago."

The Brahmen on the other hand, says, "That the "excavations of Ellora are 7894 years old, formed "by Eeloo rajah, the son of Peshpont of Elichpore, when 3000 years of the Dvarpa Yoag were "unaccomplished, which added to 4894 of the pre- "sent Kal Yoag, makes 7894. Eeloo rajah's body "was afflicted with maggots, and in quest of cure, "he came to the famous purifying water named Svera "Lye, or, as it is commonly called Sewalla, that had "been curtailed by Vishnu (at the instigation of "Yemdurhum, or Jum, the destroying agent) from "sixty bows length (each four cuvits square), to the "size of a cow's hoof. In this water, Eeloo dipped "a cloth, and cleansed with it his face and hands, "which cleared him of the maggots. He then built "Koond (or cistern) and bathing therein, his whole "body was purified; so that, looking on the place "as holy, he first constructed the temple called "Keylmus, &c. to the place of Biskurma."
This wide difference in the era between the Hindu and the Mahommedan, must remain, I fear, inexplicable; while our attention is necessarily attracted to their agreeing in the person of Eel Eea, or Eeloo rajah, as the author of the excavations, whose being identified as living in the same age with a well known character, seems to throw the weight of probability into the Mahommedan's scale; and it must be remarked, that however fond the writers of that faith may be of the marvellous, in points of preternatural agency, according to their own system; yet, as annalists, they seem more entitled to credit than the Hindus, whose historical and theological chronology, is greatly mixed with, and obscured by, fable.

The Koond, or cistern, mentioned by the Brahmens, is extant, and in perfect preservation, just without the town of Ellora, and the holiness of its water is still in such high estimation as to render it a Teerut (pilgrimage) of great reputation and resort, under the appellation of Sewalla Teeruit, or Koond. The neighbouring temples probably form a part of the attraction, as they are much frequented by devout Hindus.

It is necessary to observe, that there are a great many other excavations in the semicircular mountain that commands a view of the fine valley of Ellora, which, indisposition prevented my visiting.

Whether we consider the design, or contemplate the execution, of these extraordinary works, we are lost in wonder at the idea of forming a vast mountain into almost eternal mansions. The mythological symbols and figures throughout the whole, leave no room to doubt their owing their existence to religious zeal, the most powerful and most universal agitator of the human mind.
Of the ancient Brahmens, avoided the contamination of cities, and affected the purity and simplicity of rural retirement; when far removed from observation, the imagination of their disciples probably enhanced the merits of their sanctity. To alleviate austerities, and to gratify the devout propensities of these holy men, naturally became objects of pious emulation. Under this influence, the munificence of princes may have been engaged to provide them retreats, which sanctified by the symbols of their adoration, were at once suited, in simplicity and seclusion, to those, for whom they were intended, and in grandeur to the magnificence of their founders. Thus power and wealth may have been combined, under the guidance of enthusiasm, to produce monuments, scarce less extraordinary or less permanent, though less conspicuous and less known, than the pyramids.

But though the high antiquity of the generality of these excavations is incontrovertible, being lost in fable, and vulgarly ascribed to the preternatural power of the five Pandoo brothers; yet are there exceptions, of which I saw an instance in a hill near a garden in the neighbourhood of Aurungabad, where there are two excavations, but of inconsiderable dimensions, formed, as I was credibly assured, by raja Paur Sing, one of the Rajpoot Ameers of Auringzebe's court, as a place of retirement, during his attendance on that monarch in his excursions to the neighbouring garden.

Begging your excuse for this trouble,
I remain, dear Sir,
Your most obedient humble servant,
C. W. MALET.

Poonah, 22d December, 1794.
View of the Cave of Jagnath Subba near Ellora.
DESCRIPTION of the Caves or Excavations, on the mountain, about a mile to the eastward of the town of Ellore, or, as called on the spot, Verrool, though therein there appears inaccuracy, as the foundation of the town is attributed to Yelloo, or Elloo rajah, whose capital is said to have been Ellichpore.

I SHALL begin this description from the northernmost caves, and continue it in the order as they are situated in the mountain, which runs in a small degree of circular direction from N. 25 W. to S. 25 E.

JUGNATH SUBBA, Plate A. Front S. 15 E.

This is a fine excavation that fronts the entrance of the area, having, on the left side Adnaut Subba, and on the right some other small excavations almost choked up, as is also the lower story, scarce so much of it appearing as is represented in the plate. The ascent to the upper story is by a flight of steps, in the right corner of this excavation, the inside of which is in very fine preservation, many parts of the ceiling, pillars, &c. having the coat of lime, with which the marks of the chisel have been concealed, and which has been curiously painted, still adhering to the stone. An idea of the front of this fine cave is tolerably conveyed in the etching. Opposite to the front of the cave is a large figure sitting cross-legged, with his hands in his lap, one over the other, which the Brahmen who attended me called Jugnath; his two attendants, he called Jay and Bidjee*. On each

* In the Hindu mythology, Jay and Bidjee, or Widge, are the porters or door-keepers of Vishnu.
side of the entrance of the recess are two standing figures, whom he called Sud and Bud. The whole room, except the open front, has the same figures as that in the recess; but of a smaller size. They all appear to be naked, and to have no other covering on the head than curled hair. The Brahmen who shews the caves has a legend that they were fabricated by Biskurma*, the carpenter of Ramghunder who caused a night of six months, in which he was to connect these excavations with the extraordinary hill and fort of Doulotabad, or Deoghire, about four coss distant; but that the cock crowing, his work was left unfinished, and the divine artist took the Outar of Bode. In the left hand side of this fine cave, there is a coarse niche that opens into the Adnaut Subha below. This cave consists of two oblong squares, the inner one being formed by twelve pillars, the four at each end differing from those in the centre.

Dimensions of Jugnath Subha.

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of the cut through the rock at the entrance</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Height of the principal figure, sitting</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Whole length of the cave</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>Length of the inner square from the base of the pillars</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Breadth of the whole cave</td>
<td>47</td>
<td>7</td>
</tr>
<tr>
<td>Ditto of the inner ditto</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Ditto to the plain work of the recess</td>
<td>56</td>
<td>7</td>
</tr>
<tr>
<td>Circumference of the shaft of one of the four middle pillars</td>
<td>9</td>
<td>7½</td>
</tr>
<tr>
<td>One side of the base of ditto</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>From the base to the capital</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>From ditto to the stone beam</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>From the floor to the ceiling</td>
<td>13</td>
<td>4½</td>
</tr>
</tbody>
</table>

*Viswa, or Wisma Kurma, creator or maker of the world.
The ceiling has been very handsomely painted in circles, many parts of which, and the border, consisting of figures, are entire, both of men and women, the former of which are generally bare-headed, with short drawers or Cholnas, the women with only the lower parts covered. There is no inscription in the cave. There are groups of dancers and singers, with the same instruments as are now in use. Some of the painted figures have highly ornamented head dresses, like Tiaras; but it seems an argument against the antiquity of the painting, that much of the fine sculpture and fluting of the pillars are covered by it, which, it may be supposed, would not have been done by the original artist.

ADNAUT SUBBA.

Is on the left hand entrance of the Jugnath Subba, as represented in the Plate A. The entrance of this excavation is unfinished, and above the entrance has the figures of Luchmee Narrain with two attendants, much injured by time and weather. At the extremity of the cave, opposite the entrance, is seated the idol Adnaut; and from the left, there is an opening into another cave, of smaller dimensions, but infinitely better work; that is now so much choked with earth, as to have left scarce more than the capitals of the pillars above the ground. These capitals are very handsomely finished in the style of the front ones of Jugnath Subba.

Dimensions of the cave of Adnaut.

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height of the figure, sitting</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>From the entrance to the figure in a recess</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>From the entrance to the plane of the opposite wall</td>
<td>34</td>
<td>6</td>
</tr>
<tr>
<td>From side to side</td>
<td>28</td>
<td>6</td>
</tr>
<tr>
<td>Height of the ceiling</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Square of a pillar being plain (figures in the sides of some)</td>
<td>2</td>
<td>11</td>
</tr>
</tbody>
</table>

Height
INDUR SUBBA.  Front South.  B.

You enter this magnificent cave, or assemblage of caves, by a handsome gateway cut from the rock, on which are too lions couchant. There is a small cave much choked, before the gateway on the right hand. From the doorway, you enter an area, in which stands a pagoda, or temple (C) of a pyramidal form, in which is placed a kind of square altar, with figures on each side, of the same kind as in the last Subba. This temple is elaborately finished with sculpture, and a mass of sculptured rock serves as the gate, left and fashioned, when the avenue to the inner apartments was cut through the stony mountain.

In the same area, on the left hand side, is a very handsome obelisk, (C) the capital of which is beautified with a group of sitting human figures that are loosened from the mass. The obelisk is fluted and ornamented with great taste, and has a very light appearance.

On the right hand side of the area, is an elephant but without rider or Hoda.

On the left hand side of the same area, is an excavation, with a figure, like the preceding ones, in the recess opposite the entrance. In this there are also the remains of painting on the ceiling, &c. with abundance of sculptured figures on the sides within, and without of elephants, lions, &c. On the right hand side, the excavations are imperfect above and below.
INDUR SUBBA.

The Temple.

Published by I.Sewell &c, Feb. 14th 1807.
INDUR.
INDRANEES.

Published by J. Sewell So. Feb. 11, 1801.
After passing the same temple in the area, you come to the entrance of the lower story of this Subba, which is in a very unfinished state, but has a figure in the recess opposite the entrance like the former.

From this lower story, you ascend to the upper by a flight of steps, on the right hand side, fronting the top of which, is a gigantic figure of Indur, (Plate D. No. 1.) with a tiara on his head, a janoee or Brahmen string, over his left shoulder, sitting on an elephant couched. Opposite to him is Indranee (No. 2) his consort, seated under a mango tree, on a lion. At the end of this cave is a recess with the same figure as in the former, who seems to be the presiding idol in the caves yet seen. This room is formed into two nearly square divisions by twelve pillars. In the middle of the inner square is an altar.

There is a redundancy of figures in this fine cave, so as to preclude particular description, and leaves me at a loss whether most to admire the minuteness of the parts or the beauty of the whole. The latter will be better understood from the measurement. The etchings will give a faint idea of the former.

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base of the obelisk (N. B. it is much decayed)</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Height of the excavation of the area</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Depth of area</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>Breadth of ditto</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Gateway high</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Ditto broad</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Temple, square</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Ditto height</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Obelisk</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Ditto with the figures at the top</td>
<td>24½</td>
<td></td>
</tr>
</tbody>
</table>

Circumference
<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circumference of the obelisk</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Elephant, long</td>
<td>-</td>
<td>13</td>
</tr>
<tr>
<td>Ditto, high at the shoulder</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>Left hand cave in the area, deep with niche</td>
<td>-</td>
<td>32</td>
</tr>
<tr>
<td>Ditto ditto ohne niche</td>
<td>-</td>
<td>26</td>
</tr>
<tr>
<td>Ditto breadth</td>
<td>-</td>
<td>27</td>
</tr>
<tr>
<td>Ditto height</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>Another small cave on the same side, deep</td>
<td>-</td>
<td>15</td>
</tr>
<tr>
<td>Ditto ditto broad</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Ditto ditto high</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Lower story, deep, from the entrance to the door of the recess</td>
<td>-</td>
<td>79</td>
</tr>
<tr>
<td>Ditto breadth</td>
<td>-</td>
<td>38</td>
</tr>
<tr>
<td>Ditto height of ceiling</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td>Ditto square of pillars, being plain</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Upper story, deep, from the figure in the recess to the opposite veranda</td>
<td>-</td>
<td>78</td>
</tr>
<tr>
<td>Ditto from the plane of the two walls</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Ditto breadth</td>
<td>-</td>
<td>66</td>
</tr>
<tr>
<td>Ditto height of the ceiling</td>
<td>-</td>
<td>14</td>
</tr>
<tr>
<td>Ditto principal figure in the recess, sitting</td>
<td>-</td>
<td>5 1</td>
</tr>
</tbody>
</table>

**Pursaram Subba.**

On the left hand side of the upper story of the Indur Subba, there is a passage into this Subba, which though smaller than any of the foregoing, is exactly alike, and equal to them in the fabrick and preservation of its work. There is a passage from it into the upper story of Jugnath Subba, already described, which will explain the contiguity of these three caves.
Mountains to the Eastward of Ellora. 395

Dimensions of Pursaram Subba.

<table>
<thead>
<tr>
<th></th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth from the front to the figure in the recess,</td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>Ditto from the plane of each wall,</td>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>Breadth,</td>
<td></td>
<td>25 6</td>
</tr>
<tr>
<td>Height of figure in the recess, sitting,</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Ditto of ceiling,</td>
<td></td>
<td>8 10</td>
</tr>
<tr>
<td>Square of pillars at the base,</td>
<td></td>
<td>2 3</td>
</tr>
</tbody>
</table>

Doomar Leyna, W. 15 S. distance from the last about 4 mile.

The entrance to this stupendous excavation is through a cut, or lane, in the solid rocky mountain. On the left hand side of this lane, is a cave that is near choked up with earth. The lane terminates from without at a doorway, through which you enter an area, at the end of which, opposite the door, is a small cave. On the right hand of the area is the great excavation, having at its entrance, two lions couchant, one of which has lost its head. You enter this cave by a kind of veranda, on the left hand side of which is a gigantic sitting figure of Durma rajah, with a club in his hand, and a jinoee over his shoulder. On the right hand Wisweyshwur Mah dew, in a dancing attitude, with a group of figures round him, among which is the bull Nunlee.

After passing this veranda, the cave widens very considerably, and still more after passing the next section of pillars, till you come to the centre or fourth section, on the left of which is the centre door of a very fine square temple, on the right entrance of which is a fine standing figure of Mun, a tiara on his head, a jinoee on his shoulder, and Bouannee standing by him, with two small figures above. On the left hand is exactly the same group, said to be Pouan and Luchme. On the side facing the alley, are similar groups, said to be Chund and his wife Suckabyhe on the right, and Prechund and
and his son Govinda on the left. The same groups appear on the back part of the temple which has four doors) near the wall, under the names of Sunk and Mahsunk; and on the remaining side, under the names of Sid and Rid; but I place not much faith in these accounts of the Brahmen who explained them to me. After passing the four sections of pillars, one end of which is occupied by this temple, the remaining two decrease in the same order as at the entrance by the alley. It should not be forgotten that the temple above described is completely occupied by the altar and Ling of Mahdew. Opposite to this temple, and to the right as you enter by the alley, there is a fine open entrance, leading directly up to a square temple. On the right hand side of this grand entry, is a group (Plate E.) of Mahdew and Purwuttee, supported with their heavenly suite, by Kouon. On the left side is Veer Budder with eight hands. In one is suspended the slain rajah Dutz. The other wields a sword, striking the elephant Evawuttee on the head. Two support a canopy. One has transfixed Dytaerer with a spear. One holds a snake. One a vessel to receive the blood of the slain Dytaeer; and one is broken, but which originally held the bottom of the spear, with which Dytaeer is transfixed. Lucume is sitting beneath him.

The end opposite the entrance by the alley, and which exactly resembles it, has a small area descending a great depth by steps to a pool of water, supplied by a cascade that falls during the rainy season from the whole height of the mountain. Over the staircase is a small gallery, meant seemingly to sit and observe the falling stream.

On the right hand side, as you enter from this avenue, there is a group of a standing woman and seven smaller figures. The left hand has nothing. On entering the first section of pillars, there is, on the right hand,
MAHDEW and PURWUTTEE

VEER BUDDER

Published by I. Sewell & Co. Feb. 1, 1861.
MOUNTAINS TO THE EASTWARD OF ELLORA. 397

hand, a representation of the nuptials of Gowra Maheedew) and Parwuttee, with a great number of figures above, Rajah Dutz and Alia, Parwuttee's father and mother on one side, and Brimha, in a sitting posture, performing the marriage ceremony, with Vishnu standing behind him. In front of this group are the circles cut in the floor for performing the Ludcha Home, or nuptial sacrifices. On the left hand side is another group of Maheedew and Parwuttee, with the bull Nundee.

There are, as in the other, the remains of painting in this cave, but principally on the ceiling. The heads of the figures in this cave are generally adorned with highly decorated tiaras. The thighs of some of the men have cholnas, but I cannot discriminate any other parts of their drapery.

Dimensions of Doomar Leyna.

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cut, or alley, through the rock from</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the beginning to the door of the cave</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>The breadth of ditto</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Height of the rock through which the cut</td>
<td></td>
<td>31</td>
</tr>
<tr>
<td>is made at the entrance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ditto ditto in the area</td>
<td></td>
<td>61 6</td>
</tr>
<tr>
<td>Cave on the left hand side of the alley,</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td>nearly choked, in length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth of the said cave</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>Height remaining unchoked</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Door at the entrance of the area, height</td>
<td></td>
<td>11 6</td>
</tr>
<tr>
<td>Ditto, breadth</td>
<td>4 4</td>
<td></td>
</tr>
<tr>
<td>Area length</td>
<td>51 4</td>
<td></td>
</tr>
<tr>
<td>Ditto, breadth</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Cave, opposite the door</td>
<td></td>
<td>28 6</td>
</tr>
<tr>
<td>Ditto, breadth</td>
<td>17 3</td>
<td></td>
</tr>
<tr>
<td>Height partly filled up, remaining</td>
<td></td>
<td>10 6</td>
</tr>
<tr>
<td>Square of the pillars</td>
<td>2 4\frac{1}{2}</td>
<td></td>
</tr>
</tbody>
</table>

Footnotes:

Fett.    Lycbs.

- Dimensions of Do"mar Leyna,

- The cut, or alley, through the rock from the beginning to the door of the cave, 100 Feet. 10 Inches.

- The breadth of ditto, 8 Feet.

- Height of the rock through which the cut is made at the entrance, 31 Feet.

- Ditto ditto in the area, 61 Feet 6 Inches.

- Cave on the left hand side of the alley, nearly choked, in length, 66 Feet.

- Depth of the said cave, 26 Feet.

- Height remaining unchoked, 6 Feet.

- Door at the entrance of the area, height, 11 Feet 6 Inches.

- Ditto, breadth, 4 Feet 4 Inches.

- Area length, 51 Feet 4 Inches.

- Ditto, breadth, 26 Feet.

- Cave, opposite the door length, 28 Feet 6 Inches.

- Ditto, breadth, 17 Feet 3 Inches.

- Height partly filled up, remaining, 10 Feet 6 Inches.

- Square of the pillars, 2 Feet 4\frac{1}{2} Inches. 12
Breadth of the first section of pillars on entering the great cave, from wall to wall, 51 6
Ditto of the second ditto, 90 3
Ditto of the third, fourth, and fifth ditto, 135 1½
The two remaining the same as the two first.
The depth from the ingress at the alley to the egress at the tank, 135 10
The square of the temple occupying the left hand side as you enter from the alley, 30 7
Height from the floor to the ceiling, 16 10
Square of the pillars at the base, generally, 4 3
Height from the highest figures, being those on the four sides of the temple, 13 6
Breadth of the southern area cut through the rock, 18 6
Length ditto ditto 55

Number of pillars 44, the space occupied by the temple interrupting the ranges. It is well worthy notice, that one of the beams of stone, that, crossing this cave, rests on the heads of the pillars, is much thicker than the rest; which, it may be supposed, arose from the workmen perceiving some flaw in such an immense space of ceiling supporting such a mass of mountain above.

There are thirty steps on the southern entrance, but as they do not reach a third of the way to the water, it may reasonably be supposed that the stupendous fall from the top of the mountain to the present bottom, 120 feet, must have greatly deepened the reservoir since its first construction. This fall forms a nullah that runs by the village of Ellora.

Length of the gallery over the southern stair case, 29
Breadth ditto ditto 14
Height, ditto ditto 7 6

JUNWASSA,
JUNWASSA, or the place of Nuptials——
Aspect W. N. W.

This excavation is just across the chasm that lies between it and Doonmar Leyna. It is much inferior to the preceding. It has a veranda with windows, by which the inner cave is enlightened, in which there are figures of Mahde, Vishnoo, and Brimha, on the left of the door; Bhuleel, Luchme, and Narrain, on the right; and on the left hand extremity, of the Bharra Outar, in which the boar is represented as bearing Pritwa or the world, on his tooth, and having Seyes under his foot. On the right hand end side is a sleeping figure of Koom Kurn, with a woman chafing his belly. You enter the cave from the veranda by a door. In the cave there are no figures of any note, though there are niches. It remains, therefore, only to give the dimensions of this cave, and proceed to others more worthy notice.

Dimensions.

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of veranda,</td>
<td></td>
<td>64</td>
</tr>
<tr>
<td>Breadth ditto,</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Height ditto,</td>
<td></td>
<td>12 2</td>
</tr>
<tr>
<td>Breadth of the door way entering the cave from the veranda by four steps,</td>
<td></td>
<td>5 5</td>
</tr>
<tr>
<td>Height ditto,</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Length of the wall, after entering the door, without including two recesses at each end,</td>
<td></td>
<td>66 11</td>
</tr>
<tr>
<td>The two recesses at each end, square,</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>The two recesses, height,</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Breadth of the hall,</td>
<td></td>
<td>19 6</td>
</tr>
<tr>
<td>Height ditto,</td>
<td></td>
<td>11 2</td>
</tr>
<tr>
<td>Another recess on the right hand within the hall, square,</td>
<td></td>
<td>7 0</td>
</tr>
</tbody>
</table>

The
The recess containing the temple, depth,
22 5 by 11 11

Ditto, height, 8 2

A few yards further to the right is another part of the Junwassa, with nearly the same aspect, N. 80 W. as the last, with an open front of four pillars, three feet six inches square at the base, and thirteen feet high, and two pilasters. After crossing the room or hall on entering, a recess is formed by contracting the length of the hall. On each side in this recess are female figures. The front of the recess is formed by two pillars and two pilasters, the singular style of which, appears in the annexed Plate F. In the recess is a square temple, having in it a raised altar with the Ling of Mahdeew. On each side of the door of this temple, are two gigantic male figures, with each a smaller female. The Brahmen that attended me, called the male figures Chund and PriChund. There is a passage round the temple in the recess.

Dimensions of this excavation.

Length of the hall, including a recess at each end of 15 feet each, 111

Breadth of the hall, or first section, 22 4

Height ditto ditto 15

The recess in which the temple stands, deep, 40

Ditto, breadth, 37 8

Temple, square, 21

Door of the temple, breadth, 4 4

Ditto, height, 8 11

COMAR WARRA, Aspect W. N. W.

This cave is near the last. Its entrance deformed by fallen rock, and accumulated earth. It is composed of four sections, divided by four pillars, though the outer one is unsupported by any at present, whatever it may have been formerly, and it is from the immense overhanging mass of unsupported rock,
The Door of the Temple of

JUNWASSOE.

Published by J. Sewell &c. Feb. 1, 1801.
rock, that the fragments have fallen; which deform and obstruct the entry. The four sections decrease gradually in length, the last being a recess, on each side of the door of which there are handsome gigantic figures, the right hand one having a straight sword in his hand; the other is mutilated; but there is no figure within the recess, though there is a pedestal that seems intended to receive one.

Dimensions.

Depth from the first pillars to the back of the recess 31
Length, laterally 57

GHANA, or the Oil-shop.

This is a small group of little rooms a few yards from the last, and probably takes its name from a place like that used by oil-men for expressing oil. It merits little notice, otherwise than as exhibiting a figure of the idol Gunnes, and the Ling of Mahdew. Very near it is another group of small rooms of nearly the same style with two Lings of Mahdew.

NEELKUNT MAHDEW, Aspect W.S.W.

This excavation is a few yards from the last. At its entrance is the bull Nundee, in a square enclosure, on which time has made its ravages. After passing this figure of Nundee, you ascend into the cave by a few steps, on each side of which on the wall at the extremity are two figures that seem to be of a military order. Opposite the door is a recess with the Ling of Mahdew made of very fine smooth stone. This excavation, like many of the preceding ones, is composed of sections formed by rows of pillars decreasing in lateral length to the recess. In the right hand wall of the section, before you reach the recess, is the figure of Swammy Kartick; and on the opposite side Gunnes, mutilated of his trunk.
trunk. Near Gunnes is a smaller figure of Sur-
suttee, and in the front wall, on each side of the
door of the recess, are figures of Luchmeel in diffe-
rent attitudes.

Dimensions.

Depth of the cave from the front to the bottom of the outer recess, containing the temple. Mahdew, 44 4
Length of the cave at its greatest length in the first section of pillars, 68 8
Height of the ceiling, 12
Recess, 28 6 by 17
There are fifteen pillars and pilasters in this cave.

RAMISHWUR, Aspect W. S. W.

This excavation is but a few yards from the last. The bull Nundee is couchant at its entrance, and on the left of it is a cistern of very fine water, to which you descend by steps. Previous to entering the cave, on each side, at the extremities, are female figures. The front of this cave is supported by four pillars and two pilasters of considerable beauty and elaborately sculptured. A female figure on the left hand pilaster has much grace. It is worthy notice, that the figures in the latter caves have universally highly ornamented head dresses, different from the first, which have only curled hair. Opposite the centre of the entrance is a large recess, containing a temple, in which the Ling of Mahdew is placed. This cave consists of a large hall, and the recess in which the temple is situated. At each end of the hall are recesses, containing a profusion of figures. The Nou Chunda occupy the extreme wall of that to the right. On the right hand of this recess is a curious group of skeleton figures, said to represent a miser, his wife, son, and daughter, all praying in vain for food, while two thieves are carrying off his wealth. Opposite to this
this group is another of Kal Behroo, the principal figure being in a dancing attitude, and musicians in the group.

Re-entering the hall again from the recess, on the right is a group of Mahdew and Parwuttee, playing at Chousur, with Narrund sitting between them, stimulating a feud, to which Parwuttee by the throw of her right hand, seems well disposed; which is below represented as having taken place, while a burlesque figure on the right is turning up his backside at them.

On the right hand side of the left recess, at the end of the hall, is the group of Bouanee Mysaseer; on the left hand, that of Swammy Kartick with his peacock and two mendaseers.

On the extreme wall, in the centre of this recess, is represented the nuptials of Jennuck Rajah, at which there is a great attendance of figures, and amongst them, one holding a cocoa-nut used on such solemnities. Below are sitting Gunnes, Brimha, &c. officiating at the marriage ceremony.

Re-entering the hall again from the left recess, there is on the left hand a group of Goura and Parwuttee in heaven supported by Rouon.

On each side of the pillars, before you enter the recess, are female figures.

On each side of the door of the temple in the recess are two gigantic and two smaller figures; the former said to be Ahraon Meyraon; the smaller ones Keyroo Bhut on the right, and Vishroo on the left, challenging each other to a combat of wrestling.

D d 2

Many
Many of the pillars of this cave are elaborately ornamented. Very near this cave is another small one containing the Ling of MAHDEW, which does not require particular notice, and still a little further, another of considerable dimensions, but quite plain, and almost choked up both within and at the entry.

There are also three or four other excavations of the same rank between the last mentioned and the next great work of Keylas.

**Dimensions.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of the hall, including the recess at</td>
<td>90</td>
<td>8</td>
</tr>
<tr>
<td>each end of nine feet each,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth of the cave, including the recess in</td>
<td>72</td>
<td>5</td>
</tr>
<tr>
<td>which the temple stands,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height,</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Square of the temple in the recess,</td>
<td>31</td>
<td>0</td>
</tr>
</tbody>
</table>

The front of this excavation has four pillars and two pilasters; and at the commencement of the recess, two pillars and two pilasters.

**KEYLAS alias PARADISE. Aspect West.**

This wonderful place is approached more handsomely than any of the foregoing; and exhibits a very fine front, in an area cut through the rock. On the right hand side of the entrance is a cistern of very fine water. On each side of the gateway, there is a projection, reaching to the first story, with much sculpture and handsome battlements, which, however, have suffered much from the corroding hand of time. The gateway is very spacious and fine, furnished with apartments on each side that are now usually added to the Dwellings of the eastern palaces. Over the gate, is a balcony, which
which seems intended for the Nobut Khanneh. On the outside of the upper story of the gateway are pillars, that have much the appearance of a Grecian order. The passage through the gateway below is richly adorned with sculpture, in which appear Bou-annee Ushtbooza on the right, and Gunnes on the left. From the gateway you enter a vast area cut down through the solid rock of the mountain to make room for an immense temple, of the complex pyramidal form, whose wonderful structure, variety, profusion, and minuteness of ornament, beggar all description. This temple, which is excavated from the upper region of the rock, and appears like a grand building, is connected with the gateway by a bridge left out of the rock, as the mass of the mountain was excavated. Beneath this bridge, at the end opposite the entrance, there is a figure of Bou-annee sitting on a lotus, with two elephants with their trunks joined, as though fighting, over her head. On each side of the passage under the bridge is an elephant, marked (a) in the plan Plate G, one of which has lost its head, the other its trunk, and both are much shortened of their height by earth. There are likewise ranges of apartments on each side behind the elephants, of which those on the left are much the finest, being handsomely decorated with figures. Advanced in the area, beyond the elephants, are two obelisks (b), of a square form, handsomely graduated to the commencement of the capitals, which seem to have been crowned with ornaments, but they are not extant, though from the remains of the left hand one, I judge them to have been a single lion on each.

To preserve some order, and thereby render easier the description of this great and complex work, I shall, after mentioning that on each side of the gateway within there is an abundance of sculpture, all damaged by time, proceed to mention the parts of the centre structure; and then, returning to the right side, enumerate its parts; when taking the left hand, I shall terminate the whole in a description of...
the end of the area, opposite to the gateway and behind the grand temple. Exemplifying the whole by references to the annexed plan.

CENTRE BELOW.

Passing through the gateway (1) below, you enter the area (2), and proceeding under a small bridge, pass a solid square (3) mass which supports the bull Nundee stationed above; the sides of this recess are profusely sculptured with pillars and figures of various forms; having passed it, you come to the passage under another small bridge, beneath which there is, on one side, a gigantic sitting figure of Raja Bhoj surrounded by a group of other figures. Opposite to which is as gigantic a figure of Guttordhuj, with his ten hands. At the end of this short passage commences the body of the grand temple (4), the excavation of which is in the upper story that is here ascended by flights of steps on each side (5).

RIGHT AND LEFT HAND SIDES OF THE TEMPLE BELOW.

The right hand side is adorned with a very full and complex sculpture of the battle of Ram and Rouon, in which Hunomaun makes a very conspicuous figure. Proceeding from this field of battle, the heads of elephants, lions, and some imaginary animals, are projected as though supporting the temple, till you come to a projection (6), in the side of which, sunk in the rock, is a large group of figures, but much mutilated. This projection was connected with the apartments on the right hand side of the area by a bridge (7), which has given way, and the ruins of it now fill up the sides of the area. It is said to be upwards of 100 years since it fell.

Passing the projection of the main body of the temple, it lessens for a few paces, then again projects (8), and after a very small space on the line of
of the body of the temple, the length of this wonderful structure, if what is fabricated downwards out of a solid mass can be so called, terminates in a smaller degree of projection than the former. The whole length is supported, in the manner above mentioned, by figures of elephants, lions, &c. projecting from the base, to give, it should seem, the whole vast mass, the appearance of moveability, by those mighty animals. The hindmost, or eastern extremity of the temple, is composed of three distinct temples elaborately adorned with sculpture, and supported like the sides, by elephants, &c. many of which are mutilated. The left hand side (I mean from the entrance) differs so little from the right, that it is unnecessary to be particular in mentioning any thing, except that opposite the description of the battle of Ram and Rouon, is that of Keyso Pando, in which the warriors consist of footmen, and others mounted on elephants, and cars drawn by horses, though I observed none mounted on horses. The principal weapon seems the bow, though maces and straight swords are discoverable.

CENTRE ABOVE.

The gateway consists of three centre rooms (9) and one on each side (9). From the centre rooms, crossing the bridge (10), you ascend by seven steps (11) into a square room (12), in which is the bull Nundee. This room has two doors and two windows. Opposite the windows are the obelisks (b) before mentioned.

From the station of Nundee, you cross over the second bridge (13), and ascend by three steps (14) into a handsome open portico (15), supported by two pillars (above each of which, on the outside, is the figure of a lion, that though mutilated, has the remains of great beauty, and on the inside, two figures resembling sphynxes) towards the bridge, and two pilasters that join it to the body of the temple, the grand apartment of which (16) you enter from the portico
portico by four handsome steps and a door way, on each side of which are gigantic figures. Advancing a few paces into the temple, which is supported by two rows of pillars, beside the walls that are decorated with pilasters, there is an intermission of one pillar on each side, leading to the right and left, to an open portico (17), projecting from the body of the temple, from the right hand one of which, the bridge already mentioned as broken, connected the main temple with the side apartments, to which there is now no visible access, but by putting a ladder for the purpose, though I was told there is a hole in the mountain above that leads into it, which I had not time nor strength to explore. The access to the opposite is by stairs from below. The recess (18) of the Ling (19) of Mahdew to which there is an ascent of five steps, forms the termination of this fine saloon, on each side of the door of which is a profusion of sculpture. The whole of the ceiling has been chunamed and painted, great part of which is in good preservation.

A door (20) on each side of this recess of the Ling of Mahdew leads to an open platform (21), having on each side of the grand centre pyramid, that is raised over the recess of the Ling, two other recesses (22), one on each side, formed also pyramidically, but containing no image. Three other pyramidical recesses (23), without images within them, terminate the platform, all of them elaborately ornamented with numerous figures of the Hindu mythology. Many of the outer as well as the inner parts of this grand temple are chunamed and painted. The people here attribute the smoky blackness of the painting within, to Aurungzebe, having caused the different apartments to be filled with straw and set on fire; which I can reconcile on no other ground, than to efface any (if any there were) obscenities, as there are many in the sculpture. Upon the whole, this temple, of which I was too much indisposed to give even the inadequate account that I might, if in perfect health, has the appearance of a magnificent fabric,
bric, the pyramidal parts of which seem to me to be exactly in the same style as that of the modern Hindu temples.

**RIGHT HAND SIDE OF THE AREA.**

This side of the rock has a continuance of excavations, as marked in the plan, but all those below, except the veranda, which I shall quit for the present, are of little note, and those above, of three stories called Lunka (24), which appear much more worthy of attention, are inaccessible, but by a ladder, from the fall of the bridge; I shall therefore proceed to the

**LEFT HAND SIDE OF THE AREA,**

In which there are excavations of some consideration below, from which you ascend to an upper story called Pur Lunka, by an indifferent stair-case, into a fine temple (25), at the extremity of which is a recess containing the Ling of Mahdew, and opposite thereto, near the entrance from the stair-case, is the bull Nundee, with two large fine figures resting on maces on each side of the recess in which he sits. The ceiling of this temple is, I think, lower than any of the foregoing. The whole of this temple is in fine preservation, strongly supported by very massy pillars, and richly ornamented with mythological figures, the sculpture of some of which is very fine. The ceiling, like the others, has the remains of painting visible, through the dusky appearance of smoke, with which it is obscured. Descending from Pur Lunka, you pass through a considerable insculptured excavation (26) to a veranda (27), which seems allotted to the personages of the Hindu mythology, (a kind of pantheon) in open compartments: these figures commence on the left hand with—1st, the Ling of Mahdew, surrounded by nine heads, and supported by Rouon. 2d, Goura Parwuttee, and beneath Rouon writing. 3d, Mahdew, Parwuttee, and beneath Nundee. 4th, ditto ditto. 5th, Vishnu. 6th, Goura. Parwuttee. 7th, a Bukta, (votary) of Vishnu with his
his legs chained. 8th, GOURA PARWUTTEE. 9th, ditto. N. B. These representations of GOURA and PARWUTTEE all differ from each other. 10th, ditto. 11th, VISHNU and LUCHMEE. 12th, BUL BUDDER, issuing from the Pind, or Ling of MAHDEW. Here ends the left hand side, and commences the eastern extremity or end of the area (28), in which the figures are continued, viz. 13th, GOURA and PARWUTTEE. 14th, BEHROO, with GOVIN RAJ, transfixed on his spear. 15th, DYTASEER on a chariot, drawing a bow. 16th, GOURA and PARWUTTEE. 17th, KAL BEHROO. 18th, NURSING Outar, issuing from the pillar. 19th, KAL BEHROO. 20th, BAL BEHROO. 21st, VISHNU. 22d, GOVIN. 23d, BRIMHA. 24th, LUCHMEDASS. 25th, MAHMUND. 26th, NURRAIN. 27th, BEHROO. 28th, GOVIN. 29th, BAL BEHROO. 30th, GOVIN RAJ and LUCHMEE. 31st, KISSUNDASS. Here ends the veranda of the eastern extremity, and I now proceed with that on the right hand (29) having in my description of that side stopped at the commencement of this extraordinary veranda for the purpose of preserving the enumeration of the figures uninterrupted, viz. 32d, MAHDEW. 33d, ITTULDASS. 34th, DHURM RAJ, embracing UGGAR KAUM. 35th, NURSING destroying BURN KUSH. 36th, VISHNU sleeping on SEYS NAUG, the KUMMUL (lotus) issuing from his navel, and BRIMHA sitting on the flower. 37th, GOVERDHUN. 38th, MAHDEW BULLEEE, with six hands. 39th, KRISHNA, sitting on GURROOR. 40th, BHARRA OUTAR. 41st, KRISHNA CHITTERBOOZ trampling on CALLEA NAUG. 42d, BALLAJEE. 43d, ANNA POOMA. It is to be observed, that almost all the principal figures are accompanied in their respective pannels by others explanatory of the character of that part of the history of the idol in which it is represented. Had not my strength failed me, I should have been much more particular than I have been, in this and every other part of so wonderful a place, though the utmost minuteness could not have done
done justice to it. I am sorry to observe, that from the appearance of the hill above this veranda projecting greatly beyond the pillars at the eastern extremity, (as marked in the plan by the line 30) the water, during rains, must fall into the area in a perfect torrent, or cascade, of the whole height of the superincumbent rock, a number of loose pieces of which, lying on the slope above, seem ready for precipitation down the scarp.

Dimensions of the Keylas.

<table>
<thead>
<tr>
<th>Outer area, broad</th>
<th>Feet</th>
<th>Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>138 0</td>
<td></td>
</tr>
<tr>
<td>Ditto, deep</td>
<td>88 0</td>
<td></td>
</tr>
<tr>
<td>Greatest height of the rock through which the outer area is cut</td>
<td>47 0</td>
<td></td>
</tr>
<tr>
<td>Gateway, height</td>
<td>14 0</td>
<td></td>
</tr>
<tr>
<td>Ditto, breadth, without the modern building</td>
<td>14 4</td>
<td></td>
</tr>
<tr>
<td>Passage of the gateway, having on each side rooms, fifteen feet by nine</td>
<td>42 0</td>
<td></td>
</tr>
<tr>
<td>Inner area, or court, length from the gateway to the opposite scarp</td>
<td>247 0</td>
<td></td>
</tr>
<tr>
<td>Ditto breadth</td>
<td>150 0</td>
<td></td>
</tr>
<tr>
<td>Greatest height of the rock, out of which the court is excavated</td>
<td>100 0</td>
<td></td>
</tr>
</tbody>
</table>

**LEFT SIDE OF THE COURT, LOWER STORY, VIZ.**

A small cave—in front, two pillars, and a pilaster at each end, with three female figures buried up to the knees, with rubbish, length; 22 6

Ditto, ditto ditto, breadth; 8 0

Ditto, ditto ditto, height; 9 8

Another excavation, in front five pillars, two pilasters, length; 57 9

Ditto, breadth, within the benches that are round this cave; 6 0

Ditto, height, at the end of this is a stair-case to the upper story; 10 4

Interval unexcavated; 20 0

Another excavation, having two large square plain pillars, and two pilasters
in front, with a bench round the inside, the rock projecting beyond the pillars, length, 

Ditto, ditto ditto, breadth, 

Ditto, ditto ditto, height, 

Door-way, leading to a gallery or veranda, five feet eleven inches high, by two feet nine inches wide. Gallery, containing figures. Length from the door-way to the extreme depth of the whole excavation, 

Ditto, broad, 

N. B. In this length are eleven pillars, each two feet eight and a half inches square.

Ditto, height within the pillars. The projecting rock is about three feet lower, extending irregularly in the course of the length from seven to thirteen feet beyond the pillars, 

END OF THE AREA OPPOSITE THE GATEWAY BEHIND THE TEMPLE.

Whole breadth from side to side, measuring from the inner wall of the gallery on each side, 

Breadth of the gallery, including the pillars, there being seventeen in this range, 

N. B. The rock projects beyond the pillars along this range and the right hand one irregularly from fifteen to twenty-two feet, and is lower than the ceiling.

RIGHT HAND OF THE COURT, LOWER STORY, VIZ.

Figure gallery, or veranda, of the same dimensions as the preceding parts of the same gallery for the space of ten pillars, the angle one being included in the foregoing; three of which are broken, it is said to make trial of the power of the deity of the place, and
when it was found that the superin-
cumbent rock did not sink, the tempt-
er, said to be "Aurungzebe," forebore
further trial.

Door-way, two feet four inches broad, by
five feet high, leads to a veranda, within
this veranda is a room of sixty feet by
twenty-two and eleven feet four inches
high. Right end unfinished.

Length, 60
Breadth, 17
Height, 13

A small projecting room, fifteen feet by
thirteen, and six feet high, being choked
with several finely sculptured figures.

An excavation raised twelve feet from the
surface of the court.

Length, 36 10
Depth, 14 9
Height, 12

There is a multiplicity of figures in this
apartment, detached from the wall.
Amongst the rest a large skeleton figure
with a smaller one on each side. The
principal is sitting, with each foot on a
prostrate naked figure.

An excavation, which has a small recess,
opposite the entrance, of six feet by
seven and eight high. Length, 24
Depth, 18
Height, 10

An excavation terminating the lower story,
on the side, length, 24
Ditto, depth, 10
Ditto, height, 11 6

except between the two pillars, where
the roof is arched, the first instance I
have seen of the arch, and is there four-
teen feet eight inches high.
DESCRIPTION OF THE CAVES, &C. ON THE
LEFT HAND SIDE, UPPER STORY, VIZ.

A small unfinished excavation, the dimensions of which were not worthy taking. *Pur Lunka*, is a fine large excavation, ascended by a flight of twenty-five steps, and a doorway of three feet eight inches broad, by seven feet seven inches high, length, exclusive of the recess, in which is the temple of *Mah dew*, 70 7

| Ditto breadth | - | - | - | 61 9 |
| Ditto height  | - | - | - | 14 6 |

Recess, in which stands the temple of *Mah dew*, depth, 26

| Ditto breadth | (N. B. the temple on the outside is twenty-six by twenty feet). | 39 |

N. B. The whole of this apartment is full of figures, some very finely sculptured, and the centre floor is raised one foot, and the ceiling in proportion.

RIGHT HAND SIDE, TWO STORIES.

FIRST STORY.

A large room, formerly connected with the grand temple by a bridge, now broken down, depth, 18

| Ditto length, laterally | 60 |
| Ditto height | 16 |

Another room, within the foregoing, entered by a door from it, having a bench all round, this inner room is very dark, having no light but from the doorway, depth, 29

| Ditto length, laterally | 36 |
| Ditto height | 11 |

SECOND STORY.

Entered by a stair case from the right side of the foregoing of twenty-four steps. A large room of the same dimensions as a correspondent one below, except two feet less in the height

Another room within the foregoing, depth, 35
Another room within the foregoing, length, 37
Ditto, height, - - 14
The rock seems to have given way in the centre of this room, and the rubbish has fallen in.

CENTRE.

Balcony over the gateway, fourteen feet by eight, and eight high. A room within it nine feet square, and about nine high. Another within it, same dimensions. One on each side from the centre, twenty-two by fifteen each. Bridge, twenty feet by eighteen, with a parapet three feet six inches high. Ascent by nine steps from the bridge into a distinct room, in which is the bull Nundee, sixteen feet three inches square. Another bridge, twenty-one feet by twenty-three broad, leading to the upper portico of the temple. This portico with the parapet wall is eighteen feet by fifteen feet two inches, and seventeen high: within a bench that is rounded of four high by three feet seven inches broad. You can enter this portico from the gateway by a passage that the filling up of the rubbish has afforded, but the proper passage is by flights of steps on each side, of thirty-six steps each, leading up on each side the body of the temple.

GRAND TEMPLE.

Door of the portico, twelve feet high by six feet broad, length from the door of the portico entering the temple, to the back wall of the temple, 103 6
Length from the same place to the end of the raised platform behind the temple, 142 6
Greatest breadth of the inner part of the temple, - - 61
Height of the ceiling, - - 17 10
Two porches on each side, measured without, thirty-four feet ten inches by fifteen feet four inches. The particulars of the intricate measurement
DESCRIPTION OF THE CAVES, &C. ON THE

Siuemeit of this fine temple will be best understood from the plan formed on the spot.

Height of the grand steeple or pyramid computed about ninety feet from the floor of the court and of the smaller ones about fifty. Height of the obelisks about thirty-eight feet. Base eleven feet square, being eleven feet distant from each side of the room in which is the bull Nundee. The shaft above the pedestal, is seven feet square. The two elephants on each side the court or entry are larger than life.

DUS OUTAR. Aseet W.

A very small distance from Keylas. The access to it is by very rough steps in the rock, and the original entry being built up, you enter over the wall on the right hand into an excavated square area, on the left hand side of which is a small excavation. The middle of the area is occupied by what has been a very handsome square apartment, the ascent to the veranda of which, fronting the gateway, was by a handsome flight of steps, forming a portico, the roof of which veranda was supported by two pillars, one of which having given way, the roof has fallen. The front of this square has a stone lattice in the centre, and figures in the compartments on each side. The top has been adorned with figures. The two corner ones seem to have been lions, but time has destroyed their form. On the right of this square apartment is a dry water cistern, but on the left there are cells with fine water and plenty, and I dare say a little care would supply the other. The front of the area is greatly filled up with earth from the surrounding hill, and no preventative now appears to its washing in with the rain. The entrance into the square apartment is from the main structure if, as I have before observed, I may so denominate what has been fabricated downwards which consists of two stories, having, both above and below, a front of six pillars and two pilasters. It appears to have been filling up fast, to
prevent which, by a very temporary remedy, a trench is cut in the area in front of the fabric, and close to it. The lower story is quite plain, with two recesses or courts at each end, and all the pillars are devoid of ornament, being extremely square and massive. The passage into the upper story having been stopped up, it was with great difficulty I ascended through a small hole on the left hand side. The room above is of great dimensions, supported by eight rows of pillars in depth, all of which are square and quite plain, except the front row. At the extremity of the centre aisle is a recess, containing the Ling of Mahdev; and in the front of it, near the opposite end, is the bull Nundee, but without his head. The lateral walls, as well as that on each side the recess of Mahdev at the end, are adorned with mythological figures in very high preservation, and amongst which the Dus Outar (or ten incarnations) are conspicuous, whence I presume the place is named. In the centre of each side of the lateral walls there is an altar.

Dimensions.

<table>
<thead>
<tr>
<th>Lower story, having a front of six pillars and two pilasters.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length,                                  Feet. Inches.</td>
</tr>
<tr>
<td>Depth,                                    103 3</td>
</tr>
<tr>
<td>Height,                                   46 4</td>
</tr>
<tr>
<td>Ditto, depth                              14 9 1/2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Upper story, having the same front as below, greatest length,</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ditto, depth                                               96 5</td>
</tr>
<tr>
<td>Ditto, the same as below, height,</td>
</tr>
<tr>
<td>Recess, depth                                             14 0</td>
</tr>
<tr>
<td>Ditto, lateral, length,</td>
</tr>
<tr>
<td>Square structure in the area, length,</td>
</tr>
<tr>
<td>Ditto, breadth,</td>
</tr>
<tr>
<td>Ditto, height,</td>
</tr>
</tbody>
</table>

Vol. VI.  E e  TEEN
DESCRIPTION OF THE CAVES, &C. ON THE

TEEN TAL. Aspect W. 10 S.

Proceeding a few yards to the southward of Dus Ou-tar, you reach the excavation called Teen Tal (or three stories). The entrance to this structure is from a level surface, through a good gate, in a wall left as the rock was hewn, into a fine area, as yet but little choked with earth or fragments. The front of this excavation has a fine and simple appearance, being composed of eight square pillars and two pilasters in each story, all of which are unadorned, except the two centre ones of the ground story, the ornamenting of which, however, has not affected their quadrangular form. After entering the area a few paces, it widens, and in the left hand corner is a reservoir of fine water; indeed, all the water in these cisterns is uniformly fine and clear. In the side of the area, opposite the water cistern, is a raised excavation, but of no note. The lower story consists of six pillars in depth, and at the extremity of the middle aisle, is a recess containing a gigantic image of Seys. Proceeding up the middle aisle, the excavation narrows at the fourth pillar, and continues so to the end, having on each side a small room, and in the next pannel on each side two very large sitting figures; that on the right of Sukur Achary, and on the left of Adnaut. On each side the door there are also large figures. Ascending from the ground floor by a good stair case on the right hand side, the raised recess mentioned above fronts you, which has a large sitting figure of Covere, and several others, that in any other place would not be unworthy notice. Proceeding to ascend by the same fine stairs, you enter the noble veranda of the second story, opposite the entrance of which is a recess with the figure of Jum seated in it. There is a door-way at each end of the veranda leading to four rooms in each extreme side of the rock. From these doors, the wall of the rock is continued to the third pillar on each side, and to the second in depth, to give space for two rooms on each side, but without figures. This continuation of the wall narrows the open-
ing of the temple within the veranda to two pillars and two pilastrers. At the extremity of the centre aisle is a recess, containing a very large sitting figure of Luckmon, with two gigantic figures on each side of the door. But before you reach the recess, the room lessens again from the innermost row of pillars, to give space for two small rooms on each side. The greatest depth of this fine room has six pillars clear of wall, all of which are square and plain. Ascending from this story by a stair case at the opposite end of the veranda by which you enter it, but equally light and easy of ascent, you enter the third story, by a door, on the left of which in the landing place, is a small room, and opposite the entrance, at the end of the veranda, is a gigantic figure of Sey Dew; on his left, continuing by the lateral wall is, Lukkool; next to him, Bheem; then Arjun; then Dhurm raja; being the five sons of Pundoo. Opposite to whom are, in similar niches, the figures of Oodo, Mado, Penda, and Sudan, the space of the door occupying that of a fifth figure opposite to Sey Dew. Advancing through the middle aisle of this very fine temple, it is lessened at the six pillars to make room, on each side of the great recess, for fourteen sitting figures with curled hair. Advancing from hence, you enter a kind of vestibule, very richly decorated with figures standing and sitting. And in the centre is a door leading into a recess, into which you descend by three steps. In front of the door there is a gigantic figure of Ram, sitting on a throne or altar, and attended on each side by the usual deities employed in his service. Seta being placed on the left hand side of the door on the wall opposite to him. All the pillars of this very fine and capacious temple are square and plain, but the ceiling has the remains of painting.

Dimensions of Teen Tal.

**Lower Story.**

<table>
<thead>
<tr>
<th>Depth of room,</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>E e 2</td>
<td>41</td>
<td>6</td>
</tr>
</tbody>
</table>

Length,
**DESCRIPTION OF THE CAVES, &c. ON THE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of room,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height ditto,</td>
<td>117</td>
<td>6</td>
</tr>
<tr>
<td>Recess deep,</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Room in the recesses, deep,</td>
<td>43</td>
<td>5</td>
</tr>
<tr>
<td>Ditto, broad,</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Ditto, high,</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>Image fitting high,</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Room in the first landing place going up stairs twenty-five by twenty feet.</td>
<td>11</td>
<td>3</td>
</tr>
</tbody>
</table>

**Twenty-four steps ascending to the second story.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of veranda,</td>
<td>114</td>
<td>5</td>
</tr>
<tr>
<td>Depth from the wall of veranda to the recesses</td>
<td>66</td>
<td>6</td>
</tr>
<tr>
<td>Height of ceiling,</td>
<td>12</td>
<td>3½</td>
</tr>
<tr>
<td>Recess, deep</td>
<td>16</td>
<td>0</td>
</tr>
</tbody>
</table>

**Twenty-four steps ascending to the third story.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of veranda,</td>
<td>110</td>
<td>5</td>
</tr>
<tr>
<td>Depth to recesses,</td>
<td>66</td>
<td>9</td>
</tr>
<tr>
<td>Ditto of recesses,</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td>Height of ceiling,</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Area, viz.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greatest depth,</td>
<td>79</td>
<td>0</td>
</tr>
<tr>
<td>Ditto breadth,</td>
<td>110</td>
<td>0</td>
</tr>
</tbody>
</table>

**Gateway, eight feet broad by eleven high.**

**BHURT CHUTTURGHUN. Front W. 10 S.**

This is an excavation of two stories, or but of two remaining above ground, in good preservation, the stair case of which being choked up, you enter by the wall of the veranda. After the former descriptions, there is nothing in this worthy of being particularized. It seems to
to take its name from its dedication to Bhurt and Chutturghun, two brothers of Ramchunder, whose figures, by the Brahmen's account, are the chief ones in this place.

Dimensions.

Area, length, - - - 102 3
Ditto, depth, - - - 25 0
Lower story—veranda the same length as the area. Breadth, within the pillars, - - - 8 5
Sixteen steps to the upper story of veranda, length, - - - 102 10
Depth from veranda to the recess, - - - 44 4
Breadth of recess, - - - 33 0
Depth of ditto, - - - 10 6
Height of ceiling. - - - 9 6

BI SKURMA, or Viswakurma ka Jompree, or Biskurma.

The Carpenter's Hovel. Front, W. 5. S. (H. I.)

According to the legend, Biskurma* was the artist, who fabricated the whole of these wonderful works in a night of six months; but the cock crowing before they were finished, they remained imperfect, and he retired, having wounded his finger, to this his hovel, in which statue the figure in front (1) of the entrance of this beautiful excavation is said to be a representation of him holding the wounded finger; but I rather think, with all due respect to the legend, that the figure is in the act of devout meditation, as many fingers, with similar positions of the hands, occur. But quitting the fable for the fact, this excavation is said to be a representation of Ram. In form it is unique, and in design elegant. The portico is light, and striking to the beholder. On the right hand, as you enter, is a fine cistern of water.

* Creator of the world, but allegorically, artificer of Ram.
Above the gate-way (H), which is richly sculptured on the outer side, is a balcony, which seems well suited, if not intended, for a musick gallery, to the interior temple (I), which has the appearance of an elegant chapel, with an arched roof, and is exactly in the style of a similar excavation at Kenara on the island of Salsette, and another at Ekvera, near the top of Bhore Ghaunt, first explored by Mr. Wales, the painter. At the upper end is the figure (i) above mentioned. From the ceiling are projected stone ribs, following the curvature of the arch to the capitals of the pillars on each side through the whole length of the excavation. Beside the grand aisle, or body, of the excavation, there is a small passage formed by the row of pillars on each side round the altar, but it is dark and narrow. This singular form of cave, wherever I have met with it, has conveyed the same impression of its being a place of congregation and adoration, rather than of residence or habitation, and has given rise to an idea in my mind, from the orbicular ceiling, and the name and attitude of its inhabitant, that it may be meant to represent the Almighty, meditating the creation of the world; under the arch or canopy of unlimited space. It is necessary however, to accompany this idea, with an acknowledgement, that the similar caves of Ekvera and Kenara, are not inhabited by Biskurma. They having only a very high altar, the top of which is circular, and situated as represented in the annexed drawing at the back of Biskurma.

Dimensions.

<table>
<thead>
<tr>
<th>Description</th>
<th>Feet</th>
<th>Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area, square,</td>
<td></td>
<td>49</td>
</tr>
<tr>
<td>Veranda below, in front, and each side having twelve pillars and two pilasters, broad,</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Ditto roof, high,</td>
<td></td>
<td>10 4</td>
</tr>
<tr>
<td>Door-way, four feet broad by eight feet four inches high, gallery above the door, square,</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Length
MOUNTAINS TO THE EASTWARD OF ELLORA. 423

Length of the temple from the entrance to the opposite wall behind the altar, - 79 0
Breadth of ditto from wall to wall, - 43 5
Height of ditto from the centre of the arch to the floor, - - 35 0
N. B. The height between the pillars and the wall where the the ceiling is flat, is, 14 10
Breadth between the pillars and wall, - 7 8
Circumference of pillars (two square and twenty-eight octagon ones), - - 8 1

Altar at the end about twenty-four feet high.

DEHR WARRA, or the HALLALCORE'S QUARTER. Front, bearing from Jugnath Subba, distant about a mile, S. 25 E.

By this designation, have the Brahmens, who describe them, thought proper to discriminate this group of caves, which, though making no conspicuous figure here, would render any other place illustrious. They under this term of pollution, endeavour to deter visitors from entering it, though the large cave is a very fine one, over the front of which a little river must rush in the rainy season into the plain below, forming a sheet of water, that, in a beautiful cascade, must cover the front of the excavation as with a curtain of crystal. There are two stripes of stone that run parallel to each other along the floor, from the entrance, the whole depth of this cave (the prospect from which, of the great tank, town, and valley, of ELLORA, &c. is beautiful) and seem intended as seats either for students, scribes, or the sellers of some commodities, a convenient passage lying between them up to the idol at the end of the cave. N. B. The annexed sketch (Plate K.) was taken from a station near (3) on the right, or northern, side of the excavated hill.

REMARKS
XI.

REMARKS ON SOME ANTIQUITIES

ON THE WEST AND SOUTH COASTS OF CEYLON;

WRITTEN IN THE YEAR 1796.

BY CAPTAIN COLIN McKENZIE.

The island of Ceylon, Selan-dive, or Seran-diep, supposed to be the Lanka of the Ramayan (though some Hindus assign it another situation) would naturally suggest some enquiry to the curious in Indian research with so favourable an opportunity as its late reduction to our power: and though a few months passed on its western coast, employed on objects of a very different nature, could not permit much observation (even if possessed of talents more adequate to the task) yet a desire of promoting the interesting objects recommended by the society, by pointing out to the curious in these pursuits some remains of Hindu antiquity on the south and western coasts of this island, which have casually fallen under my notice, tempts me to submit the following remarks to their consideration.

It may not be altogether foreign to this subject, as connected with the traditionary accounts of the reception of the sea at some remote period from these coasts, to remark some of those appearances which most forcibly strike an observer, travelling for near five hundred miles along the low flat country of the lower Carnatick; which in many places furnishes evident marks of its having been at one time covered by the sea, in the marine productions discovered in digging; the sea shells which are incorporated in the calcareous stones apparently
rently composed of these; and the level appearance of the surface of the land, devoid of wood of any long standing, except the groves which have been planted by the cultivators of the soil; and the several species of palm; with the jungle congenial to a sandy soil. One first remarks, on the coast of Marawar, specimens of the same coralline or marine productions, that in greater quantities are dug up at Delft, and some of the islands on the north coast of Ceylon, which indicate a connexion of the same materials, and which probably form the basis of the shoals, called Adam's bridge, between that island and the main. Parallel to the edge of the coast we also find along the margin of the sea a stratum of flat calcareous rocks, forming a kind of crust, probably a concretion of shells which abound here and on the coast of Ceylon, (as observed at Manar) and compose the greater part of the sand along the beach; and which probably also form the chain of low isles parallel to that part of the coast, called the Flat-isles, in the neighbourhood of the Chanque fishery.

The isle of Ramisur, the utmost limit of the Hindu religion in modern times, and of the conquests of the Dekan Mussulman princes, according to Firishta, lies near this coast; and is only separated by a channel of about two miles, too shoal to admit vessels of burthen. This island is low, sandy, and uncultivated; it is about eight miles to the pagodas (the resort of immense crowds of pilgrims at certain seasons) which are built near the sea, having in front an embankment of stone, yet unfinished; the houses of the Brahmans are built as usual in squares and straight streets, close to it; their rows of houses having mud terraces (Payals) in front, on which their women and children are often seen reclining under the shade of the thatched roofs. It is remarkable that the same fair complexion, and cast of features distinguising this class through all the different provinces, from eight to twenty degrees north latitude (and by all accounts still further) among nations varying so much in both,
as the Tamuls, the Tellingas, the Canarins, Mahrattas, and Orias, the five families which appear to compose the body of the original inhabitants of the peninsula, at present distinguished by different dialects, as by different features.

The buildings of the pagodas* are square and extensive, but have nothing remarkable, or superior in the stile, to the generality of those on the coast; which they resemble in the same crowded minute ornaments, the same spires† of brick work, with long porches in front, at the entry of which we were only permitted to peep through a long vista of doors, terminating before the deity of the place, whose image was placed at the furthest end of the penetralia of the temple, in too obscure a situation (though surrounded by lamps burning in day light) and at too great a distance to ascertain its shape and figure. At night a number of small lamps illuminated the inner recesses with a good effect. The same reserve which distinguishes the southern Brahmans in their temples, at Tanjore, Seringam, &c. prevented any communication here. We were told that no labour or cultivation is carried on in this sacred isle: safe emboomed amidst the waves they live on the contributions of the devout: several of the rajahs and Poligar chiefs of the neighbouring provinces expend large sums on establishments here. The vestibule or building on the east front of the pagoda, into which we were permitted to enter, is decorated with the statues of one of these benefactors (a chief‡ of the Tinivelly country;) and his ministers and attendants, standing in a row on either side in their proper dress: these statues, though preserving the dress and ornaments with a minute attention, have little else to recommend them, being deficient in symmetry and proportion; and the superiority of rank is distinguished by the size, according to the rule

* Coil, in Tamul. Devul, in Tellinga. The word pagoda is not known in these languages.
† Coverum in Tamul signifies a spire.  ‡ The Politaver. which
which seems observed in most of the sculptures on Hindu buildings. Among the figures carved on the outer walls the Lingam is frequently exhibited. On the west side of the square is another longer portico, having a number of statues, of another chief and his followers, placed on a raised stone terrace, on either side of the covered passage leading to the inner gate.

The guardianship of the sacred isle is in a family of Byraagees (devotees), the chief of which is doomed to perpetual celibacy; the succession being carried on by the sisters, or the collateral branch, who only are permitted to marry. This arrangement seems to have some affinity to that of the Travancore and Nair sovereigns. The present guardian is a child of six or seven years old; of a handsome mild aspect, and regular features; his dress and turban were of the Byraagee, tawny red colour, and decorated with the beads that this class of mendicants wear. This young pontiff received the European visitors, after landing, with great gravity and composure: his uncle, who was the efficient minister, attended and stood by his seat, to assist him in paying his compliments to his guests. From this pagoda a low tract of sandy ground stretches out towards the east to about twelve miles; terminating in a narrow spit of sand. Within a mile of the point is the choultry of Tona-goody*, a square of low houses inclosing a court, built for the accommodation of the pilgrims who came to this further point to perform their ablutions in the waves of the ocean, this being held one of the most sacred and purest ablutions required by their religion. A Brabmen resides at this choultry. A pole is erected on the point, to which lights are affixed at night; whether for the direction of mariners, or a religious motive, we could not learn. The whole of this tract from Ramiferum has the appearance of being washed by the

* Goody also signifies a temple in the Tamil language; Tony signifies water. It is remarkable that good water is found on this point, though the spit of sand is so low.
feas, not a vestige of soil appearing. On entering our boat at seven A. M.* we were detained some moments to wait for our domesticks going through the necessary ceremonies and ablutions under the direction of the Brahmen; and hoisting sail for the land of demi-gods and Dewatas (the last object seen being the signal pole,) we coasted in sight and to the south of Adam's bridge, which we could only distinguish by the breaking of a surf on it at detached intervals, and came in sight of Talmanar, the west point of Manar, at two P. M. the course being E. S. E. The coast of this island at Talmanar and along its coast appeared low and covered with cocoa and other trees, and bushes, extending to the sand bank near the water's-edge.

The island of Manar is not high, has no hills, and appears to be a bed of shelly sand, worked up by the waves, and clothed with trees, among which the cocoa predominates. This island is separated from the main of Ceylon, as Ramiferum is from the coast, by a channel about two miles over; but this only appears at full tide, as the real channel or river, winding close to the fort, is very narrow, and though deeper than the rest, at the bar not above two and half feet at low water. Whether this narrow passage, and that of Pambam, are worn out by the action of the current setting in different directions along the coast, as the monsoon varies; or whether the islands, and the ridge of Adam's bridge, are thrown up and formed by the periodical winds and currents, acting on the shifting sands accumulated in the narrowest part of the Ceylon channel, is a subject of curious investigation, which would require some time and experience to examine: the enquiry might be rendered useful however, in suggesting means of deepening the channels, or preventing their being filled up when deepened, by the sand thrown in by the S. W. and N. W. monsoons†.

* January 6, 1796.
† Baldeus says, that the Portuguese fleet escaped through it; and that the Tewwer, or native governor, had a way of opening and filling up
It would be vain to look here for any traces of the earlier race: being naturally the thorough-fare passage into Ceylon, from the opposite coast, it would receive the impression of each successive race of invaders: accordingly we find its inhabitants now composed of a mixed race of Portuguese, Malabars, and Cingalese, with some Lobbees, the descendants of the Arab race, (the Mopillees of the Malabar coast,) who subsist here chiefly by fishing. I observed on this island some of those Byraagkees, so well known on the lower roads of the opposite coasts, constantly journeying from Benares to Ramesfur, carrying pots of the water of the holy spring, or Ganga water, flung on crosses bambooos, and distinguished by their tawny orange habit: these said that they were on their way to visit a famous pagoda in the interior parts of Ceylon, but I was not able to learn whether they had been usually permitted to cross over by permission of the Dutch government, or that they availed themselves of this opportunity of crossing in our boats: it shews at least that the connection of a similar religion has not been altogether lost.

Manar is memorable in Cingalese history, as giving refuge to the queen Donna Margaret, the last scion of the ancient royal race, whom the Portuguese thence carried into the heart of Ceylon, to cover their interference in the government, until they were driven out by the weight of accumulated crimes and degeneracy, to make way for the fordid monopolizing yoke of the Dutch, which locked up from mankind the natural treasures and valuable productions of this celebrated island. It was then divided into parishes with their churches. The fort is on a small scale, square and regular, nearly what Baldeus and Valentyn more lately describe it, but the city exists only in a few tiled houses of the officers of government, and some low huts covered and

up the passage at Pambar; this seems founded on mistake, and these Portuguese frigates must have been light shallops or floops drawing little water.—Page 706.
enclosed with Cadjan leaves, inhabited by boatmen and fishermen. At low water, a small river winds, and divides the island from the main; but when the tide flows, the whole intermediate space between the opposite shores appears like an arm of the sea from two to three miles over, in which we see men and cattle wading across from the isle to the main. A species of heron, and tall birds of the *Cyrus* kind, make an uncommon figure in this view; standing and picking up their food in the midst of the sea.

The opposite coast of *Ceylon* is low and woody; the appearance of the shores indicates some extraordinary change, such as to have laid it under water; which is however contradictory to the received traditions of the sea's receding from the opposite coasts. Are we then to suppose that in retiring from the peninsula, the waves inundated the lower coasts of this island? Or, that these contradictory changes happened at different periods? These might in some measure be explained by an enquiry into the soil and strata of the *Wannie*, or low woody country of the north of *Ceylon*, and comparing it with the low land of *Payen Ghaut*; as facts and experiments will ascertain their similitude. It may be remarked however that exclusive of the five northern islands, the greater part of what formed the north extremity of the island, distinguished by the name of the kingdom or government of *Jaffanapatam*, is low, and separated by shallow channels, which in the rainy season divide it into so many islands.

The whole of this low land, forming the north part of the island, is covered thick with woods and jungles; this tract is called *Wannie*, and is estimated to contain 900 square leagues. The forest extends quite across from west to east and to the south, to the chain of mountains which connects the bases of the land, and gradually terminates in lower hills, and swelling grounds.
grounds, in the neighbourhood of Galle and Matura. The remarkable peaks of these hills are well known to navigators on the east coast under the names of the Friar's-hood, the Chimney, the Elephant, &c. on the west coast; the most remarkable seen is Adam's-peak, which towers considerably above the rest to the east of Colombo.

From Manar none of these eminences are seen; the edge of the coast appears cultivated with rice; but the habitations are detached, and though divided into townships, are not collected together. This cultivation extends for about twenty-four miles and beyond Aripo; some churches are built in this tract. The forests and jungles now approach the coast, and for four days journey separate the northern more inhabited district from the southern at Chilaw, where the Cinnamon or Cannel land begins.

Some remains of antiquity being said to exist at Mantotte on the opposite side to Manar, I was conducted to the place, where a Gentoo city was said to have been built formerly; some mounds resembling the remains of the embankments of the Carnatick tanks, and some brick ruins, were the only vestiges to be seen, not far from the Portuguese church. Little information could be derived from the inhabitants, and curiosity here could find little gratification in the thick jungle, in which patches of paddy fields were interpersed. Of the palace or dwelling of the rajah, or place pointed out as such, nothing could be seen (and that with difficulty from the jungle) but a small square, of brick walls, now about four feet high, and subdivided into three apartments, appearing very like the gateway which generally forms the first entrance of the enclosure of a pagoda or great Hindu building: the approach of evening hindered any further attempt to explore this jungle. From some traditions of its former riches, searches have been recently made among
among these ruins; Valentyn mentions some gold medals dug up, supposed to be Roman.

**FIGURE OF THE COUNT RAJA.**

March 30, 1796.—Near Belligam or Velligam, ten miles N. from Matura near the road side, which passes among thick woods and plantations, is the figure of the Coutta raja, sculptured on a rude block of granite, about thirty feet high. Having previous notice of the place, from some Dutch gentleman at Galle, I was brought there at seven in the morning. On my way to Matura, and opposite to this stone, about twenty feet off, is another of nearly the same size, and the ground between both is worked away to a hollow, on which it is necessary to be placed, to have a full view of this figure, which is cut out of the stone in relief, but the whole is sunk in a hollow scooped out, so that it is thus defended from injury on the sides. The figure may be about fourteen feet high; the countenance mild; a full round visage; the eyes long, and the nose round and long: it has no beard; nor the usual distinguished marks of the Gentoo cast. I have been more particular in describing the features; as those of the Cingalesa race are very different from the Malabars, and seem well preserved in the statues, and figures in their temples.

* On my return from Galle, in March 1796, a silver coin was given me at Caleture, part of a number, upwards of three hundred, found twelve years ago; at Paffum, a place nine hours journey from Jaffanapataum near the sea coast, on the road towards Trinkomallee; it accompanies this paper.

† If the accompanying Linga, the only one of the kind within my observation, was really found here, as I am assured it was, there can be little doubt of its being a Hindu town. The inscriptions from which the medals were supposed to be Roman are doubtful, and it is not improbable but the letters might be mistaken; though at Nellore of late years some Roman coins were found; and it is not surprising to meet the coins of a nation which carried its commerce into India, on a coast whose productions always invited the settlement of foreigners. The date of this settlement seems yet involved in obscurity.

† Plate, No. 1.
He holds up both his hands, with the fore fingers and thumbs bent; the head dress is high, and seems ornamented with jewels; on the little finger of the left hand is a ring; on the arms bracelets; a belt high about the waist; the lower dress, or drapery, fixed with a girdle much lower than in the Gentoo dress, from which something like taffets depend; a collar and ornaments on the neck and shoulders; and rings seem to hang low from the ears: no appearance of any arms or weapons.

On the spot I was told that this was the figure of an ancient prince called Coutta raja, from a cutaneous disorder he had been troubled with; that his figure was placed here in memory of his being the first who had taught the inhabitants the use of the cocoanut, which is a principal part of the food of the Cingalese, particularly the slaves and poorer people. At Matura, the tradition of the Coutta raja was told much to the same purpose, but with more amplification of circumstances. They described him as the son of the sovereign of a foreign land, who labouring under a malignant cutaneous disorder or leprosy, was landed on the coast, and left to shift for himself; when he was cured by aid of a holy recluse, residing in these woods, and by the milk of the cocoa tree; returning home to his native land, he recounted his wonderful cure, and was sent back with rich presents to reward the holy man, whom they found no more. In memory of this the statue was set up. Whatever degree of credit we may give to this story, the name of the Coutta raja seemed to be familiar to all ranks, and is no doubt connected with some historical event.

TEMPLE OF BOODHOO AT VILLIGAAM.

March, 30,—Passing on from the figure of the Coutta raja, we came to Villigāam or Billigāam, a place of some consideration, near a bay of the coasts; houses are scattered about, among the trees and cocoa woods, which
which obstruct all view and give the idea of a thick planted grove or garden rather than of a village. Being desirous of seeing a Cingalese temple here of some repute, I was conducted by a winding road of about half a mile, to a small eminence enclosed at top by a low stone wall, surmounted by a kind of balustrade in the midst of thick surrounding groves. At the gate, to which we ascended by some steps, the priests received and conducted me to the door of the temple; they were bare-headed, and their hair cut close; they had none of the distinguishing marks worn by the Hindus, on the forehead; their garment consisted of a cloth of a dusky snuff colour, which folded round the body and descended to the feet; their dark complexions, and inanimate features, exhibited no symptom of superior intelligence, of deep penetration, or of keen genius; nor did any of that mild cast of countenance, or chastened resigned features, which sometimes distinguish the recluse, or devotee of every nation, appear here; neither severe, nor shy, their looks rather indicated a kind of apathy, or indifference.

The building had no decorations without; a close gallery ran round the body of it, to which only one door opened, that rendered it so close, for want of fresh air, with the strong fumes of the oil of several lamps burning, and the aromatic odour of yellow flowers, profusely scattered on a raised terrace before the idol, that it almost overcame me on entering the interior apartment. On our being introduced, a curtain which enclosed the shrine, was drawn back, and the figure of Boodhoo, of a gigantic size, reclining at full length on his side, was at once displayed. His head lay on a pillow supported by one hand, the other extended on his body; the habit was very simple, of a saffron colour, covering him from the neck to the heels, and the only decoration was a kind of plain belt across the body. This statue was about eighteen feet long, and well proportioned, but whether made of wood or of composition, I could not learn. The countenance was mild and full, and the top of the head painted to re-
present the hair in several small curls of a black colour. This was the grand idol of the place, but on approaching it, placed thus at full length on a raised terrace on which several lamps and a profusion of flowers were placed, no external signs of adoration or respect were shewn by the priests. In a corner of the room was a smaller figure represented sitting cross-legged on a coiled snake, the expanded head of which shaded him. From the same habit and the same round turn of feature, it was easy to see that Booshoo was also here represented. A female figure, the natural size, decently, and not ungracefully, arrayed in the same garb, was represented standing in another corner, and holding a lamp in the extended hand. In a third corner stood a male figure said to represent Vishnu: and in the fourth Rama Swamy, of a dark blue colour, and distinguished by his peculiar attributes of several hands and the correspondent Hindu ornaments of bracelets, rings, and chains. How a figure so totally different in its dress and ornaments came to be placed here, I was not, for want of an interpreter, able to learn. We may however conclude, that the votaries of Booshoo do not exclude the worship of the other Avatars. The gallery which ran round the inner apartment was entirely covered with paintings, in compartments rudely finished, each apparently containing the history of some event of the life of Booshoo: these, they told me, were also narrated in a great book always kept by the Moodelier of the place: one of these paintings seemed to represent the birth of the divine child; others represented his youthful adventures; some of which seemed a kin to the sportive Kishen's amusements on the plains of Muttra. In one, a youth held earnest converse with a nymph, among deep shades and woods, while a monkey, hid by the branches of a tree, seemed to listen with mischievous intent: in another, the God appeared as a youth flyly stealing and distributing handfuls of coin from a chest, towards which an aged man approached with cautious steps; holding a huge key in his hand: on
on others-processions appeared; feafts seemed prepar-
ed; food was distributed to the poor of various nations
(as appeared by their various habits); and the different
habits and manners of men in active life were pour-
trayed. A large white elephant made a conspicuous
figure in most of these assemblies. The style or costume
of these paintings was entirely different from that of
the Hindus on the peninsula, and plainly belonged to a
different people, though they undoubtedly shewed those
of the Cingalefe and the followers of Boodhoo. On
observing in these representations, chairs, tables, metal
lamps, and raised seats, such as are used by the present
race inhabiting the coast of the European part of Ceylon,
which I had at firft suppos’d they had borrowed from
their present masters, I reflected that these indicated a
connexion with the nations to the eastward which still
ufe them, and that cuftom fo widely different from that
of the Hindus, who always seat themselves on carpets, or
cloths spread on the ground, might have been import-
ed from China, Siam, or Pegu, with their other cuftoms
and religion.

Without the temple, but within the enclosure, was a
folid building, with a cupola figured roof: it had no
opening whatever; within it they told us Boodhoo
was interred, or rather the sacred elephant.

On my expressing a wish to be poiffeled of a book
containing the history and drawings of the deeds of
Boodhoo, the priests informed me, through a very in-
different interpreter, that it could not be copied off with-
in a fortnight, but they promised to have a drawing of the
principal figure ready on my return from Matura.

They were as good as their promise; for on my re-
turn on the evening of the 31ft March, they had ready
for me the outlines of the principal figure of Boodhoo,
(Plate No. 2,) with some account of it, in the Cingalefe
character.
Near a mile from Matura, we were shewn another temple of Boodhoo, in the deep recesses of woods and shrubs, the whole country being covered with them, and the habitations dispersed among these enclosed by gardens and little plantations. This temple, or rather house, was decorated in front with flowering trees and shrubs; among which was a clump of bamboos, remarkable for being of a bright yellow colour, with small stripes of green branching from below the joints. The priests, with much complaisance, permitted us to cut one as a specimen, and presented us with flowers, among which was the yellow Moogy. Within was an image of Boodhoo, and several other figures illuminated by lamps and enclosed by curtains, as at the other temples. In like manner the terrace or raised altar, was covered with flowers, and the walls with paintings. The dress of the priests was the same as already described, an orange or tawny-coloured cloth enveloped the body; the colour decaying turned to a kind of snuff colour.

We were conducted by a narrow stair-case to an upper-room, wherein was placed a painting of one of the figures below, (a female,) but we could not get a distinct account of it from want of an interpreter.

The head priests of these temples, we understand, were called Terrinanie. The inferior orders Ganinnanra.

Ruins of a Hindu temple (or Dewullum) on Dewunder-head, or Diví-nóor, (called in the charts Dunder-head) the Southerly point of Ceylon.

About three miles from Matura, the road passing along the sea-beach of the bay formed by the promontory to the east, we ascended a gentle declivity cloathed with woods of various kinds of trees, but chiefly the cocoa, and in about a mile's walk came to a Cingalese temple*

* Plate, No. 1.
A Cingalese Temple &c.

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of a circular shape, of about 160 feet in circumference and twelve high, forming a terrace, from the center of which rose a bell-shaped spire, crowned with a smaller cone, on a square pedestal, the height of the whole supposed to be thirty feet; a parapet ran round this terrace, to which a door and stair-case led up; and here, exposed to the open air, as we approached soon after sun-rise, we observed some Cingalescé men and women walking round, bending and inclined towards the spire, apparently praying: they retired before we ascended the steps. A small thatched hut disfigured a corner of the terrace, which seemed designed to lodge one of the priests who received us as usual with complaisance. No figures, inscriptions, nor any thing else remarkable, appeared, excepting a single granite pillar four feet high placed on end, perhaps intended to receive a lamp at night. This structure we were told was solid; it had no doors, windows, or any opening: they said one of the teeth of the sacred elephant was buried in it. It was, on a large scale, what the spire within the enclosure at Billigaam was in miniature, and seems to be the peculiar shape of a shrine or appendage of a temple of Boodhoo.

After a short view, we were conducted from thence to the sea-beach of Dewunder-head, scarcely 1400 yards distant, by a gradual descent along a walk or avenue in the woods; in walking over this ground, several remains of ancient buildings resembling the Carnatick temples struck us forcibly, and induced as narrow an inspection as could be made in a couple of hours.

Close to the beach we find the first avenue or building, probably designed for the use of the devotees, immediately before or after ablution in the sea, which is not above forty yards off; the descent over the bank is not difficult, though the coast below is lined with masses of granite washed by the waves. It consists of a colonnade of sixteen pillars of granite about nine feet high, the
the four center ones of which only are cut to regular form with bases and capitals: it exactly fronts the line of the avenue to the temple on the height: on its north side are two pillars* also sculptured, forming an exact square with the two central ones of the colonade, in the center of which is a square opening of about two and a half feet on the sides faced with stone but nearly filled up with earth; this seems to have been the situation of the interior recess where the object of worship was placed, of which and of the roof no vestige remains.

Proceeding thence by an easy ascent, we cross the ruins of a wall probably the enclosure of the grand temple, marked by several pillars and upright stones, but no sculptures are to be seen till we reach the Cingalesse temple, nearly fronting which stands the inner portal of a Hindu temple, consisting of two upright stones supporting a cross one, all carved on one face, with ornaments similar to those of the interior parts of the pagodas on the coast; the center of the cross stone occupied by a fierce fantastic head, the sides by a running border of foliage, and the basement supported by figures exactly in the same style and taste.

To the left of the Cingalesse building are more ruins, evidently the remains of other temples: the steps leading up to the raised floors of these are decorated with the heads of elephants, carved out of stones placed on either side; an ornament frequently to be observed in Hindu temples, as the entrances of Egyptian buildings were ornamented with those of the sphynx.

Near these we meet a deep well, across the mouth of which was placed a flat granite stone, with a perforation of six inches square through its center, between the figure of the prints of two feet raised on the stone: the figure

* Plate, No. 1.
gure occupying the rest of the stone is scooped out to the depth of two feet. It is probable this well was enclosed within some of the buildings now no longer existing; its use does not appear; the cross stone was too heavy to be easily moved, and occupies too much room to admit of water being drawn from it for any common use; the figures carved on it indicate some connexion with the Lingam and Phallus; and may furnish a key to the object of worship here.

On narrowly examining these remains, little doubt remained in my mind that this was the site of an ancient Hindu temple, on the ruins of which the Cingalese building was raised at a much later period. The revolutions of religion, in which the first was overturned and almost every vestige of its worship destroyed, to make room for the other, would, probably, be explained by the Cingalese history, an abstract of which is published in Valentyn's book, under the article Ceylon.

The name of the place Divi-n-oor-Dewalla, favours the opinion, and when we recollect the partiality of the Hindus to build their religious structures in places near the sea, to water, to the spring heads of rivers on the tops of remarkable hills, and mountains and situations favourable to retirement from the world, and to purer ablutions, according to their ideas; in places to which the extraordinary length and toil of the journey attached a superior degree of merit; as instanced in the pilgrimages to Jagarnat and Ramisur; to the wilds of Purwuttum; to Tripetty; to the sources of the Godavery at Trimbuck Nasser, and of the Kistna at Balisur; we need not be surprized to find a fame of Mahadeo reared on the utmost bounds of Lankadeep, and their habitable world; and shall be ready to suppose that the ablutions at the furthest point of Ramisur became the greatest extent of their pilgrimages only, when revolutions, of which we have yet no distinct accounts, and the introduction of
of a foreign religion and nation into Ceylon, rendered the pilgrimage to Devinoor no longer practicable.

We may then suppose that, previous to the introduction of the Cingalese language from the eastward, that of the Hindus in one of its dialects prevailed. Some of the Dutch now tell us, (as Baldeus did long ago) that the inhabitants of Ceylon from Chilaw north, and round to Batacaloa on the east, speak the Malabar (or Tamul); while the Cingalese to the southward, and the Candians, speak the language said to be derived from Siam. In examining many of the names of places throughout the island, we find many apparently derived from the Hindu languages; and judging by analogy, may infer that this was prior to the other, from giving names descriptive of certain qualities peculiar to those places; a rule as applicable in India, where the names of all the remarkable rivers, towns, and hills, are thus derived from a language descriptive of their qualities or history, as to the north and west of Europe, where the Celtic language is traced in the same manner; and particularly in our native islands of Britain, where the original inhabitants may be traced, from many of the names, after various revolutions and successive settlements of Romans, Saxons, Danes, Normans and Germans.

The head man of the village, a Cingalese, who could give no account of the origin of the ruins, proposed to conduct us to another to which we went by a path winding among the woods about three quarters of a mile distant, gradually ascending to the face of a rising ground, where we found a small pagoda or dewul, built of hewn stone, flat roofed, square, with one door and having no spire pillars or arches; it had no sculpture except some mouldings about the pediment cornices, and door; nor did any altar, image, or decoration appear to shew the object of worship; though from its exact likeness to the plain style of some of the small pagodas built of hewn stone in the Carnatick, there can be little doubt of its origin. The
The villager could give no other account of it than "that it was built by one Galgami, who dealt with evil spirits, by whose aid he reared these structures." Thus we find the origin of all works, beyond the reach of recent time, and vulgar knowledge, in every country attributed to some supernatural agency, from the rude and laborious structure of Stonehenge to those of Elora (Elloor), and the more diminutive one of Galgami.

Though the figure of the Lingam, cow, and every object of Hindu veneration, seems purposely removed, enough remains, in the simplicity of the style of the architecture and its few decorations, to ascertain its claim to antiquity; and this shews the use of classing the objects of this kind we frequently meet dispersed over India. In the more modern religious structures of India (I allude more particularly to those of the Carnatick upper and lower, the architecture of which is very different from that used in the north-west parts of the Dekan*), we find a novel style more complicated and certainly more contrary to good taste. These buildings and their cover-ums or spires are crowded with an immense number of small pillars, pilasters, cornices; and the numerous and ill distributed compartments filled with monstrous, dis-proportioned, figures of the deities, or rather their attributes, which disfigure them and make a strange impression at first sight on Europeans accustomed to form their ideas of the beauties of architecture by classical rules drawn from the Grecians.

The more modern Hindu buildings are further distinguished by being generally built of brick, excepting some of the greatest, as Canjeeveram, Madura, Seringa, Ramis-sur; which from their style are supposed not to be of the more ancient. The more ancient† temples are not covered

* A comparative view of the different styles of the architecture of these buildings in the Carnatick upper and lower, and in the north west parts of the Dekan would be curious.
† The gradations in their style may be traced from the small pyramidal structures of not above six feet high, to the first exhibitions of the figure
vered with the monstrous figures above alluded to; they are generally plain; or at most exhibit a few groups representing some remarkable parts of the history of the god worshipped; such as the adventures of Krishna, his escape when an infant, his sporting amusements among the Gopias, or the churning of the ocean by the Dewatas and Asfoors; which seem rather designed to convey some moral, than as immediate objects of worship: from whence we may suspect that as in latter times the ancient simplicity of their religion was debased and corrupted, the custom of covering their walls with these monstrous figures with many arms and heads was by degrees introduced: and this furnishes data for forming rules by which perhaps the antiquity of these buildings could be ascertained, by a comparison of the different styles; when written evidence (as found in the copper plates at Conjeveram, translated in the third volume of the Asiatick Researches, and may perhaps be found if the plates at Purwuttum were translated) is wanting.

These might assist, with the extensive knowledge obtained of late of Hindu literature, in illustrating the more ancient part of the history of this nation, and ascertaining the justice of their claim to a knowledge of the arts and sciences through a remote antiquity; at least their gradual advances in the arts might be traced from the first rude attempts; and new light thrown on the history of mankind in its early stages.

ANCIENT INSCRIPTION ON A ROCK AT DEOGAMME, NEAR CALITURE.

On my way back from Pointe du Galle to Colombo I had intimation from the Dutch clergyman of Caliture, figure of Mahadeo, under the semblance of a rough stone, not unfrequently seen under trees in the open air. The figure of Hanamunt, the protector of travellers, the companion and assistant of Rama in his famous expedition to Lanka may be seen, cut in relievo on upright stones placed on the roads, and near the villages, throughout the Carnatick.
a post twenty-five miles south of Colombo, of an inscription cut upon a rock within a few miles of that neighbourhood; and being desirous of seeing it, a party was made up to accompany me on the next morning to go by the river as far as a sugar plantation lately laid out by a society of gentlemen.

We embarked at day break in a small boat on the river Caligonga, which is wide and deep, and its banks on either side lined thick with woods and bushes close to the water's-edge, which renders the landing difficult: the stream was placid, the tide in our favour, and we were soon rowed about three miles to the landing place, whence we crossed the newly-cultivated ground, to the plantation, house, and mill, about half a mile further. The country, where cleared, appeared through the openings of the woods beautifully swelling into small eminences, clothed with various kinds of timber, among which the jack tree of a great size, and cocoa trees of different kinds predominated: the air was perfumed by the betel and various trees in flower, and a variety of flowering shrubs, which diffused a grateful fragrance all round. After leaving the sandy coast, the soil was reddish, particularly of the rising grounds; excepting the sugar canes of the plantation and some rice cultivated in part of the lower ground, no other cultivation was observable; but the country, if once cleared in a greater measure, promises to be highly productive. A road appeared to have been recently made leading out to the eastward towards Candia, as we were informed, but no towns or collected groups of houses appeared, though from the number of inhabitants we met, their habitations could not be far distant. A small neat house is built on the plantation for the use of the overseer, and the mill built near it, where the operation of bruising the cane is performed by three cylinders of granite placed vertically on a platform, worked by oxen placed below.
From hence we were conducted through woods and cocoa plantations to a temple of Booodhoo. It was built on a flat space, cut out of the side of one of the swelling eminences, and had nothing remarkable in the style of building, being a square house, with a tiled sloping roof, and a gallery running round it, also covered with a sloping roof; but considerably lower than that in the centre, so that this double story of sloping roofs, gives it the air of those we meet with in Chinese paintings. In the interior apartment (the curtain which enclosed it being withdrawn) the image of Booodhoo was seen, reclining in the same attitude as at Biligam, but not of such a size; illuminated by lamps, and strongly perfumed with flowers and odours. The walls were covered with paintings, as usual, representing his history: and several commodious houses were built near it for the priests. I was disappointed in my hopes of obtaining here some further lights on the inscription, and an image reported to be sculptured on the rocks; and my companions being deterred by the increasing heat of the day, I proceeded in quest of the place, attended only by a countryman who undertook to shew me the way. After walking smartly for an hour and a half through the woods, but out of sight of the river, we came at nine o'clock to a huge block of stone in the channel about fifty yards from the banks, and surrounded by water, but nothing like an inscription appeared on the side next it. The villagers whose habitations were scattered in the woods, near the place, finding what I was in quest of, carried me back to a field, where was another large block of the same kind of stone of a black colour, probably from long exposure to the air, and rude without any appearance of art: the higher part of it was about fourteen feet high, and on a low projection of about twenty feet from this, the villagers shewed me the vestiges of characters, rudely carved of unequal sizes; they were however so corroded by time and the effects of the air, that I should have found considerable difficulty in making them out, had
it not been suggested that some chunam or lime water, traced on the hollow characters indented in the rock, would render them legible on the dark ground of the stone; by tracing them in this manner, I was enabled to sketch off the appearance of the whole with, I think, tolerable exactness; and the annexed drawing copied exactly from the tracing taken on the spot, represents this inscription*. Of the causes of engraving it here, or the history of the place I could get no satisfactory account from the natives, except some incoherent traditions of its being formerly struck by lightning, whence it is called Pelnucallu or split stone. The place is also called Deo Gamme.

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**NOTE.**

A FURTHER paper on the island of Ceylon, and the worship of Boodh or Buddha, has been communicated to the Society by Lieut. Mahony, who was for some time resident on the island, and procured an extract from the Maha Raja Wallileh, also called the Raja Wully Putter, an historical work, which traces back the introduction of the religion of Buddha to the Prince Vijeerajah and his followers, who came to the island in a ship from the eastward, in the sixth century before the Christian era; about which period it is also to have been introduced in Siam. It is indeed the period at which Goutama Buddha (the Buddha now worshipped) is supposed by the Singalesse to have made his appearance on earth: the epoch of his disappearance, which constitutes their sacred era, being five hundred and forty-two years before the birth of Christ, corresponding, within two years, to the same era in Siam, as stated in Mr. Marsden's tract on Hindu chronology.

* Plate, No. 2.

Mr.
Mr. Mahony’s paper, which could not be inserted in the present volume of the Society’s researches, will appear in the next: accompanied by some remarks from Mr. Harington, who was at Colombo in the year 1797; and has subjoined the following hastily descriptions, written on the spot, of two temples of Buddha; one situated at Calanee, near Colombo; the other near Caliture and mentioned in the concluding paragraph of Captain Mackenzie’s paper.

**TEMPLE AT CALANEE.**

- February 7, 1797.—Visited a temple of Buddha at Calanee, about six miles north east from Colombo. The images are of stone, nearly the same as that at Boodh Gya*, viz. A man in a fitting posture, the right leg supporting the left, and the right hand supporting the left hand. The right arm and breast uncovered; the left side and the waist covered with a folding vest, the end of which hangs down before. The complexion fair, but no conclusion can be drawn from this, or from the features, as two images in the two temples at this place differ considerably in these respects; one is a fair round face, the other darker and more oval. Both agree in long pendent ear rings, and crisped hair; but instead of a knot of the latter, as apparently represented on the image at Boodh Gya, the heads of all the figures of Boodh at Calanee are crowned with a sort of tiara, somewhat resembling a hand; or rather five fingers joined to each other, (called Seerafooter). In one of the temples three images of the above description were enclosed in a glass case, which the Gonni, or officiating priest, readily opened to satisfy my curiosity, and allowed me to approach as near as I wished, without even desiring me to take off my shoes as usually required in other parts of India. Before the case, which stood on the north side of the temple, and extended the whole length of it, was a

*A place near Gya, in the province of Bobar, where there is a temple of Boodh; as there also has been at And-eoffice near Benares. wooden*
wooden table, on which oblations are made at noon. These usually consist of flowers, fruits, or money; no animals being here sacrificed. The lotos, from surrounding representations of devotees, appears to be the favourite flower of the god, and I also observed the Keyora and Gool-acheen, two of the most fragrant flowers in India. Images of Booodh, and other figures, among which HoneeMan, Brama, and Vishnu were pointed out to me, are painted on the walls and roof of this temple, but chiefly Booodh, in different postures, sitting or sleeping, and his devotees bearing each a Nagisur flower; with sixteen representations of Dagbopes (hereafter mentioned) which are said to represent the sixteen temples or rather monuments of this description on the island of Ceylon. The idol temple I am now describing is called a Veehar (or college), and consists of one small apartment, of an oblong square, composed of common brick and mortar materials with a tiled roof. It is said to have been built time out of mind, but from its structure cannot be ancient. I saw nothing peculiar in its exterior, and have nothing further to remark on its interior, but that it contained a lamp said to be kept always burning, and a curtain occasionally drawn across the middle of the apartment to keep the sanctum from the eyes of the profane. On each side of the door way, enclosed in receptacles cut into the wall, are too large figures, the janitors of the god, and others are sculptured round bearing a club, and covered with a high tiara. In the passage which leads from the first temple (above described) to a second of the same construction are two other large figures cut in alto relief, representing two attendants on the local deity. The second temple contains a single figure of Booodh, resembling the figures in the other temple with the differences already noticed, and somewhat larger, being I suppose six feet high in the sitting posture, whereas the first could not be above five feet; or perhaps four and five feet may be nearer the exact height of the two. A large elephant's tooth, given by the king of Candia, is fixed in the ground near this image, and a small ele-
phant of brass, with a driver of the same metal, forms
the ornament of a lampstand; the light of which was
extinguished; nor was any other light burning in this
temple.

Both the above Veebars stand on an eminence, sur-
rounded by cocoa-nut and other trees, and by a low
wall, which likewise encloses a third building to the
north of the others, called Daghope, with the addition
wahunsee. This building is a solid mass of earth and
brick-work, of a considerable height, perhaps sixty feet,
and shaped somewhat like a dome with a cupola above.
This monumental temple is said to contain twenty ima-
ges of Booodha buried below it. The inside is a mound
of earth; the outside a covering of no great thickness of
brick, which has been damaged and partly destroyed by
the rain. At the foot of the eminence is the house of
the priests, five in number, who have been appointed to
officiate at the ceremonies performed at this place dai-
ly at noon, and annually at the principal festival in By-
saak; when great numbers of pilgrims are said to assem-
ble here. The priests are called Gomni, and if learned
men, Taranashi. Rakhita Booodha, and Ghose Booodda, who attended me, were neither of them
Brahmins, nor, as far as I can understand, are there any
Brahmins on the island*. They were both as civil and
attentive to me as men could be, and after presenting
me with cocoa-nut and plantains, would not allow me
to pay for them, or to give them a present, although
they had permitted me, without objection, to make a
pecuniary offering to their god.

TEMPLE AT OOGULBODDA.

March 10th.—Visited Oogulbodda Veebar, two cols
east of Calititure. The temple is a tile-roof building,

* There probably are, however, at Candia, where there are Hindu
temples: the present king, who came from Tinewelly in the Carnatick,
being of the Hindu religion; whilst the bulk of his subjects are worship-
pers of Booodha.
TAPUS in the TEMPLE of OOGILBODDA.
an oblong square, with a veranda, supported by square-brick pillars, and covered with leaves of the coconut tree. Situated on an eminence and surrounded by trees. Near it, on the east side, is a triple-rooted building, called Beinamadoo, in form like a pigeon-house and covered with Cajans, in which the precepts of BUDDHA are read to his votaries at festivals and other times of assemblage. No Daghope*. The former Veebar at this place was destroyed by the Portuguese, and the present erected by Dicumber Siddart BUDDHA, the old priest who now superintends it, about forty years ago. This Veebar, besides two large figures of Janitors at the entrance, and various paintings on the wall within the veranda, historical and mythological, contains a colossal image of BUDDHA, eighteen cubits in length, composed of earth and cement, in a sleeping posture; or rather reclining on his lotus throne; his head resting on a pillow, and supported by the right arm, whilst the left is extended on the thigh of the same side. He has the same tiara, ear-rings, and curled hair, as all the other images I have seen, and, with no unpleasing aspect, is painted of an azure brown complexion; whilst other images in the same temple are of a dulky yellow colour. His mantle, which nearly covers him (the right breast only excepted) is yellow, the general colour of the Sewara, though on one of the images in this temple it is a dark orange, approaching to red. Before this figure is the principal altar; and, besides flowers of several kinds, there were upon it above a dozen small brass figures of the god, (one of which the priest gave me†, at my particular desire, after having presented my offering; though not without an evident struggle with his feelings, which

* The solid monumental building before mentioned, and represented in the Plate, No. 1, accompanying Captain Mackenzie's paper. Its deficiency at the temple of BUDDHA here described is singular; as it appears a general appendage to a Veebar. Whether it has any connexion with the pyramids of Egypt we yet want evidence to determine.

† The fitting figure in the accompanying Plate, No. 2.
were overcome by the persuasions of the other priests present) a brass inkstand, with some images on it; and a covered Carandu; (or miniature Daghope;) at least said to be such; though from whisperings, and the explanation given me that it was of brass, and therefore not proper to be exposed, left it should lessen the veneration of the votaries, I suspect it was not exactly what it was pretended to be.

The above-described colossal image, lying in a north and south position, occupies the whole of the west side of the temple. At the north end is another image of Buddha, in a sitting posture, nearly the same as at Calanee, but surrounded with more ornaments; having on each side two tygers or leopards, with two alligators: and, over the head, a fabulous animal called kimis, with three large teeth in front and two on each side of the mouth. These ornamental figures, I was informed, have no connexion with the character or history of Buddha; and should have been placed on the outside of the temple, had there been room. Two figures on each side of this image, with chowries in their hands, were stated to be Vishnu, in attendance upon Buddha: but I have some doubt of the accuracy of this information, as at the south end of the temple, where there is a third image of Buddha in a standing posture, there is likewise an image, evidently of Vishnu, of black hue, and crowned with a high tiara, which bears no emblem of attendance or service; though the priests, whilst they acknowledged him to be a Devyo, declared him to be inferior to Buddha, and placed in his temple as one of his attendant worshippers. There are several other images of Buddha in this temple, which, having no peculiar characteristic, do not call for distinct notice. It may be of use to observe, however, that on my pointing out the uniformity of the head-dress, in respect to the crisped hair; and asking whether it was meant to represent the hair of an Abyssinian; the priests, of whom four were present, answered
served in the negative, with apparent abhorrence; and the priest who had before attended me, repeating his previous information of Buddha's being the son of Sudodhana rajah, and born in Muggud deihi (Bahar), added, in explanation of the hair being short and crisped, that Buddha had on a certain occasion cut his hair with a golden sword, and its appearance in consequence was meant to be represented on his images. I recollect nothing further of consequence observed by me (not an hour since) in this temple, except that several lamps were burning, which are said to be perpetually kept lighted (though of this I have some reason to doubt), and that the ceiling was covered with ill-executed paintings of the lotos; whilst on the walls, besides a flower resembling the Nagisur (if not the same,) the Keyora, of the species which contains the greatest quantity of fragrant dust, appeared the chief votary of the vegetable tribe.

After writing the foregoing, and conversing through an interpreter with the four priests on the difference between a Gomnasha and Taranasby; the manner of elevating these under-graduates and doctors; and the mode of abdication when a desire of marriage, infirmity, or other cause requires it; the nature of Buddha's doctrines as to a future state, and the creation of the universe (on the former of which important subjects he has spoken with more certainty than on the latter); and lastly on the daily worship of Buddha and his festivals; to shew me the usual ceremonials, although it was now neither morning, noon, or evening, the three appointed times of daily devotion, they most cheerfully offered to conduct me again to the temple, and after a few preparations, to satisfy my curiosity on this head; apologizing at the same time they had not the means of doing so, as I could be gratified at Candy, where numerous musical instruments are used in the Poojah; and particularly on grand occasions, as the festival of the birth and death of Buddha on the 15th Vyasaak; the Katick Poojah.
poorajh on the 15th Eel; the harvest feast in the month
Doorootoo; and other festivals, of which they stated the
entire number to be forty eight, viz. on the 8th, 15th,
23d, and 30th days of each lunar month, or rather on
the new and full moon, and first and last quarters of
each month.
XII.

ON MOUNT CAUCASUS.

BY CAPTAIN FRANCIS WILFORD.

This appellation, at least in its present state, is not Sanscrit; and as it is not of Grecian origin, it is probable, that the Greeks received it through their intercourse with the Persians. In this supposition, the real name of this famous mountain should be Caus or Cas; for Cau or Cob, in Persian, signifies a mountain. Now, if we translate this appellation of Cob-cas into Sanscrit, we shall have Cas giri; or according to the idiom of the spoken dialects, Cas-ghar or Cas-car; and, really, such is the present name of the mountainous region, in which Ptolemy afferts, that the Caucasus, properly so called, was situated. This country, which very much resembles the valleys of Cashmir, and Népál, is mentioned in the Ayeen Akbery; and was surveyed a few years ago by my friend Mirza-Mogul Beg. It must not, however, be confounded with the famous country of Cash-ghar, or Cash-car to the eastward of Samarcand; though the appellation and its etymological derivation be the same.

The true Sanscrit name of this mountain is Chasa-giri, or the mountain of the Chasäs, a most ancient and powerful tribe: who inhabited this immense range, from the eastern limits of India to the confines of Persia; and most probably as far as the Euxine and Mediterranean seas. They are often mentioned in the sacred books of the Hindus.
Their descendants still inhabit the same regions, and are called to this day C'hasas, and in some places, C'hasjas and Coffais. They belonged to the class of warriors, or C'bettris; but now they are considered as the lowest of the four classes; and were thus degraded, according to the institutes of Menu*, by their omission of the holy rites, and by seeing no Brahmins. However, the vakeel of the rajah of Comanh, or Almora, who is a learned Pandit, informs me, that the greatest part of the zamindars of that country are C'hasas; and that they are not considered, or treated, as outcasts. They are certainly a very ancient tribe; for they are mentioned as such, in the institutes of Menu; and their great ancestor C'hasa or C'hasya is mentioned by Sanchoniaton, under the name of Cassius. He is supposed to have lived before the flood, and to have given his name to the mountains he seized upon. The two countries of Cashghar, those of Cash-mir, Castwar, and the famous peak of Cashghar, are acknowledged in India to derive their names from the C'hasas. The country, called Coffa by Ptolemy, is still inhabited by C'hasjas; and Pliny informs us† that the inhabitants of the mountainous region, between the Indus and the Jumna, were called Cesi, a word obviously derived from C'hasa, or Chésai, as they are often denominated in the vulgar dialects.

The appellation of Caucasus, or Cob-cas, extended from India to the shores of the Mediterranean and Euxine seas; most probably, because this extensive range was inhabited by C'hasas. Certain it is, that the mountains of Persia were inhabited by a race of people called Cofsei, Coffsei and Cissii; there was mount Cofius on the borders of Egypt, and another in Syria; the Caspian sea, and the adjacent mountains, were most probably denominated from them Jupiter Cassius, like Jupiter Peninus in the Alps, was worshipped in the mountains of Syria, and on the borders of Egypt: in the

* P. 294. † Pliny B. 6, c. 20. Cesi montani, &c.
Epirus we find, that the titles of Cælius and Cæsiopeus, given to Jupiter, were synonymous, or nearly so. In Sanscrit the words C'hafapa, C'hafyapa and C'hasyapati, signify the lord and sovereign ruler of the C'hayas: C'hafyapéya or C'hasapéya, in a derivative form, implies the country of C'hafapa.

The original country of the C'hafas seems to have been the present country of Cachgar, to the north-east of Cabul; for the C'hafas, in the institutions of Menu, are mentioned with the Daradas, who are obviously the Darade of Ptolemy, whose country, now called Darad by the natives, and Darwurd by Persian authors, is to the north-west of Casmir; and extends towards the Indus: hence Ptolemy, with great propriety, afferts, that the mountains to the north-east of Cabul are the real Caucasus.

The country of Cachcar is situated in a beautiful valley, watered by a large river, which, after passing close to Chagá Seray, Cooner and Noorgul*, joins the Landi-Sindh, or little Sindh, below Jalálabád, in the small district of Cameb (for there is no town of that name), and from this circumstance the little Sindh is often called the river Cameb.

The capital city of Cachcar is called Chatraul, or Chatraur, and is the place of residence of a petty Mahomedan prince, who is in great measure tributary to the emperor of China; for the Chinese are now in possession of Badaçshán as far as Baglán to the north-west of Andéráb. The Badaçshánát, or districts composing the province of Badaçshán (for Badaçshánát is the plural form) are separated from Cachcar to the south-east by a high range of mountains, always covered with snow; and the road from the new capital of Badaçshán, called Faiázálabád, and Faiziyu 'ábád, near the site of the old one, is through

* Cooner and Noorgul are called Gá-noorgul in the Ayeen Akbery.
Caficar is also called Cazhtwar, which denomination is generally distorted into Ketwer and Cattore by Persian authors and travellers. The town and district of Ketwer, mentioned in the life of Amir-Timur, is different from this, and lies about fifteen miles to the north-west of Chágá-Serai, on a pretty large river, which comes from Váhi-gálamb: it is generally pronounced Catowr. Pliny informs us* that mount Caucæus was also called Graucæus; this appellation is obviously Sanscrit; for Grdva, which in conversation, as well as in the spoken dialects, is invariably pronounced Grau, signifies a mountain, and being a monosyllable (the final being furd) according to the rules of grammar, it is to be prefixed thus, Gráva-Ch'hafa, or Grau-Ch'hafa.

Isidorus† says, that Caucæus, in the eastern languages, signifies white; and that a mountain, close to it, is called Cas by the Scythians, in whose language it signifies snow and whiteness. The Cas is of Isidorus is obviously the Casian ridge of Ptolemy; where the genuine appellation appears stript of its adjunct. In the language of the Cilmack Tartars, Tósu and Cháfsu signify snow; and in some dialects of the same tongue, towards Badacshán, they say Tushá and Chushá. Tushá and Tuchá or Tuca. These words, in the opinion of my learned friends here, are obviously derived from the Sanscrit Tushára, by dropping the final ra: this is often done in the vulgar dialects: in the same manner we say whale, leg, calf, &c, for whalur, legr, and calfr, which prevailed, it seems, in the ancient Gothic language. The words Chafa or C'hafa are pronounced Ch'afa or Cas; Chusa or Cufa, by the inhabitants of the countries between Bahlac and the Indus; for they invariably substitute ch or c in the room of sh. Thus they say C'hehr for Shehr, which in Persian signifies a town, &c, but the words Ch'afa or Cas never signified white, or whiteness, unless by implication: and this is in some measure confirmed by Pliny, who seems to hint,


that
that the word Graucus signified snow-white. Ptolemy places mount Casis, or Casis, in a country called A'chásfá, which was situated between Ládác and Yárc'bhand. The word Aé signifies white, and Cárá black, in the Turkish language, which is used in the country about Samarcand, and both are obviously derived from the Sanscrit Aeb'bh and Cálá. The word Aéchásfá is corrupted from Aeh'b-Chásfá, and in the vulgar dialect of that country A'c-chásfá, the white C'hásfás; because the inhabitants of that country are C'hásfás, and are remarkably fair; whilst the southern C'hásfás are of a darker complexion. According to the report of respectable merchants, who constantly travel from Casmir, Nurpoor, &c. to Yárc'bhand, the inhabitants of the countries, situated between Ládác and Yárc'bhand, use the words A'e and Cárá, till within a few days of Yárc'bhand, where the Cálmák dialect prevails.

The general rendezvous of these merchants, since the time of Sha'H-Je'Hán, is at Ládác; from which they proceed in a body to the place of their destination, travelling, the greatest part of the way, along the Indus: for this famous river has its source in the mountains to the north-west of Yárc'bhand, at the distance of about four or five days journey. Then taking a southerly direction, it comes within two days of Ládác, where suddenly turning to the west, it takes an immense sweep towards Saighbur, probably the Sheker of the maps; and thence alters its course toward the confines of India.

The denomination of C'hásfá-giri or C'hásfá-ghar is now confined to a few spots; and is never used in any Sanskrit book, at least that ever came to my knowledge. This immense range is constantly called in Sanskrit Himáchel, or snowy mountain; and Himálaya, or the abode of snow. From Hima, the Greeks made Imaus: Emodus seems to be derived from Himoda, or snowy: Himána, Haimána and Haimánas, which are appellations of the same import, are also found in the Puránas: from these is probably deriv-
ed Amanus, which is the name of a famous mountain in the lesser Asia, and is certainly part of the Himá-laya mountains; which, according to the Puránas, extend from sea to sea. The western part of this range was called Taurus; and Strabo* says, that mount Imaus was called also Taurus. The etymology of this last appellation is rather obscure; but since the Bráhmens insist that Tuc'bárestán is corrupted from Tushára-sthán, by which appellation that country is distinguished in the Puránas; and that Turán is derived from Tushárán, its Sanskrit name, the sth being quiescent; may we not equally suppose, that Taurus is derived from Tushára or Tusháras: for this last form is used also, but only in declensions for the sake of derivation. Tushára signifies snow; Tushára-sthán or Tuc'báras-sthán, the place or abode of snow, and Tushárán in a derivative form, the country of snow.

Strabo and Arrian were certainly mistaken, when they supposed, that the followers of Alexander, in order to flatter his vanity, had given out, that the mountains to the north and north-west of Cabul, were the real Caucasus. The information the Greeks received about it was true and accurate: they were undoubtedly careless in their inquiries; but I can aver, that all the names of places in Alexander's march, from Báblac or Bálk to Multan, (where my friend Mogul Beg's survey ended), are either pure Sanskrit, or analogous to the idiom of the dialects used in the countries he conquered. The most questionable names, according to the learned, are Nicaea and Dédala: the first is a true and accurate translation of the Sanskrit Jayini-devá sthán, or the place of the goddess of victory, who is worshipped under that name at Cabul to this day. Numerous are the legends in the Puránas, relating to this place; which is called Asa-vana, and in the spoken dialects Asbáná. There are two places of that name.

* Strabo, B. xi. p. 519.
one called the lower; and the other Urdb-A'fbdná, or A'fbdná the upper: from this last the Greeks made Orthospána.

As to Daedala, it is no uncommon appellation in India, several places are called Daidavél, Dudbéwéla or Dudhaw-li, and Dundoýáli: the town of Daedala, with the adjacent mountains, are called to this day Dundoýáli; but more commonly Tauk-dundo or Dundo the cold, being situate on a high mountain.

An extensive branch of the Caucasus was called by the Greeks Parapamisus: it is a part of the mountainous region called Dévanica in the Puránas. I believe, there is no general name at present for the whole range: but that part, which lies between Cabul, Bámýyan, and Anderáb, is called Hindu-cašh and Hindu kešh; which last denomination has been distorted by Persian authors, and travellers into Hindu-Coh: at least in the opinion of the natives. Whether the appellation of Hindu-Cašh has any affinity with the C'hasus, I cannot determine: but the inhabitants say, that this name was given to them, from a certain giant, who used to lie there in wait, to catch (cašh), or to kill (kešh), all the Hindus, who passed that way. We find it called also Sheybar-Tág, or Sheybar-Tau, or the mountains of Sheybar or Shabar, under which appellation Prometheus is generally known in the sacred books of the Hindus. Be this as it may, the Greeks called it also Parapamisus, in the same manner, I suppose, that they called the river Pamisus, (in the Peloponesus) Pamisus.

The name of this famous mountain is variously written in different authors and manuscripts—

Parapamisus, Parapamisus,
Paropamisus, Paropamisus,
Parpamisus, Parpamisus,
Paro Fanisus, Paro Fanisus, Paro Fanisus, Paro Fanisus.
Parpameus, Parpemeus, Parpameus, Parpameus.

Parapamisus or Parapameus appears to be a compound; the first part, I conceived at first, to be the word Pahár, which, in the spoken dialects of India, signifies a mountain. In this supposition, the whole compound, stripped of its Greek termination, would signify the mountains of Vámí, or Bámí, commonly called Bámíyan, a famous city situated in the centre of this hilly country. Unfortunately the word Pahár, which is not of Sanscrit origin, is a disyllable; and moreover the second syllable being long, and marked with a strong accent, it cannot of course be prefixed. Besides, the word Pahár is never used in that country; but they say Ghar above Déra-Ismail; and Rob below it, amongst the Baloches. Rob is a Tartarian word, and indeed the Baloches seem to be the remains of some colony of Tartarian origin; it was originally the same with Oros in Greek.

The word Pahár is sometimes prefixed: but then it is in another sense; as for instance, Pahár-pur (literally Hill-burgh) signifies a town situated on, or near, a mountain.

The word Parapamisus, or Para Fanisus, is obviously derived from the Sanscrit Para-Vámí, or the pure and excellent city of Vámí, commonly called Bámíyan. It is called in Sanscrit Vámí nagari, Vámí-grán, and in a derivative form Vámíyan, or the most beautiful and excellent city. It is a place of great antiquity; and was considered at a very early period, as the metropolis of the sect of Buddha; hence it was called emphatically Buddha-Bámíyan; but the Muslims have maliciously distorted this venerable title, into Bát-Bámíyan or Bámian of the evil spirit, or of the idols. Para, which signifies pure and holy, is also one of the thousand names of Vishnu. Para or Paras is obviously the same with the Latin purus; for the letter a here sounds exactly like u in murmur in English. Para or Paras is for the masculine,
masculine, Parā for the feminine, and Param for the neuter genders.

Bāmiyan is represented in the books of the Baudhāyans, as the source of holiness and purity. It is also called Sharma-Bāmiyan or Sham-Bāmiyan; for in Sanskrit, Sharma and Shama are synonymous. This is also one of the thousand names of Vishnu, and of the famous patriarch Shem; by whom, according to the Baudhāyans, Bāmiyan was built. They say, that he was an incarnation of Jīna or Vishnu, and the Brāhmins in general are of that opinion.

This famous city, the Thebes of the east, being hardly known in Europe, I beg leave to lay before the Society a short description of it, with an abstract of its history.

It is situated on the road between Bābлае and Cābul, and they reckon eight manzils or days' journey from Cābul to Bāmiyan. From Cābul to Carabaug, there are four manzils N. N. W: from Carabaug to the pass of Sheybar, two manzils, inclining a little more to the west; hence to the fort of Zohauk one manzil, course north-west from Zohauk to Bāmiyan one manzil. Like Thebes in Egypt, it is entirely cut out of an insulated mountain: the valley round it is called, in the language of the country, the Tāgāvi of Bāmiyan. In this mountainous country, where the valleys alone are inhabited, the word Tāgāvi is become synonymous with Purgana or district. To the south of it, or nearly so, at the distance of about two miles are the ruins of an ancient city, called Ghulghuleh, which, according to tradition, was destroyed at a very early period by the Muslims. There are the ruins of several buildings of masonry round a small conical hill, on the summit of which are the remains of the palace of its ancient kings. A rivulet, rising in the adjacent hills, goes through the ruins of Ghulghuleh and the Tāgāvi of Bāmiyan, and falls into
into a small lake, from which issue four rivers, the Hirmend, the Landbi-Sindh, the rivers of Báblac, and of Conduz.

The city of Bámiyan consists of a vast number of apartments, and recesses, cut out of the rock; some of which, on account of their extraordinary dimensions, are supposed to have been temples. They are called Samach' hô, in the language of the country, and Samaj in Persian. There are no pillars to be seen in any of them, according to the information I have received from travellers, who had visited them. Some of them are adorned with niches and carved work; and there are to be seen the remains of some figures in relief, which were destroyed or miferably disfigured by Musulmans. Some remains of paintings on the walls are still to be seen in some of them: but the smoke, from the fires made there by the inhabitants, has almost obliterated them. It is said in the Ayeen-Akber, that there are about 12,000 of these recesses, in the Timán or Tagávi of Bámiyan; this is also confirmed, from general report, by travellers. The country of the Afghans, as far as Báblac and Badacshán, abounds with Samach'hes or Samajes: some of them are very rude, whilst others are highly finished and ornamented. The most perfect are at a place called Móbi, on the road between Bámiyan and Báblac: as they are situated amongst precipices, the Musulmans have never thought of living in them, and the paintings, with which they are adorned, look quite fresh.

But what never fails to attract the notice of travellers, are two colossal statues, which are seen at a great distance. They are erect, and adhere to the mountain, from which they were cut out. They are in a sort of niches, the depth of which, is equal to the thickness of the statues. It is said,

* This word is spelt Samach' hô by the natives.
in the *Ayyen-Akbery*, that the largest is eighty ells high, and the other only fifty. These dimensions are greatly exaggerated, according to the opinion of all the travellers I have seen, and the disproportion is not so great between the two. According to the author of the *Pharangh-Jehanghiri* cited by Th. *Hyde* they are said to be only fifty cubits high; which appears to be the true dimensions. At some distance from these two statues, is another of a smaller size, being about fifteen cubits high. Natives and *Persian* authors, who have mentioned them, agree neither about their sex nor their names. The few *Hindus*, who live in these countries, say, that they represent *Bhim* and his consort: the followers of *Buddha*, that they are the statues of *Sha'ha'ma*, and his disciple *Sa'lsa'la*. The *Musulmans* insist, that they are the statues of *Key-Umursii* and his consort, that is to say, *Adam* and *Eve*; and that the third is intended for *Seish* or *Seth* their son; whose tomb, or at least the place where it stood formerly, is shown near *Bablac*. This is in some measure confirmed by the author of the *Pharangh-Jehanghiri*, who says, that these statues existed in the time of *Noah*; though he gives them different names, and supposes the third to represent an old woman, called *Nesr*, more generally represented with the countenance of a vulture. These statues are so much defaced, through the injury of all-devouring time, and the intolerant zeal of the *Musulmans*, that I believe it is difficult to ascertain their sex. Travellers do, however, agree that one of them at least is a beardless youth; some more particularly insist that the swelling of the breasts is remarkably obvious, and that both look towards the east, so that, when the sun rises, they seem to smile, but look gloomy in the evening. Their dress, as described to me, is much the same with that of the two figures, half buried at *Tufl-Rustum* near *Istacar* in *Persia*; with this difference, that the female figure has no head-dress; but the male has such a *tiara* as is worn by the supposed female figure at *Tufl Rustum*.

* P. 132.

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These statues were visited, at least ten or twelve different times, by a famous traveller, called Me'yan-Asod-Shah, who is a man highly respected, both on account of his descent from Mohammed, and his personal character. He is well informed, in affluent circumstances, through the piety of the faithful, and keeps company with the princes of the country and persons of the first rank. He informed me lately, that these two statues are in two different niches, and about forty paces distant from each other. That the drapery is covered with embroidery and figured work; which formerly was painted of different colours; traces of which are still visible. That one seems to have been painted of a red colour: and the other, either retains the original colour of the stone, or was painted grey. That one certainly represents a female, from the beauty and smoothness of her features, and the swelling of her breasts: the head being so much elevated is secure from insult below, and is also protected from the weather by the projection above. The statue of their supposed son is nearly half a mile distant, and about twenty feet high. One of the legs of the male figure is much broken: for the Musulmans never march that way with cannon without firing two or three shots at them: but from their want of skill, they seldom do much mischief. Aurangzebe, it is said, in his expedition to Bâbâlac, in the year 1646, passed that way and ordered as usual a few shots to be fired; one of them took place, and almost broke its leg, which bled copiously. This, and some frightful dreams, made him desist, and the clotted blood it is said adheres to the wound, to this day. The miracle is equally believed by the Hindus, and Musulmans: the former attribute it to the superior power of the deity; and the latter to witchcraft. According to Dr. Hyde, one of these statues is called Surkh-But, or the red idol; the other Khink-But, or the grey idol. As to their being hollow, I believe, it is an idle tale: at least the travellers, I have consulted, knew nothing of it. Between the legs of the male figure, is a door leading into a most spacious temple,
ple, the dimensions of which, they could not describe otherwise, than by saying, that it could easily hold the camp equipage and baggage of Zeman-shah, and of his whole army. It is remarkable only for its extraordinary dimensions: it is dark and gloomy; and there are a few niches, with the remains of some figures in alto-relievo. At the entrance are stationed a few wretched Banyans, who fell provision to travellers. The greatest part of the Samajés in Tágávi Bámíyan are still inhabited by Muslims, who live promiscuously with their cattle. I have been informed, that there are no other statues, than these three; but, from the numerous fragments, which are seen through the Tágáwis, there must have been several hundreds of them. They swerved to this day the Samach'b, in which the famous Vya'sa composed the Vedas; and others, where divers holy men gave themselves up to meditation, and the contemplation of the Supreme Being.

Persian authors are constantly confounding Bámíyan and Báhlac together; the first they call Bálkh-Bámíyan, and the second Bálkh-Bokhara; when they speak of the metropolis of the fire worshippers, it is to be understood of Bámíyan alone, according to the followers of Buddha, and the author of the Buddha-dharmachárya Sindhu. According to Persian authors, Bámíyan must have existed before the flood; but the followers of Buddha insist, that it was built by a most religious man called Shama, who appears from particular circumstances to be the same with the famous patriarch Shem; and that his posterity lived there for several generations. Hence Bálkh-Bámíyan is said to have been originally the place of abode of Abraham*, who, according to scripture, and the Hindu sacred books, removed with his father to distant countries to the westward.

* Th. Hyde, p. 29 and 494.
According to Diodorus the Sicilian, Bámíyan existed before Ninus: for this historian, like the Persian authors we have mentioned, has mistaken Báblac for Bámíyan; which he describes as situated among steep hills: whilst Báblac is situated in a low, flat country, and at a great distance from the mountains.

The natives look upon Bámíyan, and the adjacent countries, as the place of abode of the progenitors of mankind, both before and after the flood. By Bámíyan and the adjacent countries, they understand all the country from Sîfán to Samarcand, reaching towards the east as far as the Ganges. This tradition is of great antiquity, for it is countenanced equally by Persian authors, and the sacred books of the Hindus. The first heroes of Persian history lived, and performed there, innumerable achievements. Their sacred history places also, in that country, their holy instructors, and the first temples that were ever erected. In the prefatory discourses, prefixed to the Puránas, and which appear to have been added by a more modern hand, a general description of the whole world is inserted, which one would naturally suppose to be extrated from that Purána, to which it is annexed: but the reverse is actually the case: for it has no affinity whatever with such geographical notions as are to be found, occasionally, in that Purána. In these prefaces, if we may call them so; it is said, that Swayambhùva or Adam lived in the dwip of Puscarà, at the furthest extremities of the west. There seven sons were born unto him, who divided the world or seven islands among themselves.

This notion seems also to be admitted in the Treloiderpana, by the Baudhïjs, who give the name of Jambu to Puscarà: for by Jambu is understood the continent. Plutarch also lays that the inhabitants of Egypt, which is probably the dwip of Puscarà, considered their own country as the continent. Be this as it may, I have never
never found in the *Purānas* any passage, except one, that could in the least countenance such an idea. The passage alluded to, I discovered some days ago, in a legend in which it is said, that the father of *Satyavrata* or *Noah*, was born on the banks of the river *Chandra-bhāga* in the *dvāpa* of *Chandra*, which is one of the sacred isles in the west. There is certainly a river of that name in *Chandra-dvāpa*, even more famous in the *Purānas*, than another of that name in the *Panjāh*, and which is now called the *Chināb*. It is highly probable, that the words *Chandra-dvāpa* are an interpolation by some of the ignorant compilers of the *Purānas*, who have arranged this heterogeneous mass without method, and still left judgment: for in this same legend from the *Scanda purāna*, *Satyavrata* or *Noah*, is said to have left the banks of the *Chandra-bhāga*, at the head of a numerous army, in order to invade the country of *Dra-vira*, or the peninsula of *India*, which he conquered and annexed to his dominions.

*Bhālacr* or *Bāmīyan* are both situated in the country of *Vāblica* or *Vāblaca*; and as *Bāmīyan* was once the capital, it is possible, it might have been called also *Vāblica* or *Bhālac*. The origin of this appellation is rather obscure: it is however the general opinion, that it is derived from the plant, which produces *Affa-sētīda*, called in Sanscrit *Vāblica*, and is the *Silphium* of the historians of *Alexander*. It grows there in great abundance, and is reckoned superior to that of other countries. Others insist, that this plant was thus denominated from its growing in the country of *Vălica*, which, they say, was thus called from a certain sage of that name, who lived there: this is countenanced by *Cedrenus*, who says that *Peleg*, whom he calls *Phalec*, dwelled in the country of *Bacēra*, which seems to be derived from the Sanscrit *Vāblicērt* or *Balc-ter*, which signifies the country about *Vāblica*, or *Balk*. Thus the country of the *Byltae*, called *Baltistan*, is generally called by natives *Balut-ter*. Derivatives of this sort, though not pure *Sanscrit*, are however
ever very common all over India: thus they say Jum-gul-tery, or country about woods and forests. Shivauter, Brahmauter, Vischnauter, &c. imply a piece of ground, or a district belonging to Shiva, &c. or set apart for his worship. In Sanscrit, the compound Vahlica-tirar or Vahlic-tir, would signify the country on the banks of the river Vahlica. Bamiyan, as well as Cabul and Balikh, were at an early period in the hands of the Musulmans. There were even kings of Bamiyan: but this dynasty lasted but a few years and ended in 1215. The kings and governors resided at Ghulghuleh, called at that time, the fort or palace of Bamiyan. It was destroyed by Genghiz-Khan, in the year 1221; and because the inhabitants had presumed to resist him, he ordered them to be butchered, without distinction, either of age or sex: in his rage, he spared neither animals, nor even trees. He ordered it to be called in his own language Mau balig, or the city of grief and sorrow: but the inhabitants of that country, called it in their own dialect Ghulghuleh, which word, used also in Persian, signifies the cries of woe. To have rebuilt it, would have been ominous: for this reason, they erected a fort on a hill to the north of Bamiyan, which is called to this day, the imperial fort. This fort also was destroyed by Zingis the Usbeck, in the year 1628; and has not been rebuilt since.

According to the Puranas, Swayambhuv, or Adima, Satyavrata or Noah, lived in the north-west parts of India about Casimir. There Brahma' assumed a mortal shape according to the Matsya-Purana; and one half of his body springing out, without his experiencing any diminution whatsoever, he framed out of it Satarupa'. She was so beautiful, that he fell in love with her. As he considered her as his daughter, being sprung from his body, he was ashamed. During this conflict between flame and love, he remained motionless, with his eyes fixed on her. Satarupa perceiving his situation,
situation, and in order to avoid his looks stepped aside. **Brahma** unable to move, but still desirous to see her, a face sprang out upon him, toward her. Thus she shifted her place four times round him, according to the four corners of the world; and four faces grew up to his head. Having recovered his intellects, the other half of his body sprang from him and became **Swayambhuva** or **Adima**. **Swayambhuva** literally **Swayambhu-like** signifies, that **Brahma** or **Swayambhu** appeared in an assumed form, called from that circumstance **Swayambhuva**. The possessions of **Cardame'swara** were in the hills along the banks of the **Ganges**, to the eastward of the rest of mankind. His son **Capila**, a most religious man, performed for a long time religious austerities near **Hardwar**, where they shew to this day the place where he lived, under the name of **Capila-ṭhān**: hence the pass of **Hardwar** is sometimes called the passes of **Capila** or **Kupeleh**.

**Cardame'swara** is the destructive power united to a form of clay: **Iswara** attempted to kill his brother **Brahma**, who being immortal, was only maimed: but **Iswara** finding him afterwards in a mortal shape in the character of **Dacsha**, killed him, as he was performing a sacrifice. **Cardame'swara** is then obviously the **Cain** of scripture, and of course **Capail** is his son **Enoch**, and **Capila-ṭhān** is probably the city **Enochia** thus called after him. The **Muslimans** seem to have borrowed from the **Hindus** the appellation of **Capila** or **Ca'bil**, which they give to **Cain**, who is sometimes called **Capile'swara** in the **Purānas**; being an incarnation of **Maha'-deva**; **Enoch** was an incarnation of **Vishnu**, and is always called **Capila-muni**. **Capile'swara** was a **Muni** also; hence he is sometimes called, though improperly, **Capila-muni**; which inaccuracy has occasioned some confusion in the **Purānas**. **Capila-muni**, is represented as a most religious penitent, though somewhat choleric, and **HenoCH** or **C'ha-**
MOCH, for such is his name in Hebrew, implies that he was consecrated to God, and for ever devoted to his service.

Capila or Capila-muni, that is to say, Capila the silent contemplator, is generally found making tapasya at the mouths of rivers. Though found at several places at the same time, he is but one. Near Hardwar is Capila-jiban, where he made his first appearance. His father and mother were exceedingly happy when he was born; as they conceived him to be a gift, and also an incarnation of Vishnu, the preserving power; and they hoped, that he would preserve and comfort them. There at Capila-jiban, he was consulted by his mother the devout Devahuti, daughter of Swayambhuva, about the surest and best method to obtain Mochā or reunion to the Supreme Being. The exhortations of Capila, and his wife admonitions, are related in the Bhagavat and other Purānas. Devahuti withdrew afterwards to the forests on the banks of the Bindu-Sarovara lake, from which issues the Ganges; and is improperly called Man Sarovara. There she performed tapasyas for a long time, and was ultimately reunited to the Supreme Being, never to be born again.

In that country, on the banks of the Chinab, in the hills, was performed that famous sacrifice, which occasioned the death of Abel, according to the Scanda-purāna: an account of which, from the Hindu sacred books, I beg leave to lay before the Society, as, most probably, I shall not have an opportunity to resume this subject hereafter.

There had subsisted, for a long time, some animosity between Brahma and Mahadeva in their mortal shapes; and the latter on account of his bad conduct, which is fully described in the Purānas, had, it appears, given much uneasiness to Swayambhuva and Satarupa. For he was libidinous, going about stark naked, with
with a large club in his hand. Be this as it may, MAHA' - DE'VA, who was the eldest, saw his claim as such, totally disregarded, and BRAHMA' set up in his room: this intrusion the latter wanted to support; but made use of such lies as provoked MAHA' - DE'VA to such a point, that he cut off one of his heads in his divine form. In his human shape we find likewise DACSHA boasting, that he ruled over mankind. One day in the assembly of the Gods, DACSHA coming in, they all rose to pay their respects to him: but MAHA' - DE'VA kept his seat, and looked gloomy. DACSHA resented the affront, and after having reviled MAHA' - DE'VA, in his human shape, cursed him; wishing he might remain always a vagabond, on the face of the earth, and ordered he should be carefully avoided, and deprived of his share of the sacrifices and offerings. MAHA' - DE'VA irritated, in his turn cursed DACSHA, and wished he might die; a dreadful conflict took place between them, the three worlds trembled, and the Gods were alarmed. BRAHMA', VISHNU, and the whole assembly interfered and separated the combatants, who returned to their respective homes. They even effected a reconciliation, in consequence of which DACSHA gave one of his daughters, called SITA' in marriage to MAHA' - DE'VA. SITA' was an incarnation of DEVI': for SRI' - DE'VI' the wife of DACSHA, and daughter of ADIMA and IVA, entreated the Goddess, to give her one daughter exactly like herself: her request was granted, and DEVI' was incarnated in her womb. She was blessed also with an hundred daughters more. One day, as DACSHA was sitting with his wife, they both lamented that they had no male offspring. I command over the world, says DACSHA, great is my power and my wealth: but I have no son. They agreed to make a solemn sacrifice, in order to obtain one; on this occasion DACSHA convened gods and men; but he could not be persuaded to invite MAHA' - DE'VA: who took little notice of this neglect; for he is represented in all his AVATÁRAS, as perfectly indifferent either to praise or abuse. But his wife
was enraged; and insisted on her going. MAHA'-DE'VA did what he could to dissuade her from it, but in vain. She was treated with such contempt by her father, that, in a rage, she flung herself into the sacred fire, and thereby spoiled the sacrifice. MAHA'-DE'VA hearing of this, blamed her for her rash conduct, in thus spoiling the religious performance, and cursed her. In consequence of this curse, and for her improper behaviour, she was doomed to be born again, and to transmigrate for a thousand years into an inferior being. Thus she became a Picá: but MAHA'-DE'VA to please her, assumed the shape of a Pica or Picas under the title of PICE'SWARA or PICE'SA-MAHA'-DE'VA. He is more generally known by the name of Cocile's'wara-MAHA'-DE'VA: Cocila (Coculus) being another name for the bird Pica or Picas*.

MAHA'-DE'VA afterwards went up to BRAHMA', in the character of DACSHA; and after a great deal of abuse, began to beat him; the confusion became general in the whole assembly, who all took the part of DACSHA: but SIVA striking the ground with the locks of his Jata, produced two heroes, and a whole army of demons came to his assistance; the battle raged, and during this general conflict MAHA'-DE'VA cut off DACSHA's head: several of the Gods were wounded, particularly the Sun and Moon; Heaven, Hell, and the Earth trembled.

The Gods at last humbled themselves before MAHA'-DE'VA, who was appeased; and order was re-establisht through the whole assembly. The Gods requested MAHA'-DE'VA to restore DACSHA to life, which he promised to do; but the head could not be found, for dur-

* Pica in Sanscrit is the name of the Cuckoo: but it was once taken in a more extensive sense; for we read in glossaries, that Pica is the name of such birds as pick their food out of holes. In this sense the bird Picus is certainly a Pica. The root of the word Picus is lost in Latin, but it is preserved in Gothic and most of its dialects.
ing the fray, it fell into the fire, and was burnt. They brought a he-goat, whose head they cut off, and placed upon the lifeless corpse of Daśha, who instantly re-vived: but he remained weak and without power till he was born again a son of Noah.

Maḥa'-de'va then took up the body of his beloved Sīta on his shoulders, and went seven times round the world, bewailing his misfortune. Here I shall remark that, when any accident happens to the Gods, they generally set off at full speed, going seven times round the world, howling all the way most woefully.

The gods, whom Sīta contained in her womb, burst out, her limbs were scattered all over the world; and the places, where they fell, are become sacred. Her breasts fell near Jalānder in the Panjab; the yoni into Afsam, and the gūhya* into Nepāl, where they are most devoutly worshipped to this day. The latter is a small cleft in a rock, with an intermitting spring: it is called Gūhya-sthān.

Puja, with offerings, are directed to be made to Pi-ce'sa, whenever there happens to be in the year two months of Afsaad'ha, the second of which, is emboli-mic. The first Afsaad'ha, is reckoned impure, and the religious rites are to begin on the day of the full moon, if possible: if not on the third or seventh day. For this purpose an image of the Picas is to be made; the body of gold, the wings of precious stones, the beak of red coral, and the eyes also of a precious stone of a red colour, called manica. Women particularly ought to be cautious not to omit this religious performance, on any account whatever; should any woman fail in this, she will be born a Vyali (a snake) in the forests. Whatever woman performs it duly, will have many

* Podex.
children, and her husband shall not die before her: for Parvati is highly delighted with prayers and offerings in that intercalary month. Picessa Mahadeva is probably the Jupiter Picus of the Latians: some pretend that this metamorphosis happened in Syria, others in Italy: but the Hindus insist that it happened in the mountains to the north of the Pánjáb. Though Picus be said to have appeared in the time of Adima: yet as, according to the Puránas, the same concatenation of events reappears in every Manwantara, the same story must have happened of course in the time of Satyavrata, or Noah.

In the Puránas, the Ganges is represented as remaining concealed for a long time in the hills; at the prayers of a certain holy man it entered the plains of Hindustan till it reached Benares: then gradually advancing, it found at last its way into Bengal. As the whole country from Hardwar to the sea was annually overflowed in such manner as to render the greatest part of it unfit for cultivation, Bhagiratha restrained the inundation between certain limits. The Chinese relate the same story of Foji, who surveyed the course of the yellow river to its source, and by proper embankments, restrained its destructive overflows. Capila, always fond of the sea shore, followed the Ganges: we find him afterwards meditating near a place called Mooragattha in Major Rennell's Atlas, to the south of Calcutta, not far from Fulta, and at that time close to the sea. Here he was insulted by the children of Sagar, whom he reduced to ashes by a single look: this place is called the old Sagar, and is probably the place called Oceanis by Diodorus the Sicilian, for Sagar and Oceanis are synonymous words. There the Ganges seeing Samudr or Oceanus was frightened, and fled back through a thousand channels: thus the Puránas account for the retrograde motion of the waters of the Ganges twice a day.
Capila is now performing Tapasya at Ságar island, where his śhán or place, is about five miles from the sea; the Delta of the Ganges having thus far encroached upon the sea, since the erection of this last śhán. Cardameśwara is thus called, when considered as a divine emanation from Iswara, but he seems to be Priyavrata, when considered as a mortal. For whenever the deity condescends to be born of woman; the person is one, but there are two natures. To this distinction we must carefully attend, in order to reconcile many seeming contradictions in the Purānas; and more particularly so, with respect to Vaivaswata and Satyavrata; who are acknowledged to be but one person: the divine nature is an emanation of Vishnu in his character of the Sun; and Satyavrata is the human nature; these two natures often act independently of each other, and may exist at the same time in different places.

From particular circumstances it appears, that Satyavrata before the flood lived generally in the countries about the Indus, between Cabul and Cashmir; and if we find him in Dravira or the southern parts of the peninsula, it seems that it was accidentally, and that he went there only for some religious purposes. Even after the flood, he resided for some time on the banks of the Indus. According to tradition, which my learned friends here inform me is countenanced by the Purānas, he lived and reigned a long time at Bettoo; on the banks of the Ganges and to the south of Canoge. In the Varaha-purāna, Vasu, the father of Vivaswata, is declared to have been king of Cashmir, and the adjacent countries. They shew to this day the tomb of his father Lamech, as mentioned in the Ayeen Akbery, at a place called Naulakhi, between Alisbung and Munderar; about twelve or thirteen miles to the north-west of Jalálábád in the country of Cabul. The Mufulmans called him Peer Maitlam; and in the dialect of Samarcand, Maiter or Maitri Bur-kha'n. The Bauddhists say, that it is Budd'ha-Nara'yana, or Buddha dwelling in
in the waters: but the Hindus, who live in that country, call him Mach' Hodar- Nath* or the sovereign prince in the belly of the fish. All these denominations are by no means applicable to Lamech; but to Noah alone. The tomb is about forty cubits in length: which was actually the statue of Lamech according to tradition: under it is a vault of the same dimensions, with a small door which is never opened, out of respect for the remains of this illustrious personage. They say, that his body is in high preservation, and that he is sitting in a corner of the vault on his heels, with his arms crossed over his knees, and his head reclining upon his hands; a favourite posture among the inhabitants of India.

Vaivaswata, both in his divine and human character, or nature, is certainly, Maitla, Maiter-Burkhan and Buddha-Nara'yan. Maitla or Maitla'm is a derivative form from the Sanscrit Mait, which implies the comfort of Lacshami, and the owner of her wealth, an epithet often applied to rich men; and may be translated mighty: but it properly belongs to Vishnu, and his various incarnations. Prithu, according to the Puranas, was an incarnation of Vishnu, and the comfort of Lacshmi; as I have shewn in a former essay on the chronology of the Hindus.

It is probable, that when the Musulmans conquered that country, they pronounced the word Maitla'm Maiter- Lam; and concluded that he was the same with Lamech the father of Nuh. The Afghans always use the word Maiter instead of Hazeret, and thus say Maiter Mohammed, Maiter Isa, Maiter Soleiman, for Hazeret Isa, Hazeret Mohammed, Hazeret Soleiman. Hazeret in Persian is a title, by which kings are addressed, and holy men mentioned; it implies dignity and excellence: Maiter from the Persian Mehtur, signifies also a lord,

* This word is spelt Mach' hodara in Sanscrit.
prince, or chief. The Mufulmans, and Hindus of that country, I had an opportunity to consult, informed me, that according to tradition, the famous Sultan Mah- mood, of Ghazni, hearing of the tomb of Maitla'm; and of the miracles daily performed there, conceived that the whole was done through magick; and accordingly resolved to destroy it: but, being disturbed by frightful dreams, he desisted, and having made particular inquiries about Maitla'm, he was fully satisfied, as well as the learned about his person, that he was Lamech, the father of NuH. Since that period Maitla'm is revered as a Peer, or saint, by the Mufulmans of that country. Maiter Burkha'n, or Burgha'n, in the dialect of Samarcand, as I am informed, signifies, literally, the lord and master. In several Tartarian dialects, God is called Burkha'n, or the lord.

The title of Mach'hodar-Nait'ha is by no means applicable to Lamech; but properly belongs to Noah; for by the belly of the fish they understand the cavity, or inside of the ark. There is a place under ground at Banares, which they call Mach'bodara. The central and most elevated part of Banares, is also called Mach'bodara, because, when the lower parts of the city are laid under water by some unusual overflowing of the Ganges, this part remains free from water like the belly of a fish. The city also is some times thus called, because, during the general floods, the waters rise like a circular wall round the holy city. In short, any place in the middle of waters, either natural or artificial, which can afford shelter to living beings, is called Mach'bodara.

The place, where Lamech is supposed to lie entomb- ed, is called Naulakhi, a word, which signifies nine lakhs; because, it is said, Sultan Mahmood granted to this holy place a yearly revenue of nine lakhs of rupees. Be this as it may, this foundation no longer exists: and I believe it never did. The real name is probably

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Nau-
Nau-Laca, or Nuh-Laca, which in the language of that country, implies the place of Nuh or Noah: at least there are many places in that country, the names of which end in Laca or Laki, such as Ebau-lac, Gauzlac, &c.

Close to Ayudhya or Oude, on the banks of the Gagra, they shew the tomb of Noah and those of Ayub, and Shis or Sish (Job and Seth). According to the account of the venerable Dervijhy, who watches over the tomb of Nuh, it was built by Alexander the Great, or Secunder Rumi. I sent lately a learned Hindu, to make enquiries about this holy place: from the Musulmans, he could obtain no further light: but the Bráhmens informed him that where Nuh's tomb stands now, there was formerly a place of worship dedicated to Ganesa, and close to it are the remains of a Bowly, or walled well, which is called in the Puranas Gana-put cunda. The tombs of Job and Shis are near to each other; and about one bow shot and a half from Nuh's tomb; between them are two small hillocks, called Soma-giri, or the mountains of the moon. According to them these tombs are not above four hundred years old; and owe their origin to three men, called Nuh, Ayub, and Shis, who fell there, fighting against the Hindus; these were of course considered as Shéhids or martyrs: but the priests, who officiate there, in order to encrease the veneration of the superstitious and unthinking crowd, gave out that these tombs were really those of Noah, Job, and Seth of old. The tomb of Nuh is not noticed in the Ayeen-Akberiy, only those of Ayub and Shis.

Mach'ho'dara-Na't'ha is not unknown in China; at least there is an idol near Pechin (Pekin), which is supposé by pilgrims from India and Tibet, to represent Mach'ho'dara or Maitre-Burgha'n. This account I received from a famous traveller called Arce'swara, who was introduced to my acquaintance by Mr. Dun-
can * three years ago. He said, that the Myau or temple, is at a small distance from the north-west corner of the wall of Pechin, and is called Mahá-Cála-Myau, from its chief deity Maha'-Ca'la, who is worshipped there, and whose statue is on one side of the river, and the Myau on the other. That in one part of the Myau, is a gilt statue of Mach'-ho'dara-Na'fh, about eighteen feet high; in another part is the Cháran-pad, or the impression of the feet of Datta'tre'ya or Datta, called Toth by the Egyptians. There is a convent and a Lama. What are the Chinese names of these deities, he could not tell. This astonishing traveller first visited the most famous places of worship in the northern parts of India, as far as Bahlk, and the borders of Persia. Though a Bráhman, he had a regard for the worship of Jina, and renouncing his tribe, he resolved to visit the living Fohs. I shall here exhibit the outlines of his peregrinations, which are as accurate as can reasonably be expected from a man who declares, that he did not travel for the purpose of geographical information, and who never imagined he should be requested to give an account of his travels.

According to Arce'swaras account. According to the maps of the Jesuits.

From Benares to Nepal - - Nepál
Laffa - - - Laffa
Chéri, south-east of Laffa - - Djiri
Country of Letanh - - Laton
Then turning toward the west, he entered the country of Combo, where he adorned the Lama'-Combo -

to Sámá'-Jerbu - - - See Alphab.
Bridge of Sama.

* Jonathan Duncan, Esq. now governor of Bombay.
to Caucáfu

Cocofay custom-house.

Country of J ésbrám

Sinin.

Silin

Urtous.

Croffed the Hárá-Moren and enter-

Urat.

ed the country of Urdufu, which

Croffed again the Hára-Moren, and

entered the country of Urát,

Then turning to the north-west, he

entered the country of a famous

Kalka chief, called B h a'c a' -g u.

Thence into the country of the

Tolen-cáfu-Kalkas; thus called

from the river on the banks, of

which they live,

Tola-pira or ri-

ver Tolá.

He went afterwards to pay his adorations to the T a'-

r a 'n a' th, the place of whose residence is marked in

the maps between the rivers Selinghei and Orgun. This

living Fo h is well known in the northern parts of India,

under the name of T a' r a 'n a' th, and is mentioned in

B e l l ' s travels.

In three months he went into the country of Chitcár-

Naymánn-cáfu, in the maps T e it c i é r and N a y m a n n.

Thence to Tálá-Nor, the T a a l - N o r of the maps. He

then entered C h i n a , through the breach made in the great

wall, for the conveyance of the remains of the emperors

to their place of burial, which he says is called E k b o r by

the Tartars, and S é c h i n by the C h i n e s e : thence to P e k i n

called by the C h i n e s e P é c h i n. He returned from his ex-

pedition about three years ago, and shewed to Mr. D u n-

c a n and to me the numerous R a h d á r e s or passports he

obtained from the various chiefs and L a m a s he had visit-

ed. They are written in the characters of the countries

he went through, namely of T i b e t, the M u n g u l T a r t a r s,
and of China. He is now gone to visit the places of worship in the southern parts of India; after which he intends to come and die at Benares. A near relation of his is in my service as a pandit.

It may appear strange, that the posterity of Cain should be so much noticed in the Purānas, whilst that of the pious and benevolent Ruchi is in great measure neglected: but it is even so, in the Mosaic account of the antediluvian history: where little is said of the posterity of Seth; whilst the inspired penman takes particular notice of the ingenuity of the descendants of Cain, and to what high degree of perfection they carried the arts of civil life. The charms and accomplishments of the women are particularly mentioned. The same became mighty men, which were of old, men of renown. The antediluvian history of Sanchoniathon is obviously that of the posterity of Cain. We have been taught to consider the descendants of Cain, as a most profligate and abominable race: this opinion, however, is not countenanced, either by sacred or profane history. That they were not intrusted with the sacred deposit of religious truths to transmit to future ages, is sufficiently certain: they might in consequence of this, have deviated gradually from the original belief; and at last fallen into a superstitious system of religion, which seems also a natural consequence of the fearful disposition of Cain, and the horrors he must have felt, when he recollected the atrocious murder of his brother. Be this as it may, their worldly achievements passed to posterity, whilst the peaceful and domestic virtues of the descendants of Seth sunk into oblivion. Out of five Menus, who ruled as lords paramount between Adima and the flood, according to the Purānas, four were of the posterity of Cain.

Thus, according to an uniform tradition, of a very long standing, as it is countenanced by the Hindu sacred books, and Persian authors, the progenitors of mankind lived
lived in that mountainous tract, which extends from Bâlkh and Candâhâr to the Ganges; we may then reasonably look for the terrestrial paradise in that country; for it is not probable, that Adima and Adima’ or Iva should have retired to any great distance from it. Accordingly, we find there such a spot, as answers minutely to the Mosaiical account; a circumstance, I believe, not to be met with any where else on the surface of the globe. A small brook winds through the Tâgâvis of Bâmîyan, and falling into a small lake, divides itself into four heads, forming so many navigable rivers. The first called Phison compasses the whole country of Châvilâ, where gold is found: and the gold of that country is good: there is also Bdellium and Sardonyx. The country of Châvilâ is probably that of Cabul: it is a very ancient denomination; for Ptolemy calls its inhabitants Cabolite, and the town itself Cabura, which is obviously a corruption from Cabul; for the Persian name for a shed or pent-house is indifferently pronounced Cabul and Cabur. Tradition says, that Cabul was built by an ancient king of that name; and the place where he lived, is still shewn near Cabul: they generally call him Shah Cabul. Gold is found in the sands of the Indus, above Derbend, but in greater quantity about Câbul-grâm, to the north of Derbend, and in the rivers, which fall into the Indus from the west. It is found also near the surface of the earth in these parts, but the natives are too indolent to dig for it. The gold found in the sands, I am told, is not so pure as that found by digging the earth to a considerable depth. This country abounds with divers sorts of precious stones, such as the Lapis Lazuli, the Yacuth or hyacinth, crystal, marble of various colours, and razor stones of a superior quality. The Phison appears then to be the Landi-Sindh, or lesser Sindb, called also Nilîb from the colour of its waters, which are deep and limpid. This river is also denominatad the Nilâ-Gangâ, or simply Gangâ by Hindus; and it is called Ganges by Isidorus, when he says that the best Assa-fetiida grows on the mountains of Ofsebagâ, at the source of the Ganges. Ofsebagâ
Osobagi is obviously derived from Jeshu-Bec, the lord Jeshu, another name for the famous Rasa'la or Bron-gus, who dwelt at Bámíyan, whose colossal statue is to be seen there to this day, and of whom I shall speak more fully hereafter. The true name of that place commonly called, Ybawg and Jybuck by Major Rennell, between Cabul and Bálkh, is Ai Be'g Dominus Lunus, our Lord the Moon. There are in its vicinity, in the mountains, several curious remains of antiquity. Jerome says also that the Phison was called Ganges in his time. They were both perfectly right, though it is almost certain, that they understood by it the great Ganges. Hesychius says, that the Phison was thus called, because it flowed from a fissure, gap, or mouth. If so, this appellation is synonymous with Cophes, the ancient name of the Landi-Sindh, as will appear hereafter.

The second river was the Gibon, which compassed the land of Cufh: this is the Hir-Mend; and the country is the original land of Cufba of the Puránas, which begins near Candahar, and includes part of Iran or Persia. In a former essay on Egypt, I had carried too far the eastern limits of that country.

The third river is the Hiddekel, which runs toward, or through the eastern parts of the land of Assir. This appears to be the river of Báblac, which runs through the eastern parts, and seems to have been once the eastern boundary of the land of Hazzarah or Házárah. This country extends from Herát to Báblac and Bámíyan: from the unsettled disposition of its inhabitants, its boundaries cannot well be defined. They consider themselves as the aborigines of that country; and like the Arabs, were never thoroughly subdued. They are very numerous, brave, but incapable of discipline. They are Musulmans; but retain still many heathenish, and superstitious customs, at least in the opinion of their neighbours. The principal tribes are the Dácándi, Taimání, &c. the first live between Herát and Dawar: and
the others toward *Marv. Shójéhán*. This is probably the country of *Arsareth* of the apocryphal book of *Esdras*. The fourth is the *Frát*, of which no particulars are recorded; it is the river of *Cundus* *Musulmans*, as well as *Christians*, have assigned various situations to the garden of *Eden*\(^*\): and there is hardly a country on earth, or a region in heaven, but has been ransacked in search of it: whilst some of the fathers have denied even its existence. The *Hindus* are equally extravagant: they place it on the elevated plains of *Bukbara* the lesser, where there is a river which goes round *Brahmá-puri*, or the town of *Brahma*; then through a lake called *Mansarovara* (the existence of which is very doubtful), and is erroneously supposed by travelling fackeers to be the same with that, from which the *Ganges* issues, which is called in *Sanścrit* *Bindu Sarovara*. From the *Mansarovara* lake, come four rivers running towards the four corners of the world, through four rocks cut in the shape of the heads of four animals; thus taking literally the corresponding passage of scripture. The *Cow's* head is toward the south, and from it issues the *Gangá*; toward the west, is a *Horse's* head, from which springs the *Choʃbu* or *Choʃbus*: it is the *Oxus*. The *Sitá-gangá*, or *Hoang-ho*, issues from an *Elephant's* head; and lastly the *Bhadra-gangá* or *Jenisea* in *Siberia*, from a *Tyger's* head, or a *Lion's* head according to others.

The *Hindus* generally consider this spot, as the abode of the Gods, but, by no means, as the place, in which the primogenitors of mankind were created; at least I have not found any passage in the *Puránas*, that might countenance any such idea; but rather on the contrary. As it is written in the *Puránas*, that on mount *Méru*, there is an eternal day for the space of fourteen degrees round *Su-meru*; and of course an eternal night for the same space on the opposite side; the *Hindus* have been

\(^*\) The word *Eden* is perhaps derived from the Sanskrit *Udyán*, which as well as *Váticá*, signifies a garden.
forced to suppose that Su-meru is exactly at the apex, or summit of the shadow of the earth; and that from the earth to this summit, there is an immense conical hill, solid like the rest of the globe, but invisible, impalpable, and pervious to mankind: on the sides of this mountain are various mansions, rising in eminence and pre-excellence, as you ascend, and destined for the place of residence of the blessed, according to their merits. God and the principal deities are supposed to be seated in the sides of the north, on the summit of this mountain, which is called also Sabha, or of the congregation. This opinion is of the greatest antiquity, as it is alluded to by Isaiah, almost in the words of the Pauranics. This prophet describing the fall of the chief of the Daityas, introduces him, saying, "that he would exalt his throne above the stars of God, and would sit on the mount of the congregation, in the sides of the north." The mountain, or hill of God, is often alluded to in scripture.

Some Hindu astronomers, ashamed of this ridiculous superstructure, endeavour to reconcile the Puránas to nature, by supposing that the sun at some remote period, revolved in such parallel of altitude to Su-meru, as to afford constant light for the space of fourteen degrees round this point, and constant night for the same space round Cu-meru. Thus by placing the north pole on the elevated plains of the leffer Buchára, and forcing the sun out of the ecliptick, they explain the alteration, which is supposed to have taken place on the west and east points; whilst the north and south points, as they say, remain unmoveable. This alteration, they tell us, was not perceptible, at least very little, in the countries to the south of Meru, but in those to the north of it, the sun appeared to rise in the west and to set in the east. As long as the Hindus considered the earth as a flat table with the immense conical mountain of Meru, rising in the middle, and intercepting the rays of the sun, during part of its diurnal course; the points of east and west must of course have been entirely inverted beyond Meru.
In the first passage I met with, in the Puránas, relating to the sacred isles in the west, by which we are to understand the British islands, Iceland and Fero, it is positively declared, that they are situated to the east of Scanda-dwíp, which is Scandia, or Scandinavia; accordingly I looked for them in the seas, to the eastward of that famous peninsula, particularly as Pliny seems to place there the island of Elixoia, supposed by some, to be the abode of the blessed: but my chief pandit warned me, with much earnestness not to be too hastily: that this instance from the Puránas was deemed to be the only one, in which the sacred isles were asserted to be to the eastward of Scandia; and that he would produce numerous passages in which these islands were declared to be to the westward of Scanda-dwíp, or in a derivative form Scandéya: and that, from numberless particular circumstances, he would prove to my utmost satisfaction, that Scandéya was really to the eastward of Samudran-toraca, a name by which the sacred isles are sometimes called, because they are in the middle of the ocean. As the Bráhmens would rather suppose the whole economy of the universe disturbed, than question a single fact related in their sacred books, he then informed me, that this single passage alluded to a remote period, in which the pole of the globe, the course of the sun, were different from what they are now, in consequence of which there was a time, when the sun appeared to the inhabitants of Scandia, to rise above the sacred isles. But let us return to the terrestrial paradise.

The followers of Buddha in Tibet place the garden of Eden at the foot of mount Meru toward the south west, and at the source of the Ganges. The sacred rivers, according to them, are the Ganges, the Indus, the Sámen, and the Sítá-gangá; by which they understand the Sirr or Jaxartes, which is also called Sítá-gangá in the Puránas. They have the same number of heads of animals, which are disposed in the same manner; and the divines of Tibet, and of India consider these four animals
animals as the original guardians of the four quarters of the world. In the same manner commentators have considered the four sacred animals mentioned in scripture, namely, the Man, the Bull, the Lion, and the Eagle, as the guardians and messengers of the four corners of the world.

The few Hindus, who live toward the Indus, insist that the lake near Bámíyan, is the real and original Mansaróvara: and near Cabul a little to the north west of Sácárdará, is a small lake, which they call the leffer Mansaróvara, and which corresponds to a similar lake to the south of Bindu-saróvara, called in the Puránas, the eyes of Mansaróvara.

Bráhmens in general understand by Meru or Su-meru the north pole, in opposition to numerous passages in the Puránas. Their system of geography has reference, in general, to the spot in which they suppose the terrestrial paradise to be, or rather the abode of the Gods, called Su-meru, hence we read of countries to the W. N. W. of Meru, &c. The immense country of Curu is repeatedly declared in the Puránas, and by Bráhmens, in conversation, to be situated to the north of Su-meru. Even in their maps of the seven dezips, Su-meru is placed a great way to the south of Siddhá-puri, which they uniformly acknowledge to be exactly under the north pole.

Curu, which includes Russia and Siberia, is divided into two parts, Uttara-Curu, or north Curu, and south Curu. In the Puránas, particular notice is taken of the extraordinary length of the days in Uttara-Curu: and it is added, that in the island of Puscsara, which is asserted there to be situated at the furthestmost extremities of the western world, the length of the days is the same as in Uttara-Curu. This places Puscsara under the polar circle, at least under the sensible one: this island will appear, in a future essay, to be Iceland. It is further added, in the Puránas, that the shores of that immense country,
country, which encompasses what we call the old continent, and the Atlantick sea, &c. passes between the islands of Puscarā, and Uttara-meru, or the north pole: indeed the shores or Greenland, tending towards the north east, may have given rise to such an idea. However, this shews plainly, Uttara-meru, or north Meru, to be different from Su-meru. Meru signifies an axis, and the two extremities of the terrestrial axis are called Uttara-Meru and Daesbin-meru, the northern and southern Meru, or pole. The line passing through the centre of the earth and the supposed terrestrial paradise, to which they generally refer in the Purānas with respect to bearings, is also Meru; and its two extremities, called Su meru and Cu-meru, are only the zenith and nadir points of that abode of the Gods.

The Musulmans in the countries adjacent to Bámīyan, insist that Adam, (whom they call also Keyumursh) and Eve, having been driven out of paradise, wandered separately for some time, till they met accidentally at a certain place, where saluting each other with mutual embrace, the place was accordingly called Bábla, or, in derivative form, Báblaca, or the place of embrace. This is the general opinion of the natives: whilst others, considering that the termination ac, or ach, signifies brother, will have it to imply the place where he embraced his brother; and of course suppose that Keyumursh had one. The first etymology is, I believe, countenanced by Abulfida.

When Satan was ejected, or kicked, as they say, out of the garden of Eden, where he first lived, he leaped over the mountains, and fell on that spot, where Cabul now stands: hence the origin of the well known proverb, that the inhabitants of Cabul are truly the offspring of this prince of darkness. Those of Cabul do not deny his having been at Cabul; but say, he had no offspring, was soon conjured away, and withdrew into the district of Lamgan.
It appears from scripture, that Adam and Eve lived afterwards in the countries to the eastward of Eden; for at the eastern entrance of it, God placed the angel with the flaming sword. This is also confirmed by the Puránics, who place the progenitors of mankind on the mountainous regions, between Cabul and the Ganges, on the banks of which, in the hills, they flew a place, where he resorted occasionally, for religious purposes. It is frequented by pilgrims, and is called Swayambhunāwa-fhān: I have not been able yet to ascertain its situation, being but lately acquainted with it: but I believe it is situated to the north west of Sri-Nagar.

At the entrance of the passles, leading to the place, where I suppose was the garden of Eden, and to the eastward of it, the Hindus have placed a destroying angel, who generally appears, and is represented like a Cherub; I mean Garud'ā, or the Eagle, upon whom Vishnu and Jupiter are represented riding. Garud'ā is represented generally like an eagle; but in his compound character, somewhat like the Cherub, he is represented like a young man, with the countenance, wings, and talons of the eagle. In scripture, the deity is represented riding upon a Cherub, and flying upon the wings of the wind. This is the Simurgh of Persian romances, who carries the heroes from one extremity of the world to the other. Garud'ā is called the Vahán* (literally the vehicle) of Vishnu or Jupiter, and he thus answers to the Cherub of scripture; for many commentators derive this word from the obsolete root C'harab in the Chaldean language, a word implicitly synonymous with the Sanscrit Vahán.

An accurate translation of the legends relating to Garud'ā, Prometheus, and the building of Bāmiyan,

* Hence the Latin words Vehu, &c. In the southern dialects of India, they generally pronounce the letter h hard like g; thus for vahán, they say vagán, a waggon: for mahā, great, they say megā, hence the Greek word mega.
The city of Bámíyan being represented as the fountain of purity and holiness, it was called with propriety Pa-rá-Bámíyan or Bámíyan, the pure and holy; for the same reason the district of Bámíyan might be called Pará-dé-fa, or Párá-dé-fa, the pure and holy country. This district is now barren, and without a single tree. The sacred books of the Hindus, and of the Bauddhïs, do, however, declare most positively, that it was otherwise formerly. Tradition informs us also, that the number of inhabitants was at one period so prodigious, that the trees, underwood, grass and plants were destroyed. The vegetable soil being no longer protected, was in the course of ages washed away by the rains: certain it is, that the soil in the valleys is most fertile, and the whole district, such as it is now, is still a most enchanting and delightful spot. The country to the eastward of Bámíyan, as far as the Indus, is the native country of the vine, and of almost all the fruit trees we have in Europe: there they grow spontaneously, and to a great degree of perfection. When the natives find a vine, an apple tree, &c. in the forests, they clear all the wood about it, dig the ground, and by these means, the fruit comes to perfect maturity. When we are told in scripture of Noah cultivating the vine, we may be sure, that it was in its native country, or at least very near it.

Bámíyan, though not mentioned by name in Non-nus’s Dionysiaës*, is well described by him as the abode of the benevolent Brongus, who lived in Samach’bes, or recesses artfully excavated in the mountains. Brongus is obviously the Bhrāngā, or Bhrāngas of the Purānas, called also Sarasa’la, and of whom I shall speak more fully hereafter. Brongus had two sons, who were highly respected by Doriaden, perhaps the Dīryodan of the Purānas. Bhrāngā, or Sarasa’la, had also several children, who ascended the throne of

* B. 17, v. 40, &c.
Calingá, after their father had forsaken the world, and withdrawn to Bámíyan, to give herself up to contemplation.

Bámíyan appears also to be the town called Draßtaca by Ptolemy; which is derived from the Sanscrit Draßtaca, and implies the stone city: towns before being only an assemblage of huts. Its distance and bearing from Cabura, or Orthóspána, the present city of Cabul, puts it beyond doubt. One of the Sanscrit names of Cabul, is Asā-vana, and sometimes, by contradistinction, Urdu b' As-vana, or, as it is always pronounced in the spoken dialects, Urdu b' Asbán or Asbána. The upper Naulibis, or Nilábi, in Ptolemy, falls in at Ghór-bund, or Goracsha-van, in Sanscrit, which appears to be the Alexandria ad Paropamisum of the historians of Alexander. It was called Nilábi, from its being situated on the banks of the Niláb. The immense ridge between Nilábi and Draßtaca, or Draßtaca, is properly delineated in Ptolemy. Alexandria ad Paropamisum was near the cave of Prometheus, which is to be seen to this day near the pass of Sheibar, between Ghór-bund and Bámíyan. Orthóspána, or simply Asbána, is mentioned in the Pentingerian table. It is called also in Sanscrit, Jayini'-de'vi'-Asbán, or the place of the goddess of victory, and is the Nicēa (a word of the same import) of the historians of Alexander. The place where her temple stood, is close to Cabul, and is still secretly visited by Hindu pilgrims. Jayini'-de'vi' and Asa-de'vi' are the same deity: the latter signifies the goddess, who grants the object of our aṣā, or wishes. She is called also Asya'ca in a derivative form, and the place is called by the Musulmans, Ascān-ārsān, who have thus altered the old name into an Arabick denomination of the same import nearly; for it signifies, he who knows our aṣbee, or wishes. There is the tomb of a saint, who now officiates in the room of Asa-de'vi', and grants to devout Musulmans the object of their wishes.

The
ON MOUNT CAUCASUS.

The Nicæa of the historians of Alexander, is probably the Nicæa of Nonnus*, which he calls also As- tacia, probably for Asfâcia or Asfyâcia: for, according to the Purânas, Jayini'-de'vi', or the nymph Nicæa, was also called Asfyâca; Asfâca would be as grammatical; and the town of Asfâca or Asfyâca, in a derivative form, would be Asfyâceya or Asfâceya, or, according to the idiom of the Greek language, Asfâcia and Asfâcia.

The Parapomisean hills, or at least part of them, are called also Parnassus, and Parnassus, by Dionysius Periegetes, Priscian, and F. Avienus: this last appellation has been supposed to be only a corruption, or contraction from the first. But the difference is so great, that, in my humble opinion, there are really two different denominations of the same mountainous tract, at least, of part of it. These mountains are in general called Dévanica in the Hindu sacred books, because they were full of Dévâs or gods, and holy Râbis and Brâhmens, who are emphatically called the gods of the earth, or Bhu-dékas. They lived, according to the Purânas, in bowers or huts, called Parhadâlas or Parhásas, because they were made of leaves, for such is the Sanscrit expression, whilst we should say, built with twigs and branches. Indeed the leaves are the most conspicuous part, because in India, when dry, they generally adhere still to the boughs they grew upon. The most celebrated amongst these Parhásas was that of the famous Atri, whose history is closely connected with that of the Britês islands, and other western regions. It was situated on an insulâted hill, called in the Purânas, Meru, and by the Greeks, Meros. It is supposed by the Hindus to be a splinter from the larger Meru; and that the Gods come and reside upon it occasionally. Its situation was ascertained by the late Mr. Foster, by my friend Mirza-Mogul Beg, and by P. Montserrat, who accompanied the emperor AČbar in his expedition to Cabul in the year 1581. It

* B. 16 in fine.
is called to this day *Mer-coh* and *Mar-coh*, or the mountain of *Mer* or *Meru*; for in the spoken dialects, they often say *Mer* for *Meru*, and in the *Treloci-derpama*, we constantly read *Mer* for *Meru*. It is on the road between *Peishber* and *Jaldalabád*; and about twenty-four miles from the latter, on the banks of the *Landi-Sindh* or *Cameh* river. It is now a bare rock, the river which formerly ran to the south of it, having carried away all the earth from the lower parts; and the earth above being no longer supported, was also washed away by the rains. From its dismal appearance, it was called *Bé-dowlat* by the emperor *Humá'yun*. It looks like a single stone, without any fissure. It extends from the west to the east. It rises abruptly from the plain in which it stands; from the bottom to the top; P. *Monserrat* reckons about 2000 feet, and it is about six furlongs in length: its distance from the nearest hill is about three miles. The ground to the south and east is marshy, being the old bed of the river: to the west are seen several triangular entrances into caves. To the east at the distance of three miles, is a wretched village, called *Bisfour* or *Bisfowly* (*Bisfowul* in Major *Rennell's* map) which about two hundred years ago was a pretty large town. To the west are the villages of *Ambárcáná* and *Battercôte*, close to which *Na'dirsha'áth* encamped; and as there is no other encamping ground near this place for a numerous army, we may safely conclude this to be the very spot on which *Alexander* encamped near the town of *Nyša*, which extended all round the mountain. Besides, his camp was near the sepulchres of the inhabitants, which were to the west of the mountain.

On this mountain, it is declared in the *Puránas*, was the *Parhafálá*, or *Parhásá*, of *Atri*: there they shewed formerly a cave, in which he used to retire occasionally.

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*The*
The word Parhá signifies the leaf of a tree, a feather, and a wing. Its derivative Parháfa, signifies any thing made of leaves; such as baskets, hats, pens, coops, huts, &c. It signifies also any thing that is radiant; hence the learned affirm, that the word Parhá was formerly synonymous with Cirafá, or ray, though now never found in that sense. In the north-west parts of India, in the Pàskeo language, it is pronounced Panna and Pannai in the plural: hence I conceive the word Parna or Panna, to be the root of the Greek and Latin words Pinna; and of the Saxon and English words pen, fin, pin, penn, and also of the name of that plant, with pinnated leaves, called fern in English, and in Greek Pteris, the pinnated or winged: Parnica is another regular derivative, some times used in composition, as well as Parhaca; and, as in the first ages, mankind either lived in Gòpas, caves, or in huts built of branches and leaves, which last were their summer habitations, these huts were Parhásas, or Parhicas, and Parnacas, Fornaces and Fornices. The Greek words Poçeviox, Poçevix, and Poçvn, seem to be derived from Parhéyam, a regular Sanscrit derivative, though never used. Prostitutes were thus called in Greek for the same reason that fornication is derived from fornix.

Mount Parnassus in Greece was probably thus denominated, from a Parháfa, which constituted the ancient temple, according to Pàusanias: it was made of branches and leaves; but as the word Parháfa signifies also any thing made of feathers or wings, others insisted, that formerly it consisted of the wings of certain bees cemented together with wax.

In the most secret recess of the temple of Vesta at Rome, there was a Parháfa or Parháfa fenced with leaves and branches, and it was called Penus according to Fèstus: as it was uncovered, it was really, what we call in English, a penn or fence: and, indeed, the word Parháfa, properly pronounced, sounds very much like Penus.
In the same manner, the word Pátrá a leaf, or Páttá, as it is pronounced in the spoken dialects, has found its way into Latin, in the words Patera, Patina, Patena, and Petasus: this last being used to signify equally the covering of the head and of a house, which were originally made of leaves and branches, and to this day, in India, by the poorer sort of people. The Pateras called Pátrá in Sanscrit, or cups used in sacrifices, are often made of a large leaf, folded up, and kept together with four wooden pins; utensils made of leaves are still used by the Hindus at their meals, and the Greek word Petra-lon is obviously derived from it.

The word Parhásā, or Parhásus, was not unknown in the west, at some early period: but as it belonged to the language of the gods, there was another word prevalent in the vulgar or profane languages, and used in its room. This word is Larna or Lar, which is found to this day in the Galic language, and that of the Cymri, as well as in Greek; in which last however it appears to be obsolete: but either in its original form, or through its derivatives, it is susceptible of the various acceptations of the word Parnásā; and this accounts for Larnassus being also the name of mount Parnassus.

Larco, Larnax signified a basket of twigs, and a chest: Lariethos any covering of bark. In Greek Laura, Lauran, signify, a house, an hermitage; also an assemblage of such houses. Lar, in Latin, is a house in Galic; and in the dialect of the Cymri, the ground floor. The original name seems to have been Larna, which was pronounced in different countries, Lar and Lan, like the Sanscrit word Parna, of which, by dropping either the r or the n, they make either Para, or Pana, in various dialects of India. Hence Llan in Galic signifies a house: Llan in the dialects of the Cymri, an inclosure. Thus, were the household gods called indifferently LARES and PENATES.
The words Lar, Larna, Parná and Pátá were once used indifferently in the west, to signify a pen or coop; and swine confined in them for the purpose of fattening, were called from that circumstance Larioni, and their flesh, Laridum, Perna and Petafo.

The word Lar or Lúura, is still used in Galic (Loar or Lembar), and in the dialect of the Cymri, Lhueru to signify resplendence, and probably from the last are derived the words glare, clear, &c. It is applied in Greek to resplendent metals, as gold and silver; also to the Laurus, or laurel tree, sacred to the author of resplendence. Daphne, another name for the Laurus, is derived from the Sanscrit Tapana, a name of the Sun, as the author of heat: for that place in Egypt*, called Tapana in the Puránas, is called Taphnai; by the seventy interpreters; and Daphane or Daphne, by Greek and Roman authors.

Though these mountains were in general called Par-naffian, yet the appellation of Parnaissus or Parhósa, belonged properly to that single mountain, on which stood the Parhasíla, or Parhósa, of Atri or Idris; this was, I suppose, his summer habitation, for he had below a Samach'b, in which, it is said, he lived occasionally.

It is declared in the Puránas, that when De'va-Nahuša, always pronounced Deo-naush in conversation, and in the vulgar dialects and obviously the Dionysius of the Greeks, conquered the world, he visited the seat of his grand ancestor Atri on the lesser Meru; and being uneasy to see it thus neglected; he sent for Visva-carma, the chief engineer of the gods, and ordered him to build on the spot a superb city, which he called after his own name Deva-Nahuša-nagari; which is accurately rendered Dionysiopolis in Greek.

It is called also simply Nabushham, Nabushá and Naujhid, from which the Greeks made Nyfa: and, as the word Nabushá is pronounced Nagush in several dialects of India, particularly in the Deekan; we find it also called Nagaz, as in the life of Amir Timur: but it is not to be confounded with Nughz in the Ayeen Akbery; the true name of which, is Bughz or Bughzán, the capital city of the district of Iryáb near Cabul. Nabushá is better known in Hindustan by the emphatical appellation of Dévá-Nagari, or the divine city. It was called also, but within the limits of that country only, Nagára or the city.

Since the destruction of the original city, the capital of that district, whatever it was, went also by the name of Nagara, which was successively applied to Adinagara and to Jellálábád.

The district of Nagara is called, in the Ayeen-Akbery and by the natives to this day, Nekier-bur, for Nagarwára, or the home district of Nagara.

Not a single vestige remains now of the ancient Naujhid or Nyfa; but the stony base of Meru, has resisted the ravages of time, and the corruptions of the river, which flowed formerly to the south of it.

The Sun and Dionysius were worshipped there, and Devi, or the Earth, had a cave sacred to her.

There is a striking similarity between the Grecian Parnasus and this mountain. The original temple at both places was an humble Parhása: at both places the Sun, Dionysius, and the Earth were worshipped. Mount Parnasus in Greece was full of Samach'hes also. It had two summits, one of which was called Nyfa, as well as the adjacent city; and the other Cyrrba or Cyrrhan.
Cyrrhan in the oblique case: this was sacred to the Sun. The words Cyrrha and Kirros seem to be derived from the Sanscrit Cirāka, which implies irradiation and resplendence. The most ancient oracle, and place of worship at Delphos, was that of the earth, in a cave, which was called Delphi; an obsolete Greek word, synonymous with yoni in Sanscrit: for it is the opinion of devout Hindus, that caves are the symbol of the sacred yoni: this opinion prevailed also in the west; for perforations and clefts in stones and rocks were called Cunni-Diaboli by the first Christians, who always bestowed the appellation of devils on the deities of the heathens. Perforated stones are not uncommon in India; and devout people pass through them, when the opening will admit of it, in order to be regenerated. If the hole be too small, they put either the hand or foot through it, and with a sufficient degree of faith, it answers nearly the same purpose. One of the seven wonders of the peak in Derbyshire, is called by a coarser name still, but very improperly; for this wonderful cave, or at least one very much like it, in the Sacred Isles, and particularly noticed in the Purānas, is declared to be the sacred yoni. The cleft called Gubya-śhān in Nepāl, answers fully and literally to the coarle appellation bestowed upon the other in Derbyshire by the vulgar, and is most devoutly worshipped by numerous pilgrims from all parts of India.

According to the opinion of my learned friends here, it is probable, that whenever puja was performed in honour of Prīthivi, or the Earth, the navel of Vishnu, or sacred umbilicus of white marbles kept at Delphos, in the sanctuary of the temple, and carefully wrapped up in cloth, was placed in the cave of Delphi. By the navel of Vishnu the Hindus understand the Os Tinea*.

From the similarity between the Parhāśa of India,

and that of Greece, it is natural to suppose, that the rites and ceremonies, were carried from the more ancient, to the modern one: the Indian Parhāsa is evidently the more ancient: for when Deucalion went into Greece, Dionysius and Apollo were not worshipped on mount Parnasus: he found there only the oracle of Themis. As Deucalion was sovereign of the country, in which the Indian Parnasus is situated, it is, in my humble opinion, highly probable, that he carried into Greece, the worship of the deities of his native country, and more particularly that of Dionysius; though I must confess, that it is positively asserted in the Purāṇas, that Deva-Nahusha visited the countries in the west; and there built cities called after his own name: he gave also his name to rivers, and particularly to the Danube or Ister, which, according to the Purāṇas, should be spelled Íster. His route is thus described in the Purāṇas: he first descended from the elevated plains of little Bokhara with a numerous army, and invaded the countries of Samarcand, Báblac, and Câbul, which were then inhabited by the 'Sacas and 'Sacasenas: he conquered afterwards Iran, Egypt, and Ethiopia; and proceeding afterwards through the dwīp of Varāha, or Europe; he conquered Chandra-dwīp, or the British islands: he went thence into Curry, which includes the northern parts of Europe, and the whole of Siberia: having conquered China, the countries to the south of it, and India, he returned to the plains of Meru, through the pass of Hardwar.

The Greeks supposed that mount Parnassus was the favourite abode of the Muses. The Hindus have not limited their residence to any particular spot: but as the Sun is their leader, they are supposed to accompany him.

They are called Rasa in Sanscrit, in which language this word signifies juice in general, but is more particularly understood of the honied juice of flowers: it implies also any thing which we particularly delight in.
There are nine of them, divided into three classes: and this accounts for the Greeks supposing that there were, originally, but three muses.

These three classes relate to love, war and religion.

First Class
1. Śrīṅgārā adorned with jewels: called also Śhuchī neat; and Ījewalā shining white.
2. Hāṣjā, Hāṣā, Hafā; all implying laughter.
3. Carahā, Caruviyā, Granā, Grañā, Anucampā, Anucrañā, all implying a merciful disposition, and tender pity.
4. Raurā and Ugrā, grief and rage accompanied with tears: despair.
5. Virā or Uśtwahā-wardanā: heroick: inspiring with courage.

Second Class
6. Bhayānacā, Bhayancarā, Pratibhayā, Bhairava, Bhīshmanā, Dāruhā, Bhīshmā, or Bhimā, Ghorā; all these names imply, fear, horror, hardness of heart, reciprocal dread, &c.

Third Class
7. Vibhatā or Vicratā; trembling with fear at the sight of scenes of cruelty, or at the recital of heavy misfortunes.
8. Adbhutā or Vismayā, Chitra Asbaryā: wonder and admiration.
9. Shantā is when we have effectually extinguished our senses.

Vibhatā and Adbhutā relate to that state, in which are virtuous people; who, without renouncing the world, enjoy its lawful pleasures; cautiously avoiding vice and guiltiness. Shantā is adapted to the state of a person, who, wishing to be reunited to the Supreme Being, considers virtue in the light
light of vice, because it implies attachment to the world. This is seldom used; hence it is, that many reckon only eight Rasas or Muses. Worldly, or common singers are forbidden the use of this, and even according to some, that of the seventh and eighth.

The ancients, according to Macrobius, entertained nearly the same idea, with respect to the Muses. Divines, says he* reckon nine Muses, eight of which answer to the musical sounds of the eight sphæres: the ninth, which is the most perfect and sublime, they consider as an harmonical concord resulting from the eight former. Macrobius insists that this idea is as ancient as Hesiod. The Hindus likewise consider Shantá as resulting from the simultaneous cadence and united powers of the others: and as Shantá is never used in worldly concerns, they often reckon eight Rasas or Muses only. The nine Rasas are represented as beautiful damsels, with peculiar attributes and dresses.

Pierus the son of Magnus, whose great-grandfather was Deucalion, introduced into Greece the nine Muses: and the old uncouth music of the Greeks, which consisted only of four Muses, was laid aside, it seems; but not without violent struggles on the part of the adherents of the old Rhythmica.

Deucalion is called Ca'la-Yavana in the Purans, but Ca'lyu'n and Ca'lju'n in conversation, and in the vulgar dialects. Though acknowledged of divine extraction, and of course entitled to the epithet of De'va; it is never bestowed on him, because he presumed to oppose Críshna: and, indeed, he was very near overpowering him. But, as

* Macrobi. in somn. scip. lib. 20, c. 30, p. 88.
his descendants gave him his right as to the title of De'va, and decreed divine honours to be paid to him, we shall henceforth call him Deva-Ca'la-Yavana, or, according to the vulgar mode of pronouncing this compound word, De'o-Ca'l'-Yun, which sounds exactly like Deucalion in Greek.

His father was the famous Garga, whose story is thus related in the Bhavishya-puraná. Sada'Siva-Maha'-de'va, is a great penitent (Yogi): he continually walks in the path of knowledge: having dedicated himself to the service of Vishnu (here is understood the supreme being in the character of Vishnu), he was constantly thinking on him. They, who devote themselves to the worship of Vishnu, have no occasion to worship the other gods: for there is no god like Vishnu, who is the original soul, and the ancient of days. Whoever devotes himself to him, obtains a seat at the most excellent feet*, he has no beginning, and he never dies: he is pure and incapable of decay: he bestows knowledge, and everlasting bliss: hence he is particularly to be worshipped. Maha'-de'va well knowing that Vaicant'ha (Vishnu) was to be born of the Vrishnis and Andhacas, said, I shall be his Purohita (or officiating priest): and he was born of woman, in the character of Garga: as soon as Críshna was born, Garga acted as his Purohita: hence he is called Garga'cha'rya: he gives Urdha (command over lust), and, though concealed under a mortal form, he is really Maha'-de'va. Garga is positively asserted here to be Maha'-de'va himself, who is called also Pramat'he'sa or the lord of the five senses or servants: because they are to be kept in due subjection to reason. Hence

* This expression is still used at the court of the great Lama, who is an incarnation of Vishnu.
the western mythologists gave out some, that D'eo-Caly'un was the son of Jupiter, others of Prometheus. Garga was a famous astronomer, being Maha'-de'va himself; and the same is asserted of Prometheus, who generally lived in Scythia, in which is situated the peak of Caliasa the abode of Maha'-de'va. Lastly, Prometheus is said to be the son of Japet, the Jya-pati of the Hindus; and it is very probable, as we have seen in a former essay, that Jya-pati was an incarnation of Maha'-de'va, or Maha'-deva himself. The Greek mythologists were little acquainted with the numberless incarnations found in the Purânas, but suppose the Avâtaras and Avantaras to be the offspring of the parent deity, according to the usual course of nature.

The history of D'eo-Cal-yu'n is thus related in a well-known poem called Hari Vansa. Garga was the spiritual guide of the Vrishnis and Andhacas: at an early period he became Brahmachâri, and had such command over himself, that he never longed after woman. One day, before a numerous and respectable assembly, king Shala reviled him, and asserted that his continence proceeded merely from incapacity. The sage irritated at this reflection, withdrew from the world, and performed religious austerities for twelve years, during which time he subsisted entirely on filings of iron. Maha'-de'va being pleased granted his boon, that a son should be born unto him, who would reunite in himself all the energy of the Vrishnis and Andhacas; and that they should never prevail against him. The sovereign king of the Yavanas, having no children, and hearing of this boon, went to Garga; and after many entreaties prevailed on the sage to accompany him into his kingdom: there he brought him into a Góshu, or hut made of leaves and branches, and placed
placed round him many shepherdesses; the holy man fixed his choice on one of them called Gopāli-apsarasa: she retained his seed against her will, and in due time was delivered of a boy at Gazni. Here I shall observe, that this apsarasa, or celestial nymph, having misbehaved at the court of Indra, was doomed to live on earth, for a certain time, in the character of a Gopāli or shepherdess. This punishment is often inflicted on them: and whilst on earth they generally prostitute themselves to the handsomest men; but always destroy the embryo as soon as possible. In this however the Gopāli-apsarasā did not succeed, because Garga was of a superior nature, being an incarnation of Maha'deva. The king of the Yavanās brought up the child in his own place, and adopted him for his son: after his death Ca'la-yavanad succeeded to the throne. He longed after the strife of war, and having asked the most respectable Brāhmens; which were the most powerful tribes in the country; Na'arda pointed out to him the Vṛshnis and Andhacas, Cal-yun being joined by the Śācas, Daradas, Paradās, Tangáns, Chaśas, and all the petty tribes of robbers, inhabiting the skirts of the snowy mountains, advanced against Mat'humā. Črīshna having heard of Maha'-deva's boon, was greatly alarmed; and attempted to enter into a negociation with Cal-yun, but his overtures were rejected. He then convened his friends and relations; and having declared to them in a few words, the critical situation they were in; represented to them that they had to time to lose, advised them to leave Mat'humā, and retire with him to Dvaraca in Gurjurdésa (near point Jigat). He informed them also that Jara'-sandha (the most powerful prince in India at that time, and whose daughter had married (Cansa) at the head of the confederate kings, who had resolved to revenge the death of Cansa, was advancing with an immense
mense army. When Crīshna had seen his friends and relations safe at Dwaraca; he returned alone to Math'hrā; and presented himself before Ca'lyn, who rising from his seat in a great rage, attempted to seize him. Crīshna fled, and Ca'llyun pursued him as far as the cave in which slept the famous Muchu-cunda. It is situated in the Raivata mountains, which extend from Guzrát toward Ajmér. Muchu-cunda was the son of king Mandata, who lived in the Ćṛita-yuga or golden-age: having defeated and humbled the Daityas, the gods, out of gratitude, waited on him requesting him to ask a boon. The warrior, who was exhausted with fatigue, answered he wanted nothing but sleep, and wished he might sleep till the arrival of Crīshna, and that, whosoever should presume to awake him, might be destroyed by the fire of his eye. Crīshna, who knew that such a boon had been granted to Muchu-cunda, boldly entered the gloomy cave, and placing himself toward the head of Muchu-cunda, waited in silence the arrival of Ca'lyun. He soon arrived, and seeing a man asleep, struck him several times to awake him. Muchu-cunda opening his eyes, a flame darted from them, which reduced Ca'lya-vana to ashes. Crīshna went immediately to Dwaraca, and gathering his forces fell upon the Yavans, put the greatest part of them to the sword, and the rest fled to their native country.

The conclusion of the drama is certainly forced, ridiculous, and unnatural: it is more probable, that Deo-calyun seeing his army defeated, fled to his native country: and that, through shame and vexation, he withdrew with his family and adherents to Greece. This conjecture is supported by the testimony of Greek historians, who uniformly assert, that he reigned, and ultimately died in Greece. They
are not, however, agreed about his origin, some saying he was a Scythian, and others, that he was a Syrian.

Any catastrophe, general or partial, either by fire, sword, or water, is called in Sanscrit Pralaya: but this word in the spoken dialects is generally understood of destruction by water, and of course the Greeks understood it in that light; when speaking of the dreadful catastrophe, which befel the Yavanas and their leader Deo-cal-yun on the borders of India; and I cannot help observing, that Greece was a most unfavourable spot for a partial flood.

The Yavanas originally worshipped the sacred Yoni alone, which they considered as the sole author of their being; but learned pandits suppose, that, when we read in the above legend, that the king of the Yavanas adopted for his son an Avantara of Mahadeva; it implies also, that himself with his subjects admitted the worship of the Linga or Phallus. Be this as it may, Prometheus, Deucalion, and his mother Jodaimia, had altars erected to them in Greece.

Garga-sthan or the place of Garga, where he lived amongst cowherds, is fourteen coss from Cabul according to some pilgrims. I have not been able yet to ascertain its situation, with sufficient accuracy to insert it in the map. It is situated in the mountains, which, from this circumstance, are called Garga-sthan, and by Persian authors Gherghistan.

It was asserted in the Cabirian mysteries, that Prometheus or Pramathea had a son called Aetnæus.* Pausanias mentions his name only;
and says he could not divulge, what he had heard concerning these deities in the sacred recesses of the temple, without being guilty of a sacrilege. The name of this inferior deity is derived from the Sanskrit Aitne'swara or Aitne'sa for Aitna-isa. This god I do not find mentioned in the Puránas; but his consort Aitni'-de'vi, or the goddess Aitni', is repeatedly noticed in these sacred books. She resided in an island, the dimensions of which are declared to be thirty yojanas, or about 150 miles, an expression rather obscure. There on a high mountain vomiting fire, was the sthán, or place of the goddess Aitni': indeed the whole island is called Aitni-sthán, and has no other name in the Puránas. This obviously is Mount Ætna, and the island of Sicily, which was uninhabited, according to the Pauranics, on account of the dreadful eruptions of the mountain; the crater of which was considered as sacred according to Pausanias.* The island (or tract of islands) of Lipara is mentioned also in the Puránas in which it is declared, that the appellation of Lay-a-para is derived from Para-Laya; because they who threw themselves into the volcano, obtained Laya, or reunion to the supreme being. It is said to be ten yojanas or fifty miles distant from Aitni-sthán or Sicily.

Aitni'-de'vi is obviously the nymph called Ætna by the Sicilians: she was the mother of the Palici, whose father was Jupiter with the title of Adramus, supposed with good reason by the learned to be the same with their Babylonian Adram-melech, whom I mentioned in a former essay on Semiramis, Adramus is obviously derived from the Sanscrit Adharme'swara or Adharme'sa: Is'a, Is'wara in Sanscrit; Melech in Chaldean, are synonymous; and the lord Adharma is an epithet of Siva.

* Pausan Lacon, p. 107.
HAVING discovered some years ago, that Prometheus, as a title of Siva, was not unknown to learned pandits, I immediately enquired after his cave or den, and related to my learned friends the legend of Prometheus and the eagle. They shrunk back with horror at this horrid blasphemy, and declared that none but impious Yavanas could ever suppose, that the deity could be fastened to a rock, and have its entrails devoured by an eagle. I was forced to drop my enquiries on a subject so disagreeable: but on considering lately, that the den was improperly called the cave of Prometheus; and that it should be rather called the place of the eagle; I enquired after Garuda-sthān, and was perfectly understood. They soon pointed it out to me in the Purānas and other sacred books, such as the Hari-vansa, the Casmir-mahatmya, &c. and I immediately perceived that it was situated in the vicinity of Cabul, where the historians of Alexander have placed it, and declare, that this hero had the curiosity to go and see it. I have discovered since a passage in a section of the Scanda-purāṇa, called the Himāchel-c'handa; in which it is declared that the sthān or place of Garud'a, is near Vāmbyan. It is related in the Hari-vansa, that, when Chrishna had occasion for Garud'a's assistance, to clear up the country round Dwaraca, which abounded with savages, ferocious animals, and noxious reptiles, Garud'a had then his place or sthān on the summit of a high peak of difficult access, in the country of the Yavanas, to the westward of the Indus; where he used to carry men and animals he could lay hold of, in order to devour them at his leisure. Unfortunately no further particulars could be collected from the Hindu sacred books, when a learned pandit recollecting, that as from an early period that country had been in the possession of the followers of Buddha, some light on this subject might naturally be expected.
expected from their books; after many entreaties, I prevailed on him to consult the learned of that sect: this he promised to do on condition that I would not make a practice of it. He found the Bauddhists equally averse to such communication. To be short, he produced at last a singular book called the Budha-dhármacharya Sindhub; in which we found the legends relating to Prometheus and the eagle, with many other interesting particulars. I beg leave here to retract what I said in a former essay on Egypt concerning the followers of Budd'ha*. There are many learned men among them, and they have many valuable books: it appears also that they have Védas and Puránas of their own. A comparison of them with those of the Brahmenical tribes would prove very interesting, and of the greatest importance. It would prove at first a very arduous undertaking, as it would be very difficult to gain the confidence of both parties.

Garud'a or the Eagle, called also Garutmat or the winged, lived in his own Van or forest, called from him Garutmat-van and Garutman-van. Bámíyan and the Mosaical Eden were situated in the forest of Garutman: and it is remarkable, that the Parsis, according to Anquetil du Perron, call the abode of the supreme being and of the blessed, Gorotman, which they represent as a terrestrial paradise. It is near Goraesha-van or Goricban, as it is pronounced in the vulgar dialects; but by Musulmans it is called Goor-ban and Goor-band. There he flew over mountains, through forests, searching whom he might devour, tearing up their bodies, and devouring their entrails. For Vishnu had given him this boon, saying, you may devour my enemies, and those of Siva; those who are guilty of constant uncleanness: the Nasticus, or unbelievers; those who deal in iniquity, the ungrate-

* Asiatic Researches, vol. iii, p. 412.
ful, those who speak ill of their spiritual guides, or otherwise behave ill to them, or defile their beds: all these you may devour: but do not touch a Bráhmen, whatever be his guilt; should you presume to devour him, he will prove a scorching flame in your throat; spare also my servants, and those of Maha'-De'va, and the righteous in general: for if you should transgress, your strength and power will be thereby greatly diminished. Vishnu having thus spoken, disappeared. Long after Garuḍ'ā spying a Bráhmen dressed like a Shabara, or mountaineer, laid hold of him, and attempted to devour him: but he soon felt a scorching flame in his throat, which forced him to disgorge the priest alive. Some time after he met with a servant of Maha'-De'va, who was rambling stark naked through the woods, and looked like an ideot: Garuḍ'ā sprung upon him; but found his body as hard as the thunder bolt. When Garuḍ'ā saw this, he carried his prey to his den, where he bound him, that he might devour him at his leisure: but he never could make the least impression upon him. The unfortunate prisoner called on Maha'-De'va, who sent Haraja to rescue him. Haraja or Harā-cula requested Garuḍ'ā to release him, saying, you are the chief of birds, this man is a favorite of Maha'-De'va, you also are a favorite of his, set him at liberty, or come and fight me. For a whole month they fought, when Garuḍ'ā's strength failed him: he saw then, that his prisoner was a servant of Maha'-De'va, and recalled to his mind, the words of Vishnu. He then set him at liberty, observing to Haraja, that in his life he never found so tough a subject.

The situation of Goracsha-van is well known to the Hindus; and I have seen many pilgrims, who have visited this singular spot. Near it, in the mountains, according to the sacred books, is situated the forest and place of Garuḍ'ā: there it was visited by
by Alexander and his Macedonians. I was not fortunate enough to meet with pilgrims, who had seen this place, which I understand, is seldom visited on account of its being difficult of access; and because few and trifling indulgences only are to be obtained there. They generally place it near the pass of Shabara, which was thus denominated from the Shabars, whom Garud'a used to devour. The word Shabara is interpreted in glossaries, Shâlivastra, and Vastracâra, and signifies such uncivilized race of men, as make, and wear for garments, a sort of matting made of grass and roots. The Shabara, whom Garud'a confined in his cave, was a servant of Mahâ'-de'va: a synonimous term for which, is also Pramathâh or Pramathas, whom the Greeks have confounded with Prometheus, obviously derived from the two Sanscrit words Pramat'ha-is'a, which coalescing according to the rules of grammar, form Pramat'he's'a. This supposed adventure is posterior to Crîshna: for in his time Garud'a was in the full enjoyment of his strength and power.

Garud'a is often represented as a Griffin, and the native country of the Griffins is placed by western mythologists in Bactria: this is also countenanced in the Puránas, and we read in the Himáchel-c'hand, that Garud'a and his brother Arunâ, who now drives the chariot of the Sun, went into Bactria and made Tapasya, at a place called Vimalamu, close to Vâmiyan, and near the oracle of Uma or Umasa, which is a name of the Earth, considered as the Magna-mater, and, perhaps from it, is derived the Latin word Húmer. There he married a beautiful woman; the snakes alarmed at his marriage, waged war against him: but they were defeated, one only escaping the general slaughter: who falling at the feet of Garud'a, said, devour me
me not, spare me, ो! Nāgāntaca, or destroyer of snakes. Garudā granted his request, and placed him by way of ornament round his neck.

Bactria was also the native country of the Sacas and Sacasenas; and it is remarkable, that wherever the Sacas went, there we find also the Griffins.

It appears, that at an early period some emigration took place from Bactria into Colchis, the inhabitants of which country were called Indi and Sindi. There was a powerful tribe called Augoi, Augōn, Abasgoi and Abasgōn, which appear to be the same with the present Afghans or Augans, called Aspagonae by Pliny. These carried with them their original legends, such as the story of Prometheus and the eagle; and in the course of time they even supposed, that the events they alluded to, did really happen in the country they were now inhabiting. According to the Purānas, the Sacas and Sacasenas, leaving Bactria, went into the dvip of Placsha, or Asia the lesser, which was afterwards denominated from them the dvip of Sāca. The appellation of Placsha or Placya in the vulgar dialects, was not entirely lost in the time of Herodotus, who takes particular notice of a place called Placia, the inhabitants of which, and of the adjacent country, still retained the old language. As the word Placsha is sometimes written Lacsha, I suspect that the Legzi or Legi, formerly a powerful nation in Colchis, were the remains of the ancient inhabitants of the dvip of Lacsha or Placsha: for they lived formerly in the more southern parts of lesser Asia, toward Syria, and were the same with the Leuco-Syri, perhaps for Lesgo-Syri, or Lachya-Syri.

Deo-Cal-yun, the adopted son of the lord paramount of the Yavanas, lived in the country of the Cāmboj,
Camboj, to the westward of the Indus. This is the same country, which, according to the learned, is now called by contraction Caj. As the vowel is very short, and of course obscure, every one of the five vowels is indifferently used; thus we have Caj, Kij, or Kidge, &c. In the same manner the name of the country called Camis, Camus, and Cambis, to the south of the Caspian sea, is often written and pronounced Caus. It includes all that mountainous tract, which extends from Gazni to the sea, and comprehended the countries known to the Greeks by the names of Arachosia and Gedrosia, written also Kedrosia; indeed, these two denominations signify the same thing, the mountains of Caj: for Roh in the language of the Balloches signifies a mountain, and may be placed, either before or after, thus Caj-Roh, Kej-Roh or Kedrosia; Roh-Caj or Arachosia. When they speak of the country in general, they say Caj only: and when they use the word Roh it implies the mountains of Caj. The appellation of Caj is now restricted to that part which is included in the province of Macrán or Mackrán, called by the Greeks Macarene; the chief river of which, was the Maxates, now called Macshid (*). Gazni, the true name of which is Sasni, was once the capital city of that country; hence it is called with propriety S'asni-Caj by Tavernier, or Chakeni-couze: the Pattans generally use k for sh; and very often also for s; thus they say, Pirkhowr for Pirshowr, Khehr for Shehr, a city. Gazni is called Sasni by Chrysoccoras; and Shasni or Chasenee, in Thevenot's collection of voyages. The present name is Gazni or Casni; but in the time of Tavernier, they said also Sacni or Jacni.

Roh-Caj, according to the Balluch pronunciation, or Row-Coz, as softened by the Pattans, is the Arachosia of the Greeks; which includes the districts

* Step. Bizant advocem Alexandria.
of Gazni and Candahar. Arachosia is now called Cawer or Cawerdan: but even this appellation is becoming obsolete. The river Arachotus called also Choaspes, and Cophes is now called Abek-Tārnīc, or the river Tārnīc. It rises in the hills to the north by east of Gazni; and after having watered the whole valley of Arachosia, it loses itself in a marsh about four miles to the south of Candahar: and when the rains are abundant, part of its waters run into the Arghand-ab, which falls into the Hir-mend. One of the emperors of Gazni had its waters dammed up in the hills, above that city, which are let out occasionally to water the fields, in which it is lost: when the rains are copious, the superabundant waters form a small stream, which reaches as far as Carabaug; and afterwards forms in some low grounds to the south east, a small marsh or lake. The present river Arachotus, is formed by a small stream, which rises a little above Mucur in the above marsh: hence it is often called the water of Mucur.

It was called Choaspes, or rather Cho-Asp from the following circumstances. Between the cities of Zuffā and Kālā-āt (a plural form implying towers or forts), there is in the bed of the river Tārnīc a deep hole, supposed unfathomable; called in the language of that country Sup, in Sanscrit Gopa, and in some dialects Gophā, from which, probably, are derived the words Γοτός and Κοπή, Coop, Cave, Cuve, and in Latin Cavus and Cavea, a Cave, a Coop, or Cage. An unwary traveller, riding upon a mare great with foal, stumbled into it and both were drowned. During the struggles the mare brought forth a foal, who was received by the fairies residing in this cave, and nursed by them. He is often seen grazing on the banks of the river, and at other
ON MOUNT CAUCASUS.

other times his head only is seen above the waters; from that circumstance the surrounding hills are called Sereh-Asp, or the horse’s head. As the foal was grazing one day in the adjacent meadows, he was seen by a traveller, who admiring his shape, laid hold of him and rode him for a long time; when returning the same way, he did Jelo-rez, or relax the reins, the horse ran away, and jumped into the cave, or hole. From the circumstance of his relaxing the reins, the surrounding hills are also called Jelo-rez. They might be called with propriety Coh-Asp, or the mountains of horse: and they were thus called once, or Cho-aspa as it appears from Ptolemy, who has applied this appellation to a city in the vicinity, but with greater propriety called Cophes by Pliny; a word obviously derived from Gopa, Gopha pronounced in different dialects, Cup and Sup, Cuph and Suff, or Zuph. It is called to this day Zuffa- or Shehr-zuffa, the town of Zuffa. It is called Zupha in the Peutingerian table, in the road from Fuciana (Fusheng), to Asbána, or Cabul. The marsh, to the south of Candahar, is obviously the Arachosian marsh of the ancient geographers. The ancient kings of Gor were natives of Zuffa, or Zuf; and gave that appellation to Gor, the place of their residence, but now desolate: the place where it stood is called Gor-moshcán.

Ptolemy mentions a town called Arachotus: but surely Roh-Coj could not be the real name of a city, which probably was Coj-vára, or Cojhar, Cojwár, and Cajuhr: it is the Kodzar and Kozdar of Persian authors; literally the habitation in the country of Coj, and, by implication the capital city of Coj. The kings of the Yavanas, and Deo-ca’l-yun re-

* Jelo-rez kerdun in Persian, signifies to relax the reins.
† This marshy lake it mentioned by Tavernier.
sided at Sasni, (now Ghazni), which word in Sanskrit signifies command, and by implication, the seat of empire. They generally pronounce this word Ghazni; because, it is said to be derived from Ghèzz-ni. *Ni* is foundation, and Ghèzz is the Tamarix, which abounds in that country. For they say, that, when the Musulmans invaded that country, being surrounded by an immense host of Càfirs, or unbelievers, they made a tumultuary rampart of loose earth, and tamarix; from which circumstance the place was called ever after Ghèzz-ni.

By a strange mistake, the country of Arachosia, and the river which flows through it, have been placed by the learned Danville, to the south of Candahar; had this famous geographer recognised Gazni, in the Shakeni-Couze of Tavernier, this mistake, I believe, would not have happened. I have had the satisfaction to converse often with natives of Candahar, of Kálá-át-Násir-Khan, and Cojhur, and other intermediate places; and have obtained sufficient local knowledge of that country, to rectify this error. Kálá-át-Násir-Khan is the Kálá-Berlook of the Ayeen-Acery; it is also the Al-Casr of the Nubian geographer, a word of the same import with Kálá-át a plural form. It was surnamed Násir-khán, from its last governor, who died some years ago. In its vicinity is the town of Sorra mentioned by the Nubian geographer; it is better known by the name of Sorra-Bac or Sorra-Beyck. Beyck is a name common to several places in that country: they are situated among mountains denominated from them, by Ptolemy. Becii or Baieii montes, as we read in Mercator’s maps; or Baitii in the original: for in ancient manuscript, *t* and *c* are often mistaken the one for the other. In the Puranas they are called Su-Bhaæsha. The real name of Gaznì was originally Sabul, Zabul, or Saul, as it is written
written by Chrysococcas: hence it appears to be the Ozola of Ptolemy. It is probably the Oscanidati of the Peutingerian table, twenty-two farsacks from Asbáná or Cabul; and thirty-five from Zuyha Oscanidati is perhaps corrupted from Sacni-tut, or the mulberry grove of Sacni. Tut in the Pashto, as well as in the Persian and Hindwi languages, signifies a mulberry. In composition, it implies a mulberry grove. This tree grows spontaneously in that country, in the plains: and the Pattans generally pitch their tents, or erect their huts near groves of it. Its fruit is exquisitely delicious: and we often hear Pattans in Hindustan sighing after their mulberry groves, wishing to die under their shades.

The famous peak of Chaisá-ghar, which we mentioned before, is situated on the road between Gazni and Derá-Ismáhil: the Musulmans call it Tuct-Suleiman, or the throne of Solomon; and to the adjacent mountains they have given the name of Coh-Suleiman. It is seen at the distance of one hundred coss, and begins to be visible near the extensive ruins of the famous city Sángalá about sixty miles west by north of Lahore. Sángalá is situated in a forest, and though desolate and uninhabited, it preserves still its ancient name. It was built by the famous Puru or Purus, great grandson of Atri. It is called Sinkol in Persian romances, and its king, raja Sinkol. It has been confounded by Arrian with Sálgalá or Sálgadá, which is now called Calanore; close to which is still an ancient place called Salgéda to this day, and its situation answers most minutely to Arrian's description. Sálgalá and Sálgadá, are two derivative forms, the first is Sanscrit, and the second is conformable to the idiom of the dialects of the Pánjáb. The summit of Chaisá-ghar is always covered with snow; in the midst of which are seen several streaks of reddish...
a reddish hue, supposed by pilgrims, to be the mark, or impression made by the feet of the dove which Noah let out of the ark. For it is the general and uniform tradition of that country, that Noah built the ark on the summit of this mountain, and there embarked: that, when the flood assuaged, the summit of it first appeared above the waters, and was the resting-place of the dove, which left the impression of her feet in the mud, which with time, was hardened into a rock. The ark itself rested about half way up the mountain, on a projecting plain of a very small extent. There a place of worship was erected, near which is a caldron of copper of such dimensions, that one hundred maunds of food may be dressed in it at the same time. Near it is an hermitage inhabited by several Derweishes, and a little above, is a flag. The inhabitants of the country resort there occasionally on Fridays. With respect to the foot-steps of the dove, they are known only by tradition, for the inhabitants of that country assert, that they have never heard of any body going up so high on account of the ruggedness of the mountain, and of the snow. The Bhaudhists, who were the first inhabitants of that country, are, I am told, of the same opinion as to the place where the ark rested; but hitherto I have been able to procure a single passage only, from the Buddha-dharma-chárya-Sindhuh, in which it is declared that Shama or Shem, travelled first to the north east, and then turning to the north west, he arrived on the spot, where he built afterwards the town of Bámíyan. Shama they say, having descended from the mountain of Chaisághar, travelled north east, as far as the confluence of the Attock with the Indus; where he made Tapasya: he then proceeded north west to Bámíyan.

The Pauranics insist, that, as it is declared in their sacred books, that Satyavrata made fast the
ark to the famous peak, called from that circumstance, Nau-bandha, with a cable of a prodigious length, he must have built it in the adjacent country. Nau (a ship) and bandha (to make fast), is the name of a famous peak situated in Cashmir, three days journey to the north north east of the purganah of Lar. This famous place is resorted to by pilgrims, from all parts of India, who scramble up among the rocks to a cavern, beyond which they never go. A few doves frightened with the noise, fly from rock to rock: these the pilgrims fancy to be their guides to the holy place, and believe, that they are the genuine offspring of the dove, which Noah let out of the ark, at all events in the numerous legends, which I have extracted from the Purañás relating to Sātyavrata and the ark, no mention is made of his letting out the dove: the whole story I shall give in abstract. Sātyavrata having built the ark, and the flood increasing, it was made fast to the peak of Nau-bandha, with a cable of prodigious length. During the flood, Brahma or the creating power was asleep at the bottom of the abyss: the generative power of nature, both male and female, were reduced to their simplest elements, the Linga and the Yoni, assumed the shape of the hull of a ship since typified by the Arghá; whilst the Linga became the mast.* In this manner they were wafted over the deep, under the care and protection of Vīshnu. When the waters had retired, the female power of nature appeared immediately in the character of Capotés'wāri or the dove, and she was soon joined by her consort, in the shape of Capotés'wāra.

The mountains of Coh-Suleiman are sometimes called by the natives the mountains of the dove: the

* Maha'-deva is sometimes represented standing erect in the middle of the Arghá in the room of the mast.
whole range as far as Gazni is called by Ptolemy the Parueloi mountains, probably from the Párvata or Párvát, which signifies a dove. The peak of Chaisa-ghar is called also Cála-Roh or the black mountain: the summit alone being covered with snow, is not always seen at a great distance; but the body of the mountain, which looks black, is by far more obvious to the sight. Persian romances say, that there were seventy or seventy-two rulers called Suleiman, before Adam; this has an obvious relation to the seventy-one Manvantaras of the Hindus: and of course Noah or Satyavrata was a Suleiman.

The followers of Buddha acknowledge that the ark might have been fastened to Nau-bandha near Cashmir; but surely they say, the ark could not have been riding perpendicularly above this peak, and such a vessel required a vast length of cable: in short though the cable was made fast at Nau-bandha, the ark was riding above Cháisá-ghar. According to the Pauranics and the followers of Buddha, the ark rested on the mountain of Aryawarta, Aryawart or India, an appellation which has no small affinity with the Ararat of scripture. These mountains were a great way to the eastward of the plains of Shinar or Mesopotamia, for it is said in Genesis, that, some time after the flood, they journeyed from the east, till they found a plain in the land of Shinar, in which they settled. This surely implies that they came from a very distant country to the eastward of Shinar. The region about Tucht-Suleiman is the native country of the olive tree, and I believe the only one in the world. There are immense forests of it on the high grounds; for it does not grow in plains. From the saplings, the inhabitants make walking sticks, and its wood is used for fuel all over the country; and, as Pliny justly
justly observes, the olive tree in the western parts of India, is sterile, at least its fruit is useless, like that of the Oleaster. According to Fenestalla, an ancient author cited by Pliny,* there were no olive trees in Spain, Italy or Africa in the time of Tarquin the eldest. Before the time of Hesiod, it had been introduced into Greece: but it took a long time before it was reconciled to the climate, and its cultivation properly understood: for Hesiod says, that, whoever planted an olive tree, never lived to eat of its fruit. The olive tree never was a native of Armenia; and the passage of Strabo, cited in support of this opinion, implies only, that it was cultivated with success in that country. But let us return to Sharma and his disciple Sarasala, the legends concerning whom are to be found in the Buddha-dharma-charya-Sindhuh.

"The chief of the followers of Buddha is endowed with knowledge: great are his riches and power. He shewed mercy to the living creation; and instructed them all in their respective duties: he was deeply skilled in the 'Sastras. He is the abode of human and divine knowledge, which he imparts to all. He, whose name is Shama, is the chief of living beings: he gives an increase of pleasure to every body: he travels over the whole world, instructing every one in their respective duties. Once he went north east, then turning toward the north-west, he arrived at the Himani mountains. There he saw a variegated hill: it was beautiful: there were numerous springs: all sorts of animals and chirping birds. In this forest, he, whose name is Shama-Maha-Muni, began to perform Tapasya: for he saw that the country was Tapobhumi (land fit for the performance of religious rites.)

* Pliny B 12 C. 6.
2 L 3

"Here,
Here, says he, I shall soon obtain the end of my Tapasya. Jine'swara, the god of gods, was pleased: he granted his boon: Jine'swara, who is Bhagavan, for the good of mankind, granted his boon: from daya (mercy) comes ardra (softness of heart;) to do good to all men you were born! Before this he was famed as a good man; but when he had obtained his boon! As he lived in an uninhabited forest, pilgrims suffered much: through the efficacy of his Tapasya, he built a town, which he called Vaméyan: it was vámá (beautiful), hence it was called Vaméyan. Wood, grain, and grass, were in plenty. He placed beautiful flags on all the gates and posterns. He made also beautiful (chetwara) squares, where grain and wealth were displayed. He called in the four great tribes: gold and jewels abounded in their houses. In one house were often seen an hundred women, shining with gold and precious stones: here the drum beat: there they danced: every body was pleased. From the noise in every street, in every house, it seemed as if the whole town spoke. In every house there were constantly feasts and rejoicings: it was like the town of the gods. Shama instructed them all in their respective duties. In this city men and women follow the religion of Buddha, and nobody says there, why do you worship Buddha? Shama having thus obtained the object of his wishes, withdrew to an adjacent hill, where he erected a beautiful and strong building for his residence. He kept his internal indris, or senses, under subjection; hence he was called Shama. He is constantly performing the Yoga: upon a hill fit for such performance, he seated himself: there re-sides the chief of the forms of Buddha.” This hill is now called Ghulghuleh.

* So it is in the original: but it is understood, that, after he had obtained his boon, he was considered as a superior being.
"There is another image-like resemblance of Shama-Sharma in his disciple: he is constantly performing Tapasya; he studies daya (mercy), and observes most rigidly the dictates of justice. He waited with most scrupulous obedience on Shama, his spiritual guide. Lust had no power on him: in him were united human and divine knowledge: he became Paranishta (he dwelled in god) and great were the powers of his understanding. For ten years he made Tapasya, during which he left off eating and drinking: he felt no uneasiness on that account: he lived upon the winds: thus he kept up the efficacy of his religious austerities. He is a great penitent; constantly thinking on the deity. He did not make Dambha, that is to say, he did not perform religious acts for the sake of worldly praise. Thus he made a most rigorous Tapasya. Then Jina-Wara (or the lord of the forms of Jina) was pleased: Jina-Deva said; why are you making Tapasya? What is your wish? You have made a most rigorous Tapasya, even to the peril of your life: get up, get up: it shall be well with you: ask your boon? Rasa-La, such was his name, said, to day have I obtained the fruit of my labours: I have seen you: I have seen you! This is all I wanted: what is the rest to me! This was my only object and desire. I was like a poor man, who is oppressed; but on my complaining to you I have obtained redress: be merciful. Jina said your heart is like a beetle,* who constantly sticks to me: your name before was RasaLa (he who delights in the honied juice (Rasa) of flowers: now it shall be Sa-RasaLa (who delights much in it). All the world shall call you Sa-RasaLa:

* In Sanscrit Bhranga; in Greek Bruchos and Brucos; hence Sarasala is called Bhranga; and Dongus by Nonnus.
ask your boon. The Muni said he was nispraha he wanted nothing: only give me the end of my Tapasya: that I may go unmolested through the three worlds, and see you every where; let me also retain the efficacy of my Tapasya. O chief of the forms of Jina, this is my boon. Jina-va-ra who is Iswara, granted it, and disappeared. The son of the Raja kept up the efficacy of his Tapasya; and thus became Avyâhatawairagati he went every where unmolested: he became Sasmadracâ; friends or foes, men and women were the same to him. Such was his Tapasya, that he even surpassed his Guru Shâma; who, seemingly, became Spardhâ, saying why do you wish to surpass me. He endeavoured to spoil his Tapasya, and to corrupt his heart; but in vain. Still he waited on him with humility, without answering, without complaining. When Shâma saw this, he said with astonishment: he is a good man (Sadhu): his name then shall be Sadhu. Thus he obtained a boon from his spiritual guide. Sa-Ra-Sa'la is constantly making Tapasya thinking on Jineswara.

** Who is he, whom all the world call Sa-Rasa'-La? You are the chief of the Yatis: relate the whole to me. Who was he before? Why did he come into this forest? Why is he making Tapasya? Be exalted and relate the whole to me. The chief of the Yatis said: he is the king of the country of Calinga. He had forsaken the paths of righteousness, and dwelt among women, he was proud and his heart was fixed on them. He was like the Sarasâ*, like the beetle, who delights on the honied juice (Rasa) of flowers: hence he was called Rasa'la. Once in a former state,

* A bird of the crane kind.
"he performed a most meritorious action; which "proved afterwards of great service to him. Some "private business having brought him to Mat'hirá; "his friends prevailed on him to perform the usual "ablutions: he gave alms also. His heart was puri-"fied from guilt, and his iniquity removed. At that "time the chief of the Munis of Jīna (Shama) came "to Mat'hirá, and shewed to him the path to rec-
titude. He treasured up every word: acknowledg-"ing the truth, he was irradiated. From that "moment he held for nothing his crown, his wife, "his children, and his wealth. He disposed of his "effects among the Yatis, and having resigned his "crown to his son, and recommended his wife to "him, he withdrew to the forests. There he made "Tapasya, thinking on jīnavara. Thus I have "related the whole to you."

By Calinga, the Pauranics understand the sea coasts at the summit of the bay of Bengal, from point Godaveri to cape Negrais. It is divided into three parts. Calinga proper, which extends from point Godaveri to the western branch of the Ganges; the inhabitants of the country are called Colingee by Ælian and Pliny. Madhya-Calinga or middle Calinga is in the Delta of the Ganges, and is corruptly called Modo-Galinca by Pliny. Moga-Calinga extends from the eastern branch of the Ganges to cape Negrais in the country of the Migas or Mugs; this is obviously the Macco-Calingae of Plin-
y. Calinga implies a country abounding with creeks and is equally applicable to the sea shore about the mouths of the Inaus.

Shama, and his disciple Sa-rasa'la, are perhaps the same, who are called Sam and Zal-zer or Sal the white in Persian romances: certain it is that they lived in that country. The father of Sam was Neriman,
Neriman, which if a Sanscrit appellation, is very applicable to Noah: nere signifies a wave in Persian, and nara water in Sanscrit. Sam may be the same with Stamec the son of Key-Umurs; for Shamba and Sharmaca, Shama, and Shamca are various appellations of the patriarch Shem. As to Key-Umurs or king Umurs, it is a denomination given equally to Adam and Noah in Persian romances, and with great propriety, for Umarsa in Sanscrit signifies the lord of Uma, the female power of nature and the earth. In that section of the Scandal-purâna called the Himâchel-chanda, it is said that Buddha the ninth Avatâra of Vishnu appeared in the characters of Shama or Shem; by which we must understand, according to the learned, that Sharma an incarnation of Vishnu reappeared as Buddha. Indeed the character of Shrama is well preserved throughout: for this famous patriarch is represented of a most benevolent and mild disposition, with a very weak constitution. When Buddha was seven years above eight old, he was invested with the sacerdotal cord. He went immediately to Vâmigram or Vâmbyam in order to defeat the schemes of the Dalityas, who were assembled in its vicinity, to perform solemn sacrifices and the most rigid acts of devotion in order to obtain the dominion of the world. Vâmbyan is declared to have been at that time a most magnificent city. There the gods and many holy men were assembled in order to pay their respects to Vishnu and implore his assistance against the Dalityas. Buddha in the shape of a Samnyâsi presented himself to them, and was kindly received; he then told them, that every sacrifice of an animal was an abomination, and that even ablutions were wicked, because small insects might be killed by bathing. Such was his eloquence, that the Dalityas wept bitterly, abandoned all thoughts of sacrifice and ablution, and thereby were frustrated in their
their scheme of attaining the dominion of the world. After this memorable victory, great rejoicings were made throughout the whole town of Bāmiyān: for the Baudhāhists insist that the religion of BUDDHA existed from the beginning.

I cannot better conclude this essay than by making a few remarks on the supposed prohibition, imposed on every good Hindu from crossing the Indus; in order to obviate some objections lately started, against the possibility of their being acquainted with the most ancient transactions in the western parts of the world. This prohibition is certainly very ancient: for it is mentioned by Diodorus the Sicilian; who says, that king Sταυροβάτες, in Sanscrit Sṭha'wara-pati was prevented by the soothsayers, in consequence of certain prodigies, from crossing the Indus.

Before we proceed, it is proper to ascertain, what part of the Indus is properly called Attaca or the forbidden. From the unanimous report of the natives of that country, either Hindus or Musulmans, learned as well as simple, I am fully satisfied that the Landhī-Sindh, which rises from a lake in the vicinity of Bāmiyān, and falls into the Sindh above Attaca-Varanesa or Attock-Benares is the real Attock or forbidden river: this property however it communicates to the greater Sindh from the place of their confluence down to the sea. The Indus is called Sindhu or Sindhus in Sanscrit, Ab-Sind or water of Sind by Persian authors: but in the Pastoo language it is called Abai-Sin or father Sin. The waters of the Landhī-Sin, or lesser Sind, are remarkable for their limpidity: and being very deep, it gives them a dark azure appearance; whilst the waters of the Abai-Sin, are turbid: and above Tor-Belah or the black Bēlāh* toward Der-bend and

* Tor-Belā or Tor-Belam, thus called from the banks of black sand Bawersa
Bawersa they are of a milk white colour, from the immense banks of chalk in its bed. Bawersa called also Bawersa-da and Bawersa-di, is the Barisadis of the historians of Alexander*. Below Tor-Bélah or Tor-bélam, and its black sands, the waters of the Sind are blackish, between the high mountains about Attock and the fort of Nilab, the gloom increases much their black appearance. The Landi-Sín from the dark azure appearance of its waters is with great propriety called the Nil-ab: the inhabitants know of no other river distinguished by that epithet. They seldom, however, make use of it. At Goorband, it is called the Goor-band river; near Baran, the Baran river. Near Palanghur, the Pleygrium of Strabo, in the district of Cameh, it is called Cameh river. Gorydalis, mentioned by Strabo near the pass of Kheibar, is called now Gurdyáli, and Gurdeh: and Bando-Béna, is the band or dam of Béna or Béyanah, or rather it implies Béyanah near the band or dam, which, I suppose to be the royal wall in the country of Opianeh mentioned by Stephanus of Byzantium: it is near Peishhour.

Ancient geographers were as much perplexed as the moderns, with regard to the rivers, to the westward of the Indus. The Choaspes, and the Cophes, are represented as two distinct rivers: but I suspect that, like the river in Arachosia, the same river was in its vicinity; there probably Alexander crossed the Indus. Ac-Belam or Ec-Bolima was probably near Hazru, about half way between Tor-Belam and the fort of Attock, there are many banks of white chalk; from which, it was probably called Ac-Belam, or the white Belam.

* Bawersadi is a derivative form, from Bawersa, according to the idiom of the dialect of the Panjab, in which, as well as all over India, derivative forms are used in the room of the primitive: thus we say Bengal for Banga: thus the town of Nahusha or Nysa, is called Nisha-dapuram for Nisha-puram or Nisha-pur, in a fragment cited by Sig. Bayer.

called
called by two different names. The Choaspes has been also mistaken for the Cons of Ptolemys, which last comes from the country of Cash-ghar.

The appellation of Cophes, as we have seen before, is derived from the words Gopa or Gopha: and, though never used by the natives, yet, they assert, that this river passes, through an immense Gap in the mountains of Bámíyan, or in Sanscrit through a large Gopa or Gopha, from which the English words Gap, to Gape, and in German Gaffen are probably derived. Tradition is now silent with respect to the appellation of Choaspes: but we read in Ctesias of certain animals in this river, somewhat in the shape of river horses. This author calls it Gaitas; and it is the same with the Genidis or Geuthis of Nonnus; for Bacchus crossed this river in his way from Nicea, or Cabul, to the place of abode of the benevolent and hospitable Brongus among the Samach'hes of Bámíyan. On the bank of this river was the town of Alybe or Alyben in the oblique case* which is called to this day Elben and sometimes Elybend. It is at the foot of the mountains, near the entrance of a pass leading to Bámíyan.

The Gaitas and Geuthis being the same river with the Cophes, I strongly suspected that the two former appellations are corrupted from the latter. Of this we have a remarkable instance in the Greek and Latin languages. The words Cæpa and Cæpe in Latin or Gaipia, Gaiphu or Gephu, in old Greek, are pronounced and written in the more modern Gethua and Getia. Thus the tree called Tâla in India and also by Arrian, is written Tala by Pliny: thus the word Paulus is pronounced Taulus in the countries bordering on the Nile: and the materials from which

* Nonn. Dionys. lib. 17. v. 33, &c.

Nonnus
Nonnus compiled his Dionysiaca were originally written in these countries; of which Nonnus himself was a native.

The Hir-mend which has its source in the same lake with the Landhi-Sin, and flows toward Persia, is called also Attock, so that it seems, that the whole country between the Hermend and Indus, was equally Attaca or forbidden. I have not been able yet to discover the origin of this prohibition: but I believe it extended at first to civil purposes only. In this manner the Hara-Modren in China is called Attock by Hindu pilgrims, who do not consider it, in the least, as a religious prohibition: this civil prohibition is very ancient for it is recorded by Pliny*. The Máha-nadi near Cuttack is also called Attock, but this prohibition is very little regarded.

In that dreadful war which we mentioned in our former essay† between the Lingancitas and Yonijas or Yavanas: the former stood their ground pretty well at first: but were in the end defeated and shamefully routed in the battle, through the efficacy of the sacred Yoni, Mahâdeva enraged, was going to destroy them with the fire of his eye: but Păr-vati' interposed, and to appease him made use of the same artifice, the old woman called Baubo, did to put Ceres in good humour, and shewed him the prototype of the Lotos. Mahâdeva smiled and relented; but on the condition only that they should instantly leave the country. Whether this legend allude to a real war between the worshippers of the Linga and Yoni, or be a mere physiological allegory I cannot determine: be this as it may, the Yavanas withdrew to the countries between the Indus, and the Hirmand, and the Landhi-Sin or Nilab: every

* Lib. 6, c. 22. † Asiatick Researches, vol. 3. p. 362.
intercourse was forbidden on all sides: thus in my humble opinion, these three rivers were denominated Attaca or forbidden. The Yavans it seems were expelled afterwards with their chief De'o-cā'lyun by Črishna, and his brother Bala or Balas, the Indian Hercules, called also Belus. This I suppose was the Bactrian war alluded to by Nonnu's in his Dionysiacs. It was then that, Indian Hercules besieged in vain the famous fort of Aornos called also Avernum on the banks of the Indus. It has preserved its ancient name to this day being called Varunas or Benares: it is more generally known by the name of Attock. It was surveyed some years ago by my friend Mirza Mogul Beg, and his description of that famous place, answers minutely, to that given by the historians of Alexander, of the fortified rock of Aornos*.

There are four rivers, which were once much dreaded by a religious people according to the following text:

Carmanásá jala sparshát; Caratoyá vagáhanát;
Gandaci bāhuturanát: Sindho pārégumāltathá.
Evan carma Dwija curvan punah Sanscáram arhati.

By which it is forbidden even to touch the waters of the Carmanásá, to bathe in the Caratoyá (a river in Bengal called Curratya in the maps), to swim in the Gandaci, and to cross the Indus. The inhabitants of the countries on the banks of these rivers, claim however, an exemption, which is admitted by the rest of the Hindus: and on the banks of the Carmanásá live many Brāhmens who daily perform their ablutions in it, and drink of its waters; and to my knowledge they are not considered as defiled in the least: on the contrary they are in gen-

* To the north north east of Attock-Benares, about eighteen miles distant, is the town of Bazar near the western banks of the Indus: it is the Bazira of the historians of Alexander.
eral highly respected at Benares. The prohibition with respect to the three other rivers, has never been much attended to; but their aversion to the Carmanāśā is now as great as ever: by the contact alone of its baneful waters, pilgrims suppose that they lose the fruit and efficacy of all their religious austerities and pilgrimages: and they always cross it with the utmost caution. With respect to the Indus, my learned friends here agree, that the sin, if any, consists only in crossing the river: and that it by no means implies any prohibition to go and remain in the countries beyond it. Besides you may easily go to Bāmīyan without crossing any of the forbidden rivers, by crossing the Indus above its confluence with the Attaca: for in all the prohibitory laws, you may safely adhere to the latter. They informed me also that in the time of Aćbar, who greatly favoured the Hindus, the numerous bands of Rajpoots in his service, having been ordered to cross the Indus to chastise some refractory Pattan tribes, they informed him, that they were forbidden to cross this river. The emperor wrote to them, that the earth and its rivers were the lord's, and that the prohibition was of course more in their heads, than consistent with reason: however if they conceived in their hearts that it was improper to cross, by all means to abstain from it. On the receipt of this letter, the Rajpoots, with the Brāhmens who accompanied them, crossed the Attock immediately.

The numerous Brāhmens who live in Iran, cross it daily, without any scruple whatever, as well as those of Multan, and other adjacent countries. Those of Multan jocularly say, that, as the true bed of the river is not ascertained, they may cross it with impunity. The truth is that the Indus ran formerly a great way to the westward of its present channel, through the Nulla-Sancár, which branches out of the Indus be-
Dérá-Ismáhil. Mirza-Mogul-Beg surveyed it some years ago as far as the parallel of Multan, where his survey ended. But he was informed, that it ran a great way to the south in a direction almost parallel to the Indus, with which it communicates occasionally through the various branches. The Nulla-Súncára being the old bed of the Indus is of course considered as the true boundary of Indostan, and was admitted as such in the treaty of peace between Nádir-Sha’h and the emperor of India. This dereliction happened before Alexander’s time, as it was recorded by Aristobulus, according to Strabo.

I cannot help taking notice of a curious observation made by a learned Bráhmen, that whosoever prohibited the crossing of the Attock, meant only that no body making use of the usual modes known at that time, should presume to cross it: but if he could leap over it, or cross it in a balloon, or astride a wild goose, or any other bird, which may be effected through magick, there could be no harm whatever. This strange idea brought to my recollection a whimsical story of the Musulmans who inhabited the country of Sind or Tata: they fancy Alexander by magical art conveyed his whole army over the Indus, every man of his riding astride a wild goose. Alexander was pretty successful in India, they conceive that this would not have been the case if he had crossed the Indus either in boats or by swimming; and the most obvious method he could adopt, in their opinion, was to convey his soldiers in the above manner.

When the unfortunate Rághu-Ná’th-Rá’ya or Ragoba, sent two Bráhmens as embassadors to England, they went by sea as far as Suez, but they came back by the way of Persia, and of course crossed
crossed the Indus. On their return they were treated as outcasts; because they conceived it hardly possible for them to travel through countries inhabited by Mlec'h'has or impure tribes, and live according to the rules laid down in their sacred books: it was also alleged, that they had crossed the Attaca. Numerous meetings were held in consequence of this, and learned Bráhmens were convened from all parts. The influence and authority of Rághu-Ná' th-Rá' yá could not save his ambassadors. However the holy assembly decreed, that in consideration of their universal good character, and of the motive of their travelling to distant countries, which was solely to promote the good of their country, they might be regenerated and have the sacerdotal ordination renewed. For the purpose of regeneration, it is directed to make an image of pure gold of the female power of nature; in the shape either of a woman or of a cow. In this statue the person to be regenerated is enclosed and dragged through the usual channel. As a statue of pure gold and of proper dimensions would be too expensive, it is sufficient to make an image of the sacred Yoni, through which the person to be regenerated is to pass. Rághu-Ná' th-Rá' yá had one made of pure gold and of proper dimensions: his ambassadors were regenerated, and the usual ceremonies of ordination having been performed, and immense presents bestowed on the Bráhmens, they were re-admitted into the communion of the faithful. The two culprits made a very able defence, and had it not been for some irregularities at Jedda, where water is brought from a place about ten or twelve miles distant: it is the general opinion, that they would have been acquitted: for they were men of unexceptionable character, and of course they were to be judged in great measure from their own deposition, and declaration of all circumstances. In vain they pleaded necessity, and referred to the conduct of
of Visvamitra and other holy men as a precedent in such circumstances. It was answered, that such cases were inadmissible as precedents in the present age.

No such prohibition however, is mentioned in the Purānas, or in any of their sacred books of great antiquity. On the contrary, we see in the Purānas many holy men constantly crossing the Indus, and going even as far as the sacred isles in the west. There are Brāhmens to this day, and Hindus of all denominations crossing the Indus to visit the holy places in the west: but these persons have renounced the world, and retain but few practices of their classes. Though highly respected, yet no body presumes to eat, or communicate with them; but they go in crowds to receive their blessing. We have mentioned before, that Brāhmens, and other Hindus, living in the countries, on either side of the Hindus claim an exemption from all ecclesiastical censure, on that account; and though in general they are not much respected at Benares; yet their claim is admitted as good, and valid.
XIII.

ON THE ANTIQUITY

OF

THE SURYA' SIDDHANTA,

AND

The Formation of the Astronomical Cycles therein contained.

BY MR. J. BENTLEY.

1. THE Surya Siddhanta is generally believed to be the most ancient astronomical treatise the Hindus have, and according to their notions is supposed to have been received through divine revelation at the close of the Satya yug, of the 28th Maha yug, of the 7th Manwantara: that is about 2164899 years ago.

2. That the Hindus are an ancient people is generally allowed, and proved beyond a doubt by historical evidence; but that they are possessed of astronomical works, of such stupendous antiquity, as the Surya Siddhanta is pretended to be, is a circumstance not warranted by the strictest investigation.

3. Several of the learned have written on the laws, manners, customs, &c. of the Hindus, but it is only within a few years past, I believe, that attempts have been made to investigate, through the medium of their astronomical works, &c. the truth or falsehood of their pretensions to the high and monstrous antiquity they assume to themselves above all other
other nations. M. Bailly, in the year 1787, published at Paris, a whole quarto volume on the subject of the Indian astronomy; and Mr. Playfair, in the year 1789, published a paper on the same subject in the Edinburgh transactions. The principles, however, of the Hindu systems of astronomy, being unknown to these gentlemen, and differing widely in many respects from that of the Europeans, the conclusions drawn by them respecting the antiquity of the several astronomical tables mentioned by Mr. Bailly, appear now to be altogether unfounded. Indeed, the materials which Mr. Bailly had collected*, were insufficient to enable him to form a just idea of the principles of the Hindu systems, which being mostly artificial, his method of investigation (from the quantity of the mean annual motions, &c. of the planets, though otherwise perfectly just) became altogether inapplicable; so much so, that the tables of Trivalore, which he had supposed were as old as the commencement of the present Cali yug, at least, were actually written and dated about the year 4383 of the Cali yug, or 516 years ago; and the mean annual motions of the planets given in that work, were on the principles of the Hindu astronomy, calculated to give the positions of the planets in the heavens at that time, as near at least, as the author could determine by observation. However, in order to do away these delusions, I shall, before I proceed to the investigation of the antiquity of the Surya Siddhânta, explain, in as simple a manner as possible, the principles upon which the Hindu systems are founded, and the manner in which they are formed.

4. In the first place it is necessary to observe, that in most of the Hindu systems, certain points of time

* 1. Tables from Trivalore, dated in 1413 Saka. 2. Tables from Chrsinaboram. 3. Tables from Narsi^oor, dated 1491 Saka. 4. Tables from Siam.

back.
back, are fixed on as epochs, at which the planets are assumed to fall into a line of mean conjunction with the Sun, in the beginning of Aries. From the points of time, so assumed as epochs, the Hindu astronomer carries on his calculations, as if they had been settled so by actual observation; and determines the mean annual motions, which he must employ in his system, from thence, as will give the positions of the planets in his own time; as near as he is able to determine the same by observation.

5. In fixing on these epochs, the first Hindu astronomers took the precaution to throw them so far back into antiquity, that the difference between the assumed, and real places of the planets, whatever they might be at that time, would, when divided by the number of years expired from thence, in a manner vanish; or at least become too inconsiderable, to affect the mean annual motions of the planets, deduced from thence for several years. For, it is easy to perceive, that a point of time, may be fixed on so far back, that the mean annual motions of the planets to be from thence deduced, (upon a supposition of their being then in a line of mean conjunction in the beginning of Aries) shall give the real positions of the planets at present, agreeing with observations: and yet, the mean annual motions, so deduced, shall not differ from the real mean annual motions, above any assignable quantity, however small.

6. For, let an epoch of mean conjunction, be assumed at only the distance of 648000 years ago; without troubling ourselves at all with the real positions of the planets at that time, (which it would be impossible to know) now since the greatest possible difference that can ever happen, at any proposed time between the assumed, and real place of a planet, cannot
cannot exceed six signs; if we divide this quantity, by the number of years supposed now expired, we shall have $68 \frac{68}{648000} = 0^0 0' 0'' 0'',1$, or one tenth of a second, for the greatest possible difference that could arise between the real mean annual motions of the planets as determined by European astronomers, and those which it would be necessary to employ, reckoning from the epoch thus assumed, as would give the positions of the planets at present, with the same degree of accuracy, as the most modern of European tables.

7. It must therefore appear obvious, that the further back an epoch of mean conjunction is assumed, the nearer should the annual motions to be thence adduced, agree with the real mean annual motions, determined from actual observations: And on the contrary, the nearer such epoch is assumed to our own time, the greater the difference will be; unless a point of time is found by computation, at which the planets were either in a line of mean conjunction, or so near, that the difference, when divided among the years expired, would not sensibly affect the mean annual motions to be thence derived: but in this case, it is necessary that the Sun and Moon, should be in a line of mean conjunction at the assumed epoch: or at least very nearly so, in proportion to the distance of time back; for otherwise, the computed times of conjunctions, oppositions, and eclipses, of these luminaries, would not agree with observation, for any considerable number of years.

8. Upon this principle, the epoch now commonly called the commencement of the Cali yug, appears to have been fixed on, by Varaha and some other Hindu astronomers since his time: for, though the planets were not then actually in a line of mean conjunction,
conjunction, yet, the differences between their respective positions, and that which was assumed, when divided among the years expired from that epoch, to the time of Varaha, were considered as too small, to cause any considerable difference between the real mean annual motions, and those which it would be necessary to assume, so as to give the positions of the planets at that time, or even to cause any sensible error in their computed places deduced from thence for many years.

9. But, in order to make this still plainer, let us suppose, that a Hindu astronomer now starts up, possessed of instruments and other means, whereby he is able to determine the real positions of the planets at present; and that he is desirous of forming a complete new system, upon the principles of his predecessors; that is to say, assuming a mean conjunction of the planets, at the commencement of the Cali yug, what must be the mean annual motions, necessary to be given in such system, so as to bring out the longitudes of the planets agreeing with observations; or their positions in the heavens, as deduced from European tables.

10. Let the planets be supposed to have been in a line of mean conjunction, in the beginning of Aries, at the commencement of the Cali yug: that is to say, at the instant of midnight, between Thursday the 17th, and Friday the 18th February O. S. in the year of the Julian period 1612, on the meridian of Lanka*: or about 75° 50' east of Greenwich: and let the time at which the mean longitudes of the planets, are to be determined as from observation,

* The Hindus suppose that Lanka lies in the same meridian with Ugoen in the Mharatta dominions, the longitude of which has been determined from a great number of observations made by Dr. Hunter to be 75° 50' cast of Greenwich.
be the end of the year 4900 of the Cali yug, at the instant the Sun is supposed to be entering Aries, in the Hindu sphere according to mean motions.

11. Now from the commencement of the Cali yug, to the end of the year 4900, by the Suryâ Siddhánta, is 1789767 days 54° 24' 20"; corresponding to the 12th April 1799, at 45' 44" past nine P. M. on the meridian of Lanka, or 51' 40" past four P. M. on the meridian of Paris. The mean longitude of the Sun, Moon, and planets, at that instant, according to M. De la Lande's tables of 1792, will be as follows:

**European Sphere.**

<table>
<thead>
<tr>
<th>Planet</th>
<th>Mean Longitude</th>
<th>Sun</th>
<th>Moon</th>
<th>Mercury</th>
<th>Venus</th>
<th>Mars</th>
<th>Jupiter</th>
<th>Saturn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>20° 52' 28.5&quot;</td>
<td>3 22 55 9.3</td>
<td>3 22 42 42</td>
<td>2 24 6 14</td>
<td>3 4 50 40</td>
<td>1 29 58 2.1</td>
<td>3 24 16 56.1</td>
</tr>
</tbody>
</table>

12. The mean longitude of the Sun at that instant in the Hindu sphere is = 0s. 0° 0' 0'', because he is supposed just entering Aries, according to mean motions: but his mean longitude is the European sphere, being then = 0s. 20° 52' 28.5'', the difference between the spheres at that moment, becomes equal to that quantity; which must therefore be deducted from the mean longitudes above determined, and we have the relative positions of the Sun, Moon, and planets, in the Hindu sphere as follows:
Hindu Sphere.

Sun's mean longitude, 0s. 0° 0' 0"
Moon's ditto, 3 2 2 40,8
Mercury's ditto, 3 1 50 13,5
Venus's ditto, 2 3 13 45,5
Mars's ditto, 2 13 58 11,5
Jupiter's ditto, 1 9 5 33,6
Saturn's ditto, 3 3 24 27,6

13. The mean longitude of the Sun, Moon, and planets, in the Hindu sphere, at the end of the year 4900 of the Cali yug, being thus determined, we must now find the quantities of the mean annual motions, that will just give these positions, reckoning from the commencement of the Cali yug, as an epoch of assumed mean conjunction.

14. The length of the Hindu year, according to the Surya Siddhanta, is 365 days 15° 31' 31" 24'', in which time the Sun is supposed to make one complete revolution in his orbit. The mean motions of the Sun, Moon, and planets, in that space of time by De la Lande's tables, are as follows:

European Sphere.

<table>
<thead>
<tr>
<th></th>
<th>1r.</th>
<th>Os.</th>
<th>0°</th>
<th>0'</th>
<th>58&quot;</th>
<th>40&quot;,</th>
<th>26</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td></td>
<td></td>
<td>1r.</td>
<td>Os.</td>
<td>0°</td>
<td>0'</td>
<td>58&quot;</td>
</tr>
<tr>
<td>Moon</td>
<td>13</td>
<td>4</td>
<td>12</td>
<td>47</td>
<td>39</td>
<td>17,03</td>
<td></td>
</tr>
<tr>
<td>Mercury</td>
<td>4</td>
<td>1</td>
<td>24</td>
<td>46</td>
<td>35</td>
<td>36,9</td>
<td></td>
</tr>
<tr>
<td>Venus</td>
<td>1</td>
<td>7</td>
<td>15</td>
<td>12</td>
<td>22</td>
<td>18,4</td>
<td></td>
</tr>
<tr>
<td>Mars</td>
<td>0</td>
<td>6</td>
<td>11</td>
<td>17</td>
<td>49,3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jupiter</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>21</td>
<td>49</td>
<td>9,2</td>
<td></td>
</tr>
<tr>
<td>Saturn</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>14</td>
<td>8</td>
<td>0,9</td>
<td></td>
</tr>
</tbody>
</table>

15. These motions being reduced to the Hindu sphere, by deducting the difference between the spheres at the end of one complete Hindu year = 58" 40", 26; we shall have their respective mean annual motions in the Hindu sphere, as follows:

Hindu
### Hindu Sphere.

<table>
<thead>
<tr>
<th></th>
<th>1st.</th>
<th>0s.</th>
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<th>0'</th>
<th>0&quot;</th>
<th>0&quot;&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>-</td>
<td>-</td>
<td>13</td>
<td>4</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>Moon</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>1</td>
<td>24</td>
<td>45</td>
</tr>
<tr>
<td>Mercury</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>7</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Venus</td>
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<td>0</td>
<td>6</td>
<td>11</td>
<td>24</td>
</tr>
<tr>
<td>Mars</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Jupiter</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Saturn</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

16. **Multiplying** these by 4900, the number of years expired from the assumed epoch, we obtain the Number of revolutions, &c. of each planet in that space of Time; from which rejecting the fractional parts of a revolution, and substituting in their stead, the sign, degree, &c. the planet is in, (at the end of the year 4900 above determined from *European* tables) and then dividing the whole by 4900, we get the mean annual motions required, as follows:

### Hindu Sphere.

<table>
<thead>
<tr>
<th></th>
<th>1st.</th>
<th>0s.</th>
<th>0°</th>
<th>0'</th>
<th>0&quot;</th>
<th>0&quot;&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>-</td>
<td>-</td>
<td>13</td>
<td>4</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>Moon</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>1</td>
<td>24</td>
<td>45</td>
</tr>
<tr>
<td>Mercury</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>7</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Venus</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>6</td>
<td>11</td>
<td>24</td>
</tr>
<tr>
<td>Mars</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Jupiter</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Saturn</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

From this example, a general idea may be formed of the principles of the *Hindu* astronomy, and the manner of determining the mean annual motions of the planets at different periods, from their positions in the heavens being then given by observation.

17. If we compare the mean annual motions thus determined, with those deduced from *De la Lande’s* tables, we shall find, that they differ considerably: and that the latter make the

Moon’s
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Moon's mean annual motion, - 0" 4",4 less.
Mercury's ditto, - - - - 24 34,4 greater.
Venus's ditto, - - - - 24 2,5 less.
Mars's ditto, - - - - 8 53,2 great.
Jupiter's ditto, - - - - 12 31,4 less.
Saturn's ditto, - - - - 15 24,7 great.

18. From these circumstances, an European astronomer, unacquainted with the principles of the Hindu systems, on seeing such motions given in Hindu tables, would be apt to be deceived by appearances, and assign a degree of antiquity to the work it never possessed; thinking, that the author must have lived at that period, when according to his ideas, the quantities of the mean annual motions were the same as given in the book. This shews the absolute necessity of being acquainted with the principles of the Hindu systems of astronomy, before we can attempt to investigate their antiquity from the quantity of the mean annual motion of a planet. For the mean annual motion of Jupiter above deduced, is 1s. 0° 21' 5", which quantity, according to the principles of the European astronomy, would refer the age of a book in which it was found, to a period some thousands of years back; though, in reality it is only calculated to give the position of that planet at the end of the year 4900 of the Cali yug, agreeing with European tables; and so of the motions of the rest of the planets above deduced. For, let the mean annual motions above deduced, be multiplied by 4900, and we shall have

Sun, revolutions 4900 — Os. 0° 0' 0"
Moon, ——— 65507 — 3 2 2 40,8
Mercury, ——— 20345 — 3 1 50 13,5
Venus, ——— 7963 — 2 3 13 45,5
Mars, ——— 2605 — 2 13 58 11,5
Jupiter, ——— 413 — 1 9 5 33,6
Saturn, ——— 165 — 3 3 24 27,6

w Ich
which are precisely the same as those computed from
De la Lande's tables for the same instant (§ 12).

19. However, though the motions above assigned, give the mean Heliocentric longitudes of the planets perfectly correct at the end of the year 4900 of the Cali yug; yet, on account of the small differences between them, and the real mean annual motions, as well as on account of the inequalities observed by modern astronomers in the motions of some of the planets, they would every year after vary more and more from the truth, in proportion to the differences. This, in fact, is the case with all the Hindu systems of astronomy: and when the error becomes sensible, they either form a new system, or else introduce a correction to the old, which they term beej.

20. The Hindu systems of astronomy now in use, may be divided into three distinct classes. First, such as assume a conjunction of the sun, moon, and planets, with the nodes and apsides of their orbits, in the first point of Aries at beginning and end of the Calpa of Brohma*. Secondly, such as assume a conjunction at the beginning and end of the Calpa of Varaha, with a mean conjunction at the end of certain cycles or periods of years. Thirdly, such as assume

* The Calpa of Brohma contains 4320000000 Hindu years, and commenced 197294000 years before the beginning of the present Cali Yug: it may have derived its name from Brohma Gupta, who may probably have been the author of it. The Calpa of Varaha consists of the same number of years, but commenced 17064000 years later, and derives its name from Varaha Mihiir, author of the Surya Siddhanta, at Karnob, &c. The Calpa is divided into lesser periods of years, called Manwantaras and Yugs: the intention of which seems to be, to assist the memory in calculating the years expired of the system: at least they answer no other purpose at present. In a valuable fragment in my possession, the durations of the Calpas, Manwantaras, and Yugs, of the ancient Hindus, are stated totally different from those now in use.
no conjunction at the beginning or end of either Calpa, or at any other period.—To the first class, belong the works of Brohma Gupta, the Siddhanta, Sromoni of Bhasker, &c. which make no conjunction of the planets at the commencement of the present Cali yug. To the second, belong the Surya Siddhanta, Soma Siddhanta, Vasishtha-Siddhanta, &c. and such as assume a mean conjunction at the beginning of the Cali yug only, as the Jat Karnob of Varaha, the tables of Trivalore, &c. To the third, belong the Brohma Siddhanta, Vishnu Siddhanta, Bhasvoti Drubo Rothono, Chondrika, &c. These last are nearly on the principles of the European astronomy, the mean annual motions not being affected by any assumed epoch, and consequently make no conjunction of the planets either at the beginning of the present Cali yug, or at any other period.

21. THE revolutions of the planets, &c. in a Calpa, or 48200000000 years, according to Brohma Gupta and Bhasker Acharya, are as follows:

<table>
<thead>
<tr>
<th>Sun, Moon, and Planets</th>
<th>Apsides.</th>
<th>Nodes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>43200000000</td>
<td>480</td>
</tr>
<tr>
<td>Moon</td>
<td>57753300000</td>
<td>488105858</td>
</tr>
<tr>
<td>Mercury</td>
<td>17936998984</td>
<td>653</td>
</tr>
<tr>
<td>Venus</td>
<td>7022389492</td>
<td>592</td>
</tr>
<tr>
<td>Mars</td>
<td>2296828522</td>
<td>853</td>
</tr>
<tr>
<td>Jupiter</td>
<td>364226455</td>
<td>41</td>
</tr>
<tr>
<td>Saturn</td>
<td>146567298</td>
<td></td>
</tr>
</tbody>
</table>

22. In the Surya Siddhanta, the least cycle of years in which the sun, moon, and planets, are supposed to return to a line of mean conjunction in the beginning of Aries, is 10800000 years: or the fourth part
part of a *Maha yug*, and the revolutions of each planet, given in that cycle, are as follows:

<table>
<thead>
<tr>
<th>Planet</th>
<th>Revolutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>1080000</td>
</tr>
<tr>
<td>Moon</td>
<td>14438334</td>
</tr>
<tr>
<td>Mercury</td>
<td>4484265</td>
</tr>
<tr>
<td>Venus</td>
<td>1755594</td>
</tr>
<tr>
<td>Mars</td>
<td>574208</td>
</tr>
<tr>
<td>Jupiter</td>
<td>91055</td>
</tr>
<tr>
<td>Saturn</td>
<td>36642</td>
</tr>
</tbody>
</table>

23. **These** revolutions were found by multiplying the mean annual motions by 1080000, the number of years assumed to the cycle: rejecting from the product all fractional parts of a revolution under six signs, and adding one revolution for those equal to or above that quantity. Thus let the mean annual motions which we have determined (§ 16) on the assumption of the planets having been in a line of mean conjunction at the beginning of the *Cali yug*, be multiplied by 1080000, and we shall have,

<table>
<thead>
<tr>
<th>Planet</th>
<th>Revolutions</th>
<th>Signage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>1080000</td>
<td>0 s. 0° 0'</td>
</tr>
<tr>
<td>Moon</td>
<td>14438333</td>
<td>10 25 0</td>
</tr>
<tr>
<td>Mercury</td>
<td>4484260</td>
<td>3 20 0</td>
</tr>
<tr>
<td>Venus</td>
<td>1755589</td>
<td>8 25 0</td>
</tr>
<tr>
<td>Mars</td>
<td>574208</td>
<td>6 20 0</td>
</tr>
<tr>
<td>Jupiter</td>
<td>91052</td>
<td>6 0 0</td>
</tr>
<tr>
<td>Saturn</td>
<td>36644</td>
<td>11 10 0</td>
</tr>
</tbody>
</table>

From which rejecting all fractional parts of a revolution under six signs, and encreasing the rest to unity, we have,

<table>
<thead>
<tr>
<th>Planet</th>
<th>Revolutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>1080000</td>
</tr>
<tr>
<td>Moon</td>
<td>14438334</td>
</tr>
<tr>
<td>Mercury</td>
<td>4484260</td>
</tr>
</tbody>
</table>

*The revolutions given in the *Surya Siddhanta* are for a *Maha yug*, but they must be always divisible by four, otherwise a mean conjunction could not take place at the beginning of the *Cali yug*. They are here reduced accordingly.*

Venus
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Venus, revolutions 1755590
Mars, 574209
Jupiter, 91053
Saturn, 36645

24. Comparing these, with the numbers in the same period, by the Surya Siddhanta (§ 22), it will appear, that the number of revolutions of Mercury, according to that work, is 5 greater,
Of Venus, 4 greater,
Of Mars, 1 less,
Of Jupiter, 2 greater,
Of Saturn, 3 less.

These differences, the Hindu astronomers call beej; or the corrections to be applied to the mean places of the planets, computed from the Surya Siddhanta*.

25. Having thus given the revolutions of the sun, moon, and planets, in the cycle of 1080000 years in imitation of the Surya Siddhanta, I shall now shew their use in determining the mean longitudes of each at any time proposed.

EXAMPLE.

Let the time be the end of the year 4900 of the Cali yug, or the 12 April, 1799, at 51° 40' past four P. M. on the meridian of Paris; to find the mean longitudes of the sun, moon, and planets, in the Hindu sphere, at that instant. Say, as 1080000 is to the number of revolutions in that cycle, so is the number of years expired of the Cali yug, to the planets mean longitude at the end of that time: Thus,

* In the Siddhanta Rakosyo, dated in 1513 Saka, the beej or corrections are as follow: Mercury 4; Venus 3; Jupiter 2; revolutions in 1080000 years subtractive; and Saturn 3 additive; the Groho Toronzini dated in 1530; Siddhanta Munjeri dated in 1531 Saka; Bisukito and tables of Chrisnaboram (all of which have been deduced from the Surya Siddhanta) adopt the beej to correct the mean longitudes of the planets, as computed from the motions deduced from the Surya Siddhanta.
<table>
<thead>
<tr>
<th>Apsides.</th>
<th>Nodes retrograde.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>387</td>
</tr>
<tr>
<td>Moon</td>
<td>488203000</td>
</tr>
<tr>
<td>Mercury</td>
<td>368</td>
</tr>
<tr>
<td>Venus</td>
<td>535</td>
</tr>
<tr>
<td>Mars</td>
<td>204</td>
</tr>
<tr>
<td>Jupiter</td>
<td>900</td>
</tr>
<tr>
<td>Saturn</td>
<td>39</td>
</tr>
</tbody>
</table>

26. The revolutions of the apsides and nodes in a Calpa, or 43200000000 years, according to the Surya Siddhanta, are as follow:

27. From what has been already said respecting the manner of determining the mean annual motions of the planets (§ 14, 15, & 16, and the number of revolutions of each, from thence (§ 23) in 1080000 years; no difficulty can occur in forming an idea of the mode by which those of the apsides and nodes were obtained.

28. The commencement of the Calpa of Varaha, is fixed at the distance of 1955880000 years before the beginning of the present Cali yug, at the instant of midnight between Saturday and Sunday on the meridian of Lanka; at which instant, the sun moon...
and planets, with the apsides and nodes of their orbits, are assumed to have been in a line of conjunction in the beginning of Aries.

29. The longitudes of the aphelia and nodes, at the end of the year 4900 of the Cali yug; or 12th April 1799, at 51' 40" past four P. M. on the meridian of Paris, by De la Lande's tables will be as follow:

<table>
<thead>
<tr>
<th></th>
<th>European Sphere.</th>
<th>Nodes--supplement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun's apogee</td>
<td>3 9 23 18,3</td>
<td>10 12 49 2,8</td>
</tr>
<tr>
<td>Moon's ditto</td>
<td>0 16 10 30,3</td>
<td>1 15 56 16</td>
</tr>
<tr>
<td>Mercury's aphel.</td>
<td>8 14 20 11</td>
<td>2 14 51 46</td>
</tr>
<tr>
<td>Venus's ditto</td>
<td>10 8 35 37</td>
<td>1 18 1 38</td>
</tr>
<tr>
<td>Mars's ditto</td>
<td>5 2 23 26</td>
<td>3 8 23 41</td>
</tr>
<tr>
<td>Jupiter's ditto</td>
<td>6 11 7 40</td>
<td>3 21 56 17</td>
</tr>
<tr>
<td>Saturn's ditto</td>
<td>8 29 3 23</td>
<td></td>
</tr>
</tbody>
</table>

30. Their longitudes in the Hindu sphere, are had by deducting $0^° 20^° 52^' 28,5^"$ (§ 12) from those of the aphelia, and adding it to those of the nodes, as follows:

<table>
<thead>
<tr>
<th></th>
<th>Hindu Sphere.</th>
<th>Nodes--supplement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun’s apogee</td>
<td>2 18 35 49,8</td>
<td>11 3 41 31,3</td>
</tr>
<tr>
<td>Moon’s ditto</td>
<td>11 25 18 1,8</td>
<td>2 6 48 44,5</td>
</tr>
<tr>
<td>Mercury’s aphel.</td>
<td>7 23 27 42,5</td>
<td>3 5 44 14,5</td>
</tr>
<tr>
<td>Venus’s ditto</td>
<td>9 17 43 8,5</td>
<td>2 8 54 6,5</td>
</tr>
<tr>
<td>Mars’s ditto</td>
<td>4 11 30 57,5</td>
<td>3 29 16 9,5</td>
</tr>
<tr>
<td>Jupiter’s ditto</td>
<td>5 20 15 11,5</td>
<td>4 12 43 45,5</td>
</tr>
<tr>
<td>Saturn’s ditto</td>
<td>8 8 10 55,5</td>
<td></td>
</tr>
</tbody>
</table>

31. The longitudes of the aphelia and nodes being given by assumption, at the commencement of the Calpa (§ 28); and their positions at the end of the year 4900 of the Cali yug, by European tables (§ 29 and 30); (which may be supposed to agree with observation) we obtain from thence, the following annual
Annual motions of the aphelia and nodes, agreeing with European tables.

Annual motions of the apsides—Hindu sphere.

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>28</td>
<td>34</td>
<td>24</td>
<td>55</td>
<td>38</td>
</tr>
<tr>
<td>Moon</td>
<td>1</td>
<td>1035</td>
<td>35</td>
<td>35</td>
<td>26</td>
<td>36</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>Mercury</td>
<td>-</td>
<td>2.25</td>
<td>9</td>
<td>59</td>
<td>38</td>
<td>0</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>Venus</td>
<td>-</td>
<td>10</td>
<td>4</td>
<td>11</td>
<td>39</td>
<td>9</td>
<td>26</td>
<td>8</td>
</tr>
<tr>
<td>Mars</td>
<td>-</td>
<td>8</td>
<td>19</td>
<td>50</td>
<td>19</td>
<td>37</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Jupiter</td>
<td>-</td>
<td>1</td>
<td>56</td>
<td>23</td>
<td>23</td>
<td>4</td>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>Saturn</td>
<td>-</td>
<td>7</td>
<td>24</td>
<td>1</td>
<td>58</td>
<td>31</td>
<td>33</td>
<td>33</td>
</tr>
</tbody>
</table>

Annual motion of the nodes.

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moon's</td>
<td>0</td>
<td>19</td>
<td>21</td>
<td>31</td>
<td>5</td>
<td>15</td>
<td>30</td>
<td>51</td>
</tr>
<tr>
<td>Mercury's</td>
<td>1</td>
<td>41</td>
<td>58</td>
<td>19</td>
<td>20</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Venus's</td>
<td>1</td>
<td>29</td>
<td>40</td>
<td>19</td>
<td>2</td>
<td>29</td>
<td>29</td>
<td>57</td>
</tr>
<tr>
<td>Mars's</td>
<td>1</td>
<td>26</td>
<td>40</td>
<td>17</td>
<td>41</td>
<td>53</td>
<td>0</td>
<td>52</td>
</tr>
<tr>
<td>Jupiter</td>
<td>1</td>
<td>34</td>
<td>22</td>
<td>18</td>
<td>57</td>
<td>22</td>
<td>36</td>
<td>31</td>
</tr>
<tr>
<td>Saturn</td>
<td>1</td>
<td>30</td>
<td>13</td>
<td>19</td>
<td>10</td>
<td>58</td>
<td>13</td>
<td>44</td>
</tr>
</tbody>
</table>

32. The motions of the aphelia of Mercury, Venus and Jupiter, are retrograde in the Hindu sphere; though direct in that of the Europeans: the reason of this, is owing to the difference between the motions of the two spheres, with respect to each other: for, if we conceive the first point of Aries in the Hindu sphere to coincide with the vernal equinox then at the expiration of $365^{d.} 6^{h.} 12^{m.} 36^{s.} 33'' 36''$ (the length of the Hindu year according to the Surya Siddhanta), the Sun would again enter Aries in the Hindu sphere: but his distance at that very moment from the vernal equinox would be $= 58'' 40'' 15^{m.} 36''$, the true quantity by which the European and Hindu spheres, recede from each other annually;
nually; and not 54", as found in some Hindu books. Hence it follows, that if the motion of the aphelion of a planet, was exactly 58" 40' 15" 36', in the European sphere, it would have none in that of the Hindus; but would be considered as fixed. And, if the motion was less, then it would be retrograde; as is the case with the aphelia of Mercury, Venus, and Jupiter.

33. FROM the motions above determined (§ 31), we obtain the following revolutions of the aphelia and nodes in a Calpa, requisite to give their positions by direct computation.

<table>
<thead>
<tr>
<th>Apsides</th>
<th>Notes—retrograde.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>10366 direct.</td>
</tr>
<tr>
<td>Moon</td>
<td>488122956 ditto.</td>
</tr>
<tr>
<td>Mercury</td>
<td>7961 retro.</td>
</tr>
<tr>
<td>Venus</td>
<td>33023 ditto.</td>
</tr>
<tr>
<td>Mars</td>
<td>29030 direct.</td>
</tr>
<tr>
<td>Jupiter</td>
<td>6698 retro.</td>
</tr>
<tr>
<td>Saturn</td>
<td>23023 direct.</td>
</tr>
</tbody>
</table>

These numbers differ widely from those given in the Suryá Siddhánta (§ 26), owing to the slow motions assigned to the aphelia and nodes, in that work.

34. THE revolutions of the aphelia and nodes in a Calpa, being thus ascertained, the following examples will shew their applications and use.

EXAMPLE. Let it be required to determine by computation, the longitudes of the Sun's apogee, Moon's apogee, and the aphelion of Jupiter, in the Hindu sphere, at the end of the 4900 of the Cali yug. From the commencement of the Calpa of Varaha, to the beginning of the Cali yug, (§ 28) = 1955880000 years

Add - - - - - 4900
Total years expired of the Calpa, 1955884900

Then
Then say, as \( 4320000000 \) years to the number of revolutions in that cycle, so is the time expired to the longitude.

Thus, longitude of the

Sun's apogee, \[ = \frac{10566 \times 1955884900}{4320000000} = 4693^{\text{Rev.}}. -2'80'34'22'' \&c. \]

Moon's apogee, \[ = \frac{488112956 \times 1955884900}{4320000000} = 220998221 -11 25 18 49 \&c. \]

Jupiter's aphel. \[ = \frac{6698519 \times 5384900}{4320000000} = 3032 -6 9 45 18 \&c. \]

but the motion of Jupiter's aphelion being retrograde we must deduct this longitude from twelve signs; and we shall have, 5s. 20' 14' 41'' \&c. the longitude required.

Again, let the longitude of the Moon's ascending node, at the end of the year 4900 of the Cali yug be required.

Longitude of the Moon's ascending node in antecedentia.

\[ = \frac{232308774 \times 1955884900}{4320000000} = (105178060) 11s 3^d 40' 33'' \&c. \]

which deducted from twelve signs, leaves 0s. 268 19' 26'' \&c. for the longitude of the node, according to the order of the signs.

LENGTH OF THE HINDU YEAR.

35. Hitherto I have supposed the length of the Hindu year to be 365$^{d}$. 15$^{\text{h}}$. 31$'$ 31$''$ 24$'''$, the same as in the Sarya Siddhanta; and all the preceding calculations respecting the motions of the planets, \&c. are made on that supposition. It is, however, to be observed, that when a Hindu astronomer forms a new system conformably to the positions of the planets, \&c. in his time, he must likewise deter-
mine the length of the year, to be given in that system.

36. In order to ascertain the length of the *Hindu* year, two things are necessary to be first known. 1st. The instant of the commencement of the year. 2d. The time expired from the beginning of the cycle, to that instant. The first, is supposed to be found by observation by determining that instant of time, when the difference of longitude between the Sun and a known fixed Star, is equal to the longitude assigned to the Star in the *Hindu* sphere. The longitudes of the twenty-seven *Yoga* Stars, may be found in many *Hindu* books of astronomy; but all that have hitherto come into my hands, appear silent as to the manner in which the observation is conducted, or the particular Star by which it is made: *Chitra* or the virgin spike, (perhaps from its situation) is generally supposed to be the Star observed on such occasions; and its longitude, according to *Brohma Gupta* and some others, is 6° 3° O in the *Hindu* sphere.

37. According to *Varaha*, the year 3601 of the *Cali* yog, began precisely at the instant of the vernal equinox; that is, the Sun had then entered *Aries* according to the true motions: consequently, the *Hindu* and *European* spheres had then (A.D. 499) coincided.

The longitude of *Spica*, in A.D. 1750, was

Deduct precession for 1251 years,

at 50° 1 per a.  = 17 24 35

Longitude of *Spica*, in A.D. 499, = 6 2 56 43

*Brohma Gupta* makes it - = 6 3 0 0

Difference, about - - 3 17

However, from the most accurate comparisons I have been able to make, respecting the length of the year, as given in different books, whose ages are known, either
either from dates or computations; it would appear, that the longitude assigned to Chitra, by Brohma Gupta, &c. is too great by upwards of fifty minutes.

38. The Sun's true longitude, when he enters Aries, according to mean motions, is stated by Hindu tables at about 0s. 2° 7' 24"; now if we suppose the longitude of Chitra, to be 6 s. 2° 7' 24", (to avoid trouble in calculation) the difference of longitude between the Sun and Star, when the former enters Aries according to mean motions, will be exactly six signs.

39. The distance, or difference of longitude between the Sun and Star, (at the commencement of the year according to mean motions), being thus supposed six signs; we can easily ascertain the instant they are in that position, and from thence the length of the year, as follows: Sun's mean longitude in the European sphere on the 12th April, 1799, at 45° 44" past 9 P.M. on the meridian of Lanka (§ 11). = 0s. 20° 52' 28", 5

Equation of his center, + 0 1 52 45
Sun's true longitude, 0 22 45 13,5
Longitude of Spica same time, =6 21 2 32,5
Difference of longitudes between 0 & * 5 28 17 19
Which deduct from 6 0 0 0
Remain 0 1 42 41
Which reduced to time make, 1 day 44 dob 46' 44"

Now the time expired from the commencement of the Cultiyug, to the above instant, is (§ 11), 1789767 days 54 de 24' 20"

Deduct 1 44 46 44
Remain 1789766 9 37 36

or the instant at which the Sun and Star would be exactly six signs distant from each other, being the commencement of the year, according to mean motions; and which being divided by 4900, the

2 n 4

num-
number of years then expired of the Cali yug, we shall have $\frac{178766}{900} = 365 \text{ days } 15^{\text{do.}} \ 30' \ 14'' \ 25'''$, the length of the Hindu year in A.D. 1799, upon the supposition that Chitra is exactly six signs distant from the Sun the moment he enters Aries according mean motions.

40. The Sun is found to revolve from any fixed Star to the same again in $365 \text{ days } 6^\text{h} \ 9' \ 11'' \ 36'''$, which is the length of the sidereal year, as determined, by European astronomers. Hence, after the expiration of one compleat sidereal year, from the time above determined, the Sun would again return to the same position with respect to Spica: it may therefore be asked, why is the Hindu year longer than the sidereal year of the European astronomers? To understand the reason of this, it must be observed that at the time above determined, at which the Sun and Star would be exactly six signs distant from each other the number of days expired of the Cali yug, would be precisely $1789766 \ 9 \ 37 \ 36$. But $4900$ sidereal years, make only $1789756 \ 16 \ 58 \ 0$. Difference, $9 \ 52 \ 39 \ 16$. Hence it follows, that as the number of days expired of the Cali yug at the time, exceeds the number in $4900$ sidereal years, by nearly ten days; that difference, when divided amongst the years expired, must evidently cause an excess in the length of the Hindu year, above the sidereal.

41. Hence also, the length of the Hindu year, may be commodiously obtained, at any proposed period, by the following formula:

Let $d = 9 \text{ days } 52 \text{ do. } 39' \ 16''$
$s = 365 \ 15 \ 22 \ 59 = \text{ the sidereal year,}$
$h = \text{ length of the Hindu year,}$
$n = \text{ number of years expired of the Cali yug,}$

Then
THE SURYA' SIDDHA'NTA, &C.

Then \( s + \frac{d}{n} = h \)

And \( \frac{d}{h-s} = n \).

42. From the formula \( s + \frac{d}{n} = h \), the following table has been computed, shewing the length of the Hindu year, at different periods by inspection.

<table>
<thead>
<tr>
<th>Year (1st Bysack)</th>
<th>A.D.</th>
<th>Length of the Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>3601</td>
<td>499</td>
<td>365 dys 15 do 32' 51&quot; 39'</td>
</tr>
<tr>
<td>3701</td>
<td>599</td>
<td>15 32 35 38</td>
</tr>
<tr>
<td>3801</td>
<td>699</td>
<td>15 32 20 28</td>
</tr>
<tr>
<td>3901</td>
<td>799</td>
<td>15 32 6 4</td>
</tr>
<tr>
<td>4001</td>
<td>899</td>
<td>15 31 52 24</td>
</tr>
<tr>
<td>4101</td>
<td>999</td>
<td>15 31 39 23</td>
</tr>
<tr>
<td>4201</td>
<td>1099</td>
<td>15 31 26 59</td>
</tr>
<tr>
<td>4301</td>
<td>1199</td>
<td>15 31 15 11</td>
</tr>
<tr>
<td>4401</td>
<td>1299</td>
<td>15 31 3 54</td>
</tr>
<tr>
<td>4501</td>
<td>1399</td>
<td>15 30 53 7</td>
</tr>
<tr>
<td>4601</td>
<td>1499</td>
<td>15 30 42 49</td>
</tr>
<tr>
<td>4701</td>
<td>1599</td>
<td>15 30 32 57</td>
</tr>
<tr>
<td>4801</td>
<td>1699</td>
<td>15 30 23 29</td>
</tr>
<tr>
<td>4901</td>
<td>1799</td>
<td>15 30 14 25</td>
</tr>
</tbody>
</table>

This much may serve to explain the principles on which the length of the Hindu year depends. There is however another method for determining the length of the year, from the precession of the equinoxes, which I shall now explain.

43. I have already observed (§ 37), that according to Varaha, the year 3601 of the Cali yug, began at the instant of the vernal equinox (in A.D. 499), The same astronomer fixed also the rate of precession at 54" annually. Hence by knowing the time of coincidence of the Hindu and European spheres, and the rate of precession, we can easily determine from thence, the instant at which the Hindu year
year ought to commence. For, then the distance of the first point of Aries in the Hindu sphere, from the vernal equinoctial point, must be always equal to the whole precession. For example, at the end of the year 4900 of the Cali yug, the precession at 54\" annually, will amount to 19\' 30\'; which on the principles above stated should the Sun's true longitude in the European sphere, at the instant of the commencement of the Hindu year according to true motions.

The Sun's true longitude on the 12th April 1799, at 51\' 40\" past 4 P. M. on the meridian of Paris in the European sphere (§ 39) = 0\s. 22\° 45\' 13,5\'

Deduct the precession = 0 19 30 0

Remain = 3 15 13,5

Which reduced to time according to true motions make = 3\text{rd} 19\text{th} 21\' 02\'

From the time then expired of the Cali yug (§ 11) = 1789767 54 24 20

Deduct = 3 19 21 02

Remain commencement of the Hindu year = 1789764 35 3 18

Add Hindu equation of the Sun's center reduced to time = 2 10 12 40

Sun enters Aries according to mean motions at = 1789766 45 15 58

which being divided by 4900, the number of years expired of the cycle, we shall have \(\frac{365\text{\text{rd}} 15\text{th} 30\text{th} 40\text{th} 36\text{\text{th}}}{}\)

\(\frac{\text{days}}{}=\frac{4900}{1789766}\)

The length of the Hindu year in A. D. 1799, from the precession of the equinoxes as settled by Varaha. In this operation the length of the Hindu year, comes out somewhat greater than that deduced from the position of Chitra. Both methods, however, agree in giving the same length to the year, between 7 and 800 years ago; about which time, according to the testimony of some Hindu books, as well as from computation, Varaha must have lived and made his observations.

44. The
44. The length of the year being determined either from the position of Chitra, or the precession of the equinoxes as above explained (§ 39, 48), the next thing a Hindu astronomer has to do (if he means to form a compleat system in imitation of the Surya Siddhanta), is to ascertain the number of days to be assigned to the cycle of 1080000 years. This is done by multiplying the length of the year by that number. For example let the length of the year A.D. 1799 deduced from the position of Chitra = 365½°.15 do. 30' 14'' 25'', be multiplied by 1080000, and we shall have 394479072, for the nearest number of days in that cycle.

45. In the Surya Siddhanta the Calpa is made to commence with Sunday as the first day of the week, and the present Cali yug, is made to begin with Friday. Therefore, in reckoning from the commencement of the Calpa, the number of days to be assigned to the above cycle, must be so regulated that the first day of the cycle which we now are in, may fall on Friday. The number of cycles expired at the commencement of the Cali yug, was 1811; which divided by 7, leaves a remainder of 5: hence, every cycle must contain a compleat number of weeks and one day over, to make the present begin with Friday.

46. The number of revolutions of the Moon in the cycle of 1080000 years, and the number of mean solar days in the same period should be so adjusted with each other, as to give the relative positions of the Sun and Moon agreeing with observation. This is effected by increasing or diminishing the number of days, or the Moon's revolutions, or both; until the relative positions of the luminaries are obtained sufficiently correct. The adjustment in the days, must be made by
by compleat weeks, to preserve the order of the
days of the week from the commencement of the
*Calpa*.

47. The revolutions of the Moon in the cycle of
1080000 years corresponding to the number of days
above deduced = 14438321; but this number does
not give the relative positions of the Sun and Moon in
A.D. 1799, nearer than 3' 20'',5 of the truth, which
might be deemed sufficiently accurate by a *Hindu*
astronomer; but to render this still more correct, I find
by computation that two revolutions must be ad-
ded; and that the number of days in the cycle, must
be increased by sixty-three, or nine weeks; so that
the adjusted number of revolutions will then be
14438323, and the days corresponding = 394479135:
from which, we obtain the relative positions of the
Sun and Moon with respect to each other, within 6''
of what the *European* tables make them; a degree
of accuracy more than necessary in a *Hindu* system.

48. The number of mean solar days in the cycle
of 1080000 years, being thus finally adjusted, we get
the length of the year = $\frac{20440135}{1090000} = 365^{d}15^{m}30^{s}27''$;
and the instant at which the Sun enters Aries in the
*Hindu* sphere in A.D. 1799, according to mean
motions = $\frac{20440135 \times 4160}{1090000} = 1789766^{h}26^{m}45^{s}$ from
the commencement of the *Calu* *yug*. The
corrections introduced above (§ 47), make the year
come out a little longer, and the time of its com-
mencement somewhat later than we deduced from
the position of *Chitra* (§ 39); but this is of no
consequence whatever, the principal object in the
*Hindu* astronomy being to obtain the relative posi-
tions and motions of the Sun and Moon sufficiently
correct, for calculating the times of their conjunc-
tions, oppositions, and eclipses.

49. The
49. **The mean longitudes of the planets, being determined as by observation at the instant of the commencement of the year, and their mean annual motions, &c. thence deduced, as already explained (§ 12, 13, 14, 15, 16.) we obtain from thence the following revolutions in the cycle of 1080000 years.**

<table>
<thead>
<tr>
<th>Planet</th>
<th>Revolutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>1080000</td>
</tr>
<tr>
<td>Moon</td>
<td>14438323</td>
</tr>
<tr>
<td>Mercury</td>
<td>4484258</td>
</tr>
<tr>
<td>Venus</td>
<td>1755589</td>
</tr>
<tr>
<td>Mars</td>
<td>574209</td>
</tr>
<tr>
<td>Jupiter</td>
<td>91053</td>
</tr>
<tr>
<td>Saturn</td>
<td>36646</td>
</tr>
<tr>
<td>Days</td>
<td>394479135</td>
</tr>
</tbody>
</table>

And, the revolutions of the apsides and nodes in a *Calpa*, or 43200000000 years, will be as follows:—

<table>
<thead>
<tr>
<th>Apsides</th>
<th>Nodes—retrograde</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun - - 11985 direct</td>
<td>Moon - - 232808827</td>
</tr>
<tr>
<td>Mercury - 488114797 ditto</td>
<td>Venus - - 340671</td>
</tr>
<tr>
<td>Venus - 8014 retro.</td>
<td>Mars - - 299081</td>
</tr>
<tr>
<td>Mars - 28977 direct</td>
<td>Jupiter - - 315916</td>
</tr>
<tr>
<td>Saturn - 24642 retro.</td>
<td>Saturn - - 297301</td>
</tr>
</tbody>
</table>

50. **The revolutions of the Sun in the cycle = 1080000 subtracted from the revolutions of the Moon in the same period = 14438323 leave the number of mean lunations = 12358329, which being multiplied by 30, gives the number of tithis or lunar days = 400749690: and 400749690—394479135 = 6270555, the intercalary lunar days in the cycle. The number of sidereal days, or apparent revolutions of the fixed Sars = 394479135 + 1080000 = 395559135. The Moon’s periodical revolution, or the time in which she goes from the first**
first point of Aries to the same again \(= \frac{30\text{h}7\text{m}31\text{s}}{144}\) = 
\(27^\text{hr} 19^\text{m} 18^\text{s} 17''\) &c. and her synodical revolution or lunation \(= \frac{30\text{h}41\text{m}31\text{s}}{138}\) = \(29^\text{h} 31^\text{m} 50^\text{s} 7'' 02''\) &c. or according to the European expression \(29^\text{h} 31^\text{m} 50^\text{s} 7'' 02''\) &c. which does not differ the ninetieth part of a second from the length of a lunation by De la Lande's tables. The periodical revolutions of the planets may be had exactly in the same manner, by dividing the number of days in the cycle by the revolutions of each.

51. The system being now compleated, the mean longitudes of the Sun, Moon, and planets, are obtained from the revolutions above given (§ 49) in the manner already explained (§ 25); and their true longitudes, &c. are determined from thence by means of equations.

52. The equations of the orbits of the planets to be met with in Hindu books, differ considerably from those of Europeans, arising partly from the manner in which they are computed, partly from the inaccuracy of Hindu observation, and partly from their antiquity. For most of the Hindu astronomers for some ages back, appear to rest satisfied with merely copying the equations given in the books of those who preceded them. The equations now in general use appear to have been given by Varāha several centuries ago, and it is probable he copied them from the works of some still earlier astronomer.

53. Varāha has stated the obliquity of the ecliptic at twenty-four degrees, and the Hindu astronomers since his time, appear to adopt that quantity. But Varāha was not the first who gave the obliquity of the ecliptic at twenty-four degrees; for, it would appear that Brōhma Gupta, between five and six centuries before him, states it precisely the same. We are not, however, to conclude from hence, that the
the Hindu astronomer who first observed the obliquity of the ecliptic, and settled it at twenty-four degrees, must have lived so far back as the point of time when it was really so: for it is well known, that independent of errors in observations for want of proper instruments, the Hindu astronomers make it a rule in all cases, where extraordinary accuracy is not required, to reject fractional quantities, and take the nearest whole number; so that if the first Hindu astronomers found the obliquity to exceed $23^\circ 30'$, they would state it at $24^\circ$, as being sufficiently near for their purpose.

54. Therefore, in investigating the antiquity of any Hindu astronomical work, the quantities of the equations of the orbits of the planets, and that of the obliquity of the ecliptic must be rejected, as not only too incorrect for the purpose, but altogether fallacious; for, being as I have above stated (§ 52—53) copied from the works of the earlier astronomers, they cannot in the smallest degree add to the antiquity of the works into which they are so transcribed, except in delusive appearance only.

55. The aphelia and nodes of the planets being invisible points in the heavens, their positions and motions for want of proper instruments, have been but ill determined by the Hindu astronomers; and therefore, are to be rejected also: unless, where they are found to agree with the general result, deduced from the motions and positions of the Sun, Moon, and planets.

56. Having thus given a full and comprehensive view of the principles of the Hindu systems, with their formation, and pointed out all those delusive appearances which are apt to mislead; I shall now proceed to the investigation of the antiquity of the Surya Siddhanta.

57. The
57. The most correct and certain mode of investigating the antiquity of *Hindu* astronomical works, is by comparing the positions and motions of the planets computed from thence, with those deduced from accurate *European* tables. For, it must be obvious that every astronomer, let the principle of his system be what it will, whether real or artificial, must endeavour to give the true positions of the planets in his own time; or at least as near as he can, or the nature of his system will permit: otherwise his labour would be totally useless. Therefore, having the positions and motions of the Sun, Moon, and planets, at any proposed instant of time, given by computation from any original *Hindu* system; and having also their positions and motions deduced from correct *European* tables for the same instant; we can from thence, determine the point or points of time back, when their respective positions were precisely the same by both.

58. According to the *Surya Siddhanta*, the motion of the Moon's apogee in 100 years of 365°s. 15°s.

\[31' 31'' 24'' \text{ each } = \frac{488206 \times 100}{4920000} = 11 \text{ rev. } 3\]

By *De la Lande*'s tables for the same space of time,

in the *Hindu* sphere, \[= 11 \text{ rev. } 3 17 39 19,1\] Difference, the former greater by 42 10,9

Now, supposing the author of the *Surya Siddhanta*, to have accurately determined the position of the Moon's apogee, when he wrote that work; it must follow, that at the expiration of one hundred *Hindu* years from that time, the computed place of the apogee, would exceed the true by 42° 10,9; and at the end of two centuries, it would be double that quantity; so that the difference between the true, and computed places, has been ever since increasing in that proportion. Therefore, in order to ascertain the age of the *Surya Siddhanta*, we must find what
the difference amounts to at present; which being divided by the above difference, gives the time expired, since the Surya Siddhanta is supposed to have been written.

Thus, the longitude of the Moon's apogee at the end of the year 4900 of the Cali yug—

By the Surya Siddhanta = \( \frac{195584900 \times 488203}{4320000} \) = 221034461 rev. 11° 29' 33' 30''

By De la Lande's tables, Hindu sphere (§ 30) = 11 25 18 1,8

Difference in A. D. 1799 = 4 15 28,2

which being multiplied by 100, and divided by the difference in motion per century, we have \( \frac{49 15' 28,2 \times 100}{42 10,9} \) = 605 years, for the age of the Surya Siddhanta from this operation.

59. The motion of the Moon's ascending node for a century:—

By the Surya Siddhanta = \( \frac{232038 \times 100}{4320000} \) = 5 revolutions 4° 15° 19' 0''

By De la Lande's tables, Hindu sphere, = 4 15 51 48,7

Difference, the former less by = 32 48,7

Longitude of the Moon's ascending node at the end of the year 4900 of the Cali yug, in antecedentia:—

By the Surya Siddhanta = \( \frac{195584900 \times 232238}{4320000} \) = 105146017 rev. 11° 0' 13' 0''

By De la Lande's tables, Hindu sphere (§ 30) = 11 3 41 31,3

Difference, the former less by = 3 10 31,3

Hence, \( \frac{39 10' 31'' \times 3 \times 100}{32 48,7} \) = 580 years, for the age of the Surya Siddhanta from this operation: differing but twenty-five years from the former.
ON THE ANTIQUITY OF

60. The motion of the Sun's apogee in a century of Hindu years:
By the *Surya Siddhanta* = \( \frac{387 \times 100}{4320000000} \) = 0° 0' 0" 11.6
By De la Lande's tables, Hindu sphere, = 0 0 5 47.6
Difference, the former too slow by 5 36 0
Longitude of the Sun's apogee at the end of the year 4900 of the Cali yug:
By the *Surya Siddhanta* = \( \frac{1955884000 \times 387}{4320000000} \) = 175 rev. 2° 17' 17" 16'.

By De la Lande's tables, Hindu sphere (§ 30) = 2 18 35 49.8
Difference, the former less by 1 18 33.4
Hence, \( \frac{16,18,35,4 \times 100}{5,56} \) = 1105 years, for the age of the *Surya Siddhanta* from this operation.

61. The position of Mercury has been ill determined by the author of the *Surya Siddhanta*, probably from that planet being too near the Sun; for it will require about 1454 years yet to come, before the European tables and the *Surya Siddhanta* agree in giving it the same position; unless there are some inequalities in its motion not yet observed by European astronomers.

The motion of this planet for a century:—
By the *Surya Siddhanta*, = \( \frac{4434265 \times 100}{1060000} \) = 415 revolutions 2' 15" 30" 0'
By De la Lande's tables, Hindu sphere 2 16 1 34.3
Difference, the former too slow by 31 34.3
Mercury's mean longitude at the end of the year 4900 Cali yug:
By the *Surya Siddhanta* = \( \frac{4434265 \times 4900}{1080000} \) = 20345 revol. 3° 9" 30" 0"
By De la Lande's tables, Hindu sphere, (§ 12) - - 3° 15' 50' 13,5''
Difference, the former more advanced by - - - - 7 39 46,5
which is contrary to what it ought to be, had the observation been correct.

62. The mean motions of Venus for a century of Hindu years:—

By the Surya Siddhanta = \[ \frac{1755594 \times 100}{1080000} \]
= 162 revol. - - - - 6° 19' 48' 0''
By De la Lande's tables, Hindu sphere, - - - - 6 18 59 23,5
Difference, the former quicker by 48 36,5
Mean heliocentrick longitude at the end of the year 4900 of the Cali yug:

By the Surya Siddhanta = \[ \frac{1755594 \times 4900}{1080000} \]
= 7965 revol. - - - - 2° 10' 12' 0''
By De la Lande's tables, Hindu sphere, (§ 12) - - - - 2 3 18 45,5
Difference, the former more advanced by 6 58 14,5
Hence, \[ \frac{6° 38' 14'',5 \times 100}{48 36,5} \] = 860 years, for the age of the Surya Siddhanta from this operation.

63. The mean motions of Mars for a century of Hindu years:—

By the Surya Siddhanta = \[ \frac{574208 \times 100}{1080000} \]
= 53 revol. - - - - 2° 0' 16' 0''
By De la Lande's tables, Hindu sphere, - - - - 2 0 31 55
Difference, the former slow by 15 55
Mean longitude at the end of the year 4900 of the Cali yug:

By the Surya Siddhanta = \[ \frac{574208 \times 4900}{1080000} \]
= 2605 revol. - - - - 2° 13' 4' 0''
By
By De la Lande's tables, Hindu sphere (§ 12) - - 2° 18. 58' 11.5"
Difference, the former less advanced by 54 11.5
Hence, \( \frac{54'11''.5 \times 100}{15\frac{35}{36}} \) = 340 years, for the age of the Sūrya Siddhanta from this operation.

64. The mean motions of the Sun, Moon, Jupiter, and Saturn, are found by modern astronomers to be subject to inequalities, on account of the mutual attractions of the planets to each other; therefore, before we proceed farther, it will be proper to state here the formulae which have been given by M. De la Grange, De la Place, &c. for computing these inequalities.

FOR THE SUN.

Let \( n \), = the number of years before A.D. 1750,
then \( n^2 \times 0.00018408'' = \) the inequality according to the quantities given in De la Lande's tables, and is additive.

FOR THE MOON.

Let \( n \), = the number of years before A.D. 1700,
then \( n^2 \times 0.0011355'' - n^3 \times 0.000000044'' \) express the inequality which is additive in this case.

FOR JUPITER.

Let \( n \), = the number of years before A.D. 1750;
\( J \), = Jupiter's mean longitude; \( S \), = Saturn's mean longitude; then, \( + (20' 49'',5 - n. 0'',042733) \) \( \cdot \sin (5 S - .2 J. + 5' 34' 8'' - n. 58',88) \) express the inequality.

FOR SATURN.

Let \( n, J, S \), be as in the last; then, \( - (48' 44'' - n. 0'',1) \) \( \cdot \sin (5 S. - 2 J. + 5' 34' 8'' - n. 58'',88) \) will express the inequality.

65. From
65. From the position and motion of the Moon, we obtain 759 years, for the age of the Sūrya Siddhānta: as in the following operation:

$$4900 - 759 = 4141 \text{ Cali yug.}$$

Moon's mean longitude at the end of the year 4141 of the Cali yug:

By the Sūrya Siddhānta

$$= \frac{14438334 \times 141}{1050000}$$

$$= 55360 \text{ revs.} \quad 3 \text{ s. } 23 \text{° } 41' 52" 48''$$

By Delalande's tables at the end of the year 4900 of the Cali yug, Hindu sphere, (§ 12) = 3\° 2' 40" 48''

Deduct motion for 759 Hindu years and sphere = 11 8 27 45 16

Mean longitude at the end of 4141 of the Cali yug = 3 23 34 55 32

Add inequality in Moon's motion, per formula for 660 years = 7 52 24,7

Correct mean longitude = 3 23 42 47 56,7

Deduct inequality in Sun's motion per formula, for 710 yrs = 54 58,7

Moon's correct mean longitude, Hindu sphere = 3 23 41 53 17,9

agreeing with the Sūrya Siddhānta within half a second, or 29,9

Or the operation may be as follows, in the European sphere.

Moon's mean longitude at the end of the year 4900 of the Cali yug:

By Delalande's tables, Eur.

sphere, (§ 11) = 3\° 22' 55'' 9" 18''

Deduct motion for 759 Hindu years, but European sphere = 11 20 49 56 25,77

Mean longitude at the end of the year 4141 of the Cali yug = 4 2 5 12 52,2

Add inequality per formula for 660 years = 7 52 24,7

Correct
ON THE ANTIQUITY OF
Correct mean longitude, end of
4141 Cali yug, in Eur. sphere 4° 21' 5" 16,9"

Now, in order to reduce this to the Hindu sphere, we must find what the Sun's mean longitude was at that time, as follows:
Sun's mean longitude at the end of the year 4900 Cali yug:

By De la Lande's tables, Eur.
sphere, (§ 11) = 0° 20' 52" 28" 30"
Deduct motion for 759 Hindu years = 0 12 22 11 9,7
Sun's mean longitude at the end of the year 4141 = 0 8 30 17 20,2
Add inequality per formula for 710 years = 54 38,8
Correct mean longitude, European sphere = 0 8 31 11 59,0
But the Sun's mean longitude in the Hindu sphere at that instant was = 0 0 0 0 0
Consequently the difference of the spheres = 0 8 31 11 59,0

Now, from the Moon's correct mean longitude = 4 2 13 5 16,9
Subtract diff. of the spheres = 0 8 31 11 59,0
Remain Moon's mean longitude Hindu sphere = 3 23 41 53 17,9
the same as before.

66. From Jupiter's position and motions, we obtain 875 years, for the age of the Surya Siddhānta: 4900—875 = 4025 of the Cali yug.
Jupiter's mean longitude at the end of the year 4025 of the Cali yug:

By the Surya Siddhanta = \frac{91035 \times 4025}{1050000} = 339 \text{ rev.} = 4° 5° 27' 30" 00"
Jupiter's
Jupiter's mean longitude at the end of the year 4900 of the *Cali yug* :-

**By De la Lande's tables, Hindu sphere, (§ 12)**

\[ = 1^\circ 9\ 5' 33'' 36'' \]

Deduct motion for 875 *Hindu* years and sphere

\[ = 9\ 3\ 56\ 12\ 37 \]

Mean longitude end of the year 4025 *Cali yug*,

\[ = 4\ 5\ 9\ 20\ 59 \]

Add inequality in Jupiter's motion per De la Lande's tables

\[ = 19\ 22\ 36 \]

Sum,

\[ = 4\ 5\ 28\ 43\ 35 \]

Deduct inequality in the Sun's motion, for 826 years

\[ = 1\ 14\ 0 \]

Jupiter's correct mean longitude, *Hindu* sphere

\[ = 4\ 5\ 27\ 29\ 35 \]

being the same with the *Surya Siddhanta* within less than half a second.

67. From Saturn we get 805 years.

4900—805 = 4095 of the *Cali yug*.

Saturn's mean longitude at the end of the year 4095 of the *Cali yug* :-

**By the Surya Siddhanta**

\[ = \frac{36642 + 4095}{100000} = 138 \text{ rev.} = 11^\circ 6' 19' 48'' 00'' \]

Saturn's mean longitude at the end of the year 4900 of the *Cali yug* :-

**By De la Lande's tables, Hindu sphere (§ 12)**

\[ = 3' 3'' 24' 27'' 36'' \]

Deduct motion for 805 *Hindu* years and sphere

\[ = 3\ 26\ 30\ 21\ 23 \]

Remain Saturn's mean longitude

\[ = 11\ 6\ 54\ 6\ 13 \]

Deduct inequality in motion per De la Lande's tables

\[ = 33\ 9\ 0 \]

Remain

\[ = 11\ 6\ 20\ 57\ 13 \]

Deduct inequality in Sun's motion per formula

\[ = 1\ 1\ 57 \]

Saturn's correct mean longitude, end of 4095 of the *Cali yug* = 11 6 19 55 16 20 4 and
agreeing with the *Surya Siddhānta* within seven seconds.

68. From the aphelion of Mars we get 641 years for the age of the *Surya Siddhānta*:

Thus, the longitude of the aphelion of Mars at the end of the year 4900 of the *Cali yug*:

By the *Surya Siddhānta* = \( \frac{1955884900 + 204}{43200000} \)

\[ 92 \text{ rev.} \]

4° 10' 2" 35' 54"

By De la Lande's tables *Hindu*

sphere (§12) 4 11 30 57 30

Difference, the former less advanced by 1 28 21 6

Mean motion per century of *Hindu* years.

By the *Surya Siddhānta* = 0 0 0 6 7

By De la Lande's tables, *Hindu*

sphere = 0 0 13 53 3

Difference, the former slow by 0 0 13 46 56

Hence, \( \frac{1028'21''36''+100}{13 46 56} = 641 \text{ years.} \)

69. From the length of the year = 365°15'31"24", we get 736 years, for the age of the *Surya Siddhānta*:

Thus, in the formula \( \frac{d}{h}, = n \) (§ 41) we have

\( d = 9°52'39'16''; \quad h = 365°15'32''24''; \) and

\( s = 365°15'22'59''. \) Hence \( \frac{d}{h}, = n = \frac{9°52'39'16''}{8 32 24} = 4164 \text{ of the *Cali yug*, when the year was of the given length. Therefore 4900} - 4164 = 736 \text{ years, the age of the *Surya Siddhānta*.} \)

70. Let the results of the foregoing operations be now collected together, in order to obtain a mean of the whole: and we shall have

From
From the Moon's apogee (§ 58) - 605 years.
Sun's apogee (§ 60) - - 1105
Venus (§ 62) - - 860
Mars (§ 63) - - 340
Moon (§ 65) - - 759
Jupiter (§ 66) - - 875
Saturn (§ 67) - - 805
Mars's aphel. (§ 68) - - 641
Length of the year (§ 69) - - 736

Sum = 7306

which being divided by 10, the number of results, we get 730.6—or 731 years nearly for the age of the Surya Siddhánta: which differs but about five years from the age deduced from the length of the year only.

71. But independent of all calculations we know from Hindu books, the age in which the Surya Siddhánta was written; and by whom. In the commentary on the Bhasvoti, it is declared, that Vara'ha was the author of the Surya Siddhánta. The Bhasvoti was written in the year 1021 of Saka, by one Sotanund, who, according to Hindu accounts, was a pupil of Vara'ha, and under whose directions he himself acknowledges he wrote that work. Consequently, Vara'ha must have been then alive, or else a very short time before it: which agrees as near as possibly can be, with the age above deduced; for, the Bhasvoti in A. D. 1799, will be exactly 700 years old.

72. That Vara'ha, was the real author of the Surya Siddhánta, is still further confirmed by one of his works in my possession, entitled Jatok Arnob; the mean age of which comes out by computation 739 years. In this work, as in the Surya Siddhánta, the
ON THE ANTIQUITY OF

the Sun, Moon, and planets, are assumed to have been in a line of mean conjunction, in the first point of Aries at the commencement of the Cali yug, on the meridian of Lanca, and the mean annual motions, by both, are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Jatok Arnob.</th>
<th>Surya Siddhánta.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>0° 0' 0''</td>
<td>0° 0' 0''</td>
</tr>
<tr>
<td>Moon</td>
<td>4° 24 40 47</td>
<td>4° 12 40 48</td>
</tr>
<tr>
<td>Mercury</td>
<td>1° 24 45 18</td>
<td>1° 24 45 18</td>
</tr>
<tr>
<td>Venus</td>
<td>7° 15 52 48</td>
<td>7° 15 11 52 48</td>
</tr>
<tr>
<td>Mars</td>
<td>9° 36</td>
<td>9° 24 24 9 36</td>
</tr>
<tr>
<td>Jupiter</td>
<td>1° 01 6 0</td>
<td>1° 01 6 0</td>
</tr>
<tr>
<td>Saturn</td>
<td>0° 12 50 20</td>
<td>0° 12 12 50 24</td>
</tr>
</tbody>
</table>

Annual motion of the Moon's apogee.

By the **Jatok Arnob** - 1° 10' 41'' 0'' 54' .541/772.547
By the **Surya Siddhánta** - 1° 10 41 0 54

Annual motion of the Moon's node.

By the **Jatok Arnob** - 0° 19 21 11 24
By the **Surya Siddhánta** - 0° 19 21 11 24

Length of the year.

<table>
<thead>
<tr>
<th></th>
<th>Jatok Arnob.</th>
<th>Surya Siddhánta.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>365 15 31 31 24 25</td>
<td>365 15 31 31 24 24</td>
</tr>
</tbody>
</table>

73. Now comparing the quantities of the motions, &c. deduced from these works with each other, it will evidently appear, that one person must have been the author of both: for, though the quantities are not exactly the same, yet the differences are too small to admit of a supposition of their being the works of two different persons. In fact, the small difference between the **Jatok Arnob** and **Surya Siddhánta**, appears to be owing to the system being completed in the one, and not in the other. For, if we multiply
multiply the mean motions, &c. given in the *Jatok Arnob* by 1080000 (the least cycle of years in which the Sun, Moon, and planets are assumed to return to a line of mean conjunction by the *Surya Siddhānta*) we shall have (rejecting the fractions and taking the nearest whole number) the same revolutions precisely as are given in the *Surya Siddhānta* (§ 22). This much may serve to shew who the real author of the *Surya Siddhānta* was: but, if any further documents should be deemed requisite, a reference to almost any of the principal astronomical works, written since the time of *Vāraḥa*, must be sufficient. For, in the *Brohmac Siddhānta, Vishnu Siddhānta, Siddhānta Munjeri*, and many others, that system or *Calpa* which is contained in the *Surya Siddhānta*, is expressly called the *Calpa* of *Vāraḥa*: or, as some express it, "the *Calpa* of *Vāraḥa* the fair." Therefore, any Hindu work in which the name of *Vāraḥa* or his system is mentioned, must evidently be modern; and, this circumstance alone totally destroys the pretended antiquity of many of the *Purans* and other books, which through the artifices of the *Brahminical* tribe, have been hitherto deemed the most ancient in existence.

74. From what has been said above, it appears extremely probable, that the name of *Vāraḥa*, must have been to the *Surya Siddhānta* when it was first written, and the author well known; but that after his death, priestcraft found means to alter it, and to introduce the ridiculous story of *Meya* or *Moya*, having received it through divine revelation at the close of the *Satya yug*; upon which petty fiction its present pretended antiquity is founded. But this it seems was not the only pious fraud committed by the crafty sons of *Brahma*; for it appears that a number of other astronomical works were then framed, calculated also for the purpose of deception among
among these, some were pretended to be delivered from the mouth of one or other of their deities, as the Brohma Siddhánta, Vishnu Siddhánta, and the works of Siva, commonly called Tontros. Others, were pretended to have been received through revelation, as the Soma Siddhánta, while others were fathered on sages, who were supposed to have lived in the remotest periods of antiquity, as the Vasishtha Siddhánta, Parásar Siddhánta, Rudra Siddhánta, Gorgá Siddhánta, Bhargob Siddhánta, &c. to the number of about eighteen altogether, including the Surya Siddhánta. These eighteen are now called by way of pre-eminence, the eighteen original Shastres of astronomy, though amongst the whole I am informed, there are not above three or four real original works; the rest being compiled for one or other of these, with the diction or style a little altered, to answer the purposes of priestcraft; but the revolutions, motions, &c. of the planets, remaining the same as in the original.

75. These books, are however, become now very scarce; at least in this part of India; so much so, that it was with a great deal of difficulty I procured the following out of the number, viz. the Soma Siddhánta, Brohma Siddhánta, Vishnu Siddhánta, Vasishtha Siddhánta, and the Groho Jamul, one of the works pretended to have been written by Siva: but even from these few, a general idea may be formed of the antiquity of the rest.

The Soma Siddhánta, Vasishtha Siddhánta, and Groho Jamul, adopt the system given in the Surya Siddhánta by Varaha. The Brohma Siddhánta appears to have been deduced from the Bhascoti, by calculating from that work the positions of the Sun, Moon and planets, at the commencement of the Calpa of Brohma, and making the calculations to commence from that epoch
epoch instead of the year 1021 of Saka, the date of the Bhasvoti. The Vishnu Siddhánta differs in nothing from the Brohma Siddhánta except in the epoch from which the calculations are directed to be made; being the commencement of the Culpa of Varaṇaha. Hence, these books are evidently modern forgeries. The Parásar Siddhánta, I am informed, has been taken from the Brohma Siddhánta, in the same manner, as that of Vasishta has been taken from the Surya Siddhánta.—Indeed, there is reason to suspect that the whole of the works attributed to Parásar, are forgeries of a very modern date: I have now in my possession a work pretended to be his, entitled "Krist Parásar" (i.e. Parásar on agriculture) which is a most palpable forgery. This insignificant little work contains more of astrological nonsense and predictions, than of real husbandry; nothing of any moment can be undertaken; the ground cannot be ploughed; nor the corn sown; without first examining the state of the heavens, to know if the time be lucky or not; but what discovers the imposition, are certain astrological rules given in the body of the work.—Thus, to calculate the governing planet or Raja for the year; the author says, "multiply the year of Saka by 3, to the "product add 2, divide the sum by 7, and the re-"mainder will shew the governing planet or Raja "for the year, to which if you add 3 (deducting 7 "if the sum admit), you will have its prime minister."*

The name "Saka" shews the forgery, for Parásar is supposed to have lived several centuries before the era of Saka or Suliban.

76. The Bhasvoti, I believe, was originally calculated for the meridian of Siam, and was introduced

into this part of India, as appears from the formula for calculating the Sonkranti, about the year 1190 of Saka; or 167 years after its date—The formula given in the Brohma Siddhanta for calculating the Sonkranti for Bysack, (i.e. the instant the Sun enters aries according to true motions) makes the time come out later by one Hindu minute, than the Bhasvoti. Hence, supposing that the formula of each when written, was regulated or made to agree with the Surya Siddhanta, which was then the standard work; the Brohma Siddhanta must have been deduced from the Bhasvoti, about 43 years after its introduction into this part of India: or about the year 1233 of Saka. This conjecture, if true, may be of use in pointing out the epoch of the forgeries of their eighteen Siddhantas, &c. as it is probable, the whole may have been done nearly about the same time, to answer some particular purpose the Brahmins might have then in view.

77. The mean annual motions of the Sun, Moon and planets, according to the Bhasvoti, Brohma Siddhanta, Vishnu Siddhanta, and some others, are as follow:

<table>
<thead>
<tr>
<th>Hindu Sphere</th>
<th>Sun</th>
<th>Moon,</th>
<th>Mercury</th>
<th>Venus,</th>
<th>Mars,</th>
<th>Jupiter,</th>
<th>Saturn,</th>
<th>Moon's Apogee</th>
<th>Node</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0°</td>
<td>0°</td>
<td>0°</td>
<td>0°</td>
<td>0°</td>
<td>0°</td>
<td>0°</td>
<td>0°</td>
<td>0°</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>12° 46</td>
<td>24° 46</td>
<td>37° 54</td>
<td>15° 11</td>
<td>11° 24</td>
<td>10° 44</td>
<td>19° 21</td>
</tr>
</tbody>
</table>

78. The length of the year, according to the above-mentioned works, is 365° 15° 31° 30°; hence we get the following mean motions of the Sun, Moon
Moon and planets, in that space of time, from De la Lande's tables:

<table>
<thead>
<tr>
<th></th>
<th>European sphere.</th>
<th>reduced to Hindu sphere.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>0° 0' 0&quot; 58&quot;,648</td>
<td>0° 0' 0&quot; 0&quot;</td>
</tr>
<tr>
<td>Moon</td>
<td>4 12 47 38,9765</td>
<td>4 12 46 40,3285</td>
</tr>
<tr>
<td>Mercury</td>
<td>1 24 46 35,51</td>
<td>1 24 45 36,8620</td>
</tr>
<tr>
<td>Venus</td>
<td>7 15 12 22,2097</td>
<td>7 15 11 23,5617</td>
</tr>
<tr>
<td>Mars</td>
<td>6 11 25 17,8082</td>
<td>6 11 24 19,1602</td>
</tr>
<tr>
<td>Jupiter</td>
<td>1 0 21 47,1505</td>
<td>1 0 20 48,5025</td>
</tr>
<tr>
<td>Saturn</td>
<td>0 12 14 8,0193</td>
<td>0 12 13 9,3713</td>
</tr>
<tr>
<td>Moon's Apogee</td>
<td>10 41 34,25</td>
<td>10 40 35,6020</td>
</tr>
<tr>
<td>Node</td>
<td>0 19 20 52,41</td>
<td>0 19 21 51,0580</td>
</tr>
</tbody>
</table>

By comparing these motions with those in § 77, some idea may be formed of the antiquity of the works; but as the Brohma Siddhánta and Vishnu Siddhánta, take notice of the Calpa of Varāha, it is clear that neither of them can possibly be older than the time of that astronomer.

79. The Sun's apogee, and the aphelia of the planets have no motion according to these works; nor do they make a conjunction of the planets at the commencement of the Cali yuga; beginning of either Calpa; or at any other period.

80. The next astronomer of any considerable note we meet with after Varāha and Sōtanund, is Bhāsker Acharya. This man according to the Totvochintamoni was born in the year 1036 of Saka, and in the year 1072, wrote or compiled his astronomical work called the Siddhanta Siromoni, in which he adopted the numbers of Brohma Gupta. He also wrote or compiled several other works,
works, some of which are yet extant, as the *Lila Voti* and *Beej Gonita*; the former on mensuration, the latter on algebra.

81. From the revolutions of the Sun, Moon, and planets, &c. in a *Calpa* according to *Brohna Gupta*, (§ 21), we obtain the following mean annual motions:

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moon</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mercury</td>
<td>-</td>
<td>1</td>
<td>24</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venus</td>
<td>-</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mars</td>
<td>-</td>
<td>6</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jupiter</td>
<td>-</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturn</td>
<td>-</td>
<td>0</td>
<td>12</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moon's Apogee</td>
<td>10</td>
<td>40</td>
<td>31</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Node</td>
<td>19</td>
<td>21</td>
<td>33</td>
<td>21</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

which motions being reckoned from the commencement of the *Calpa* of *Brohna*, gave the positions of Sun, Moon and planets, with those of the Moon's apogee and node in the time of the author of the system, as near as he could determine them by observation. *This Calpa of Brohna Gupta, is made to commence with Sunday at the instant of Sun-rise on the meridian of Lanka.*

82. The number of mean solar days assigned to this *Calpa*, is 1577916450000: And the length of the year therefore \[\frac{1577916450000}{43200000000} = 395^d. 15^m. 30^s. 22'' 30''\]; hence we have the following mean motions of the Sun, Moon and planets, &c. from *De la Lande's* tables, in that space of time.
83. The mean motions of the Sun, Moon and planets, &c. for 100 Hindu years;

<table>
<thead>
<tr>
<th>By the System of Brohma Gupta.</th>
<th>De la Lande's Tables.</th>
<th>Difference, the former + or —</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun</td>
<td>0° 0° 0° 0°</td>
<td>0° 0° 0° 0°</td>
</tr>
<tr>
<td>Moon</td>
<td>10 17 30 0</td>
<td>10 17 24 21,1</td>
</tr>
<tr>
<td>Mercury</td>
<td>2 14 59 29,5</td>
<td>2 15 55 37,1</td>
</tr>
<tr>
<td>Venus</td>
<td>6 19 54 44,8</td>
<td>6 18 58 12,1</td>
</tr>
<tr>
<td>Mars</td>
<td>2 0 14 15,7</td>
<td>2 0 32 48,1</td>
</tr>
<tr>
<td>Jupiter</td>
<td>5 5 13 18,6</td>
<td>5 4 45 51,3</td>
</tr>
<tr>
<td>Saturn</td>
<td>4 21 23 38,9</td>
<td>4 21 57 23,7</td>
</tr>
<tr>
<td>Moon's Apogee</td>
<td>3 17 32 55,7</td>
<td>3 17 40 59,1</td>
</tr>
<tr>
<td>— Node</td>
<td>4 15 55 35</td>
<td>4 15 49 49,9</td>
</tr>
<tr>
<td>Sun's Apogee</td>
<td>14,4</td>
<td>7 41,3</td>
</tr>
</tbody>
</table>

84. The year 4900 of the Cali yug, according to this system will end on the 11th April 1799, at 15' past two P. M. on the meridian of Lanka: at which instant the mean longitudes of the Sun, Moon and planets, &c. will be
According to
Brohma Gupta. Hindu Sphere.

<table>
<thead>
<tr>
<th>Sun's mean Longitude</th>
<th>De la Lande Hindu Sphere.</th>
<th>Difference the former + or —</th>
<th>Age deduced.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5° 0' 0&quot;</td>
<td>5° 0' 0&quot;</td>
<td>+ 1° 27' 42.4&quot;</td>
<td>1183 Years</td>
</tr>
<tr>
<td>Moon's ditto</td>
<td>2° 17' 30&quot;</td>
<td>- 15° 45' 53.6&quot;</td>
<td>1685 Years</td>
</tr>
<tr>
<td>Mercury's ditto</td>
<td>2° 11' 29&quot; 35,3&quot;</td>
<td>+ 11° 59' 36.2&quot;</td>
<td>1272 Years</td>
</tr>
<tr>
<td>Venus's ditto</td>
<td>2° 14' 24&quot; 47,6&quot;</td>
<td>- 3° 51' 57.7&quot;</td>
<td>1250 Years</td>
</tr>
<tr>
<td>Mars's ditto</td>
<td>2° 10' 42&quot; 37,7&quot;</td>
<td>+ 4° 59' 4.4&quot;</td>
<td>1036 Years</td>
</tr>
<tr>
<td>Jupiter's ditto</td>
<td>1° 15' 15&quot; 44,8&quot;</td>
<td>- 7° 34' 6.8&quot;</td>
<td>1254 Years</td>
</tr>
<tr>
<td>Saturn's ditto</td>
<td>2° 27' 5&quot; 21,7&quot;</td>
<td>+ 1° 5' 34.6&quot;</td>
<td>814 Years</td>
</tr>
<tr>
<td>Moon's apogee</td>
<td>1° 25' 23&quot; 16,9&quot;</td>
<td>+ 1° 15' 57.3&quot;</td>
<td>1320 Years</td>
</tr>
<tr>
<td>node sup.</td>
<td>1° 3' 35&quot; 34,6&quot;</td>
<td>+ 1° 56' 6.9&quot;</td>
<td>1559 Years</td>
</tr>
<tr>
<td>Sun's apogee</td>
<td>2° 17' 57&quot; 21,6&quot;</td>
<td>-</td>
<td>—</td>
</tr>
</tbody>
</table>

Sum of the several ages deduced — — = 11373

Mean age of the system of Brohma Gupta = 1264²⁵⁸ yrs.

85. The revolutions of the equinoxes in a Calpa according to this system are 199669. Hence the annual precession, \(\frac{199669}{4320000000} = - 59°,9007\)

De la Lande’s tables make it (§ 82) 57°, 539

Difference — — — 2°,3617

In the Groho Laghob, written in the year 1442 of Saka, by Gonesh son of Kesoro, the annual precession is stated at one minute; and at the end of the year 444 Saka, or 3623 of the Cali yug, the first point of aries in the Hindu sphere was supposed to have coincided with the vernal equinox. I mention these circumstances merely to shew that the quantity of the annual precession, and the point from whence it is computed, are not the same in all Hindu books of astronomy.

Having thus given a general outline of the Hindu systems of astronomy at present in use, with their formation, and the principles on which they are founded;
founded; I shall now close the subject with the following tables and precepts for calculating the commencement of the Hindu years and months, according to astronomical and civil reckonings, and the corresponding times in the European calendar.

The instant the Sun enters a sign, is called by the Hindus Sonkranti; and at that moment the astronomical month begins. If the Sun enters a sign between Sun-rise and midnight, the civil month will begin at the following Sun-rise. But if the Sun enters a sign between midnight and Sun-rise it is then called Kot Sonkranti, and the whole of the following day and night belong to the preceding civil month.

The astronomical day, in this part of India, is reckoned from midnight to midnight, and begins at the equator six hours earlier than the civil day of the same name: the civil, begins at Sun-rise, and continues to the Sun-rise following.

The following tables are constructed to shew the time elapsed of the day according to civil reckoning; (or rather from six A.M.)—so that if you add fifteen dondos, you have the time expired from midnight:—the Hindu parts of a day, are converted into European hours, minutes, &c. by multiplying by 2 and dividing the product by 5, and vice versa.
ON THE ANTIQUITY OF

**TABLE I.**

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<th>Years</th>
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This table has been computed from the length of the year given in the Bhavoti, Brhma Siddhanta, &c. In Hindu tables of this kind, the days are divided by 7, and the remainder only set down; which renders them more commodious and expeditious in practice; however, such would not answer our purpose, for we must have the days entire, in order to get the corresponding time in the European calendar, from the excess of the Hindu above the Julian reckoning, which amounts to 7 days in 800 years.

**TABLE II.**

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In leap years after February take out one day less.

**Remarks.** If the number of days given exceed 365, take the difference, and with that find the

**2 P 3**

month
month and day: 2d. If the number given, falls in the table before the day on which Bysack begins,—the month and day of the month corresponding will belong to the year following; and must be dated accordingly.

I. To find the instant the Sun enters a sign or the Sonkranti.

Precept. With the years expired of the Cali yug enter Table I, and take out the days, &c. corresponding: take from Table II, the days, &c. opposite the given month, and add them to the former: divide the days thus found by 7, the remainder will shew the day of the week, and the fraction the time elapsed from 6 A. M. when the Sun enters the sign according to true motions.

II. To find the day on which the civil month begins.

Precept. If the Sun enters the sign between sun rise and midnight, add 1 to the day of the week on which the Sonkranti falls; but if between midnight and sun rise add 2, and the sum will be the day of the week on which the civil month begins at sunrise.

III. To find the corresponding time, according to the European calendar.

Precept. 1. To the number of days found from Tables I, and II, add 1 or 2, according as the Sonkranti happens to fall before or after midnight as in the last, and reserve the sum. 2. To the years expired of the Cali yug add 3, and divide the sum by 4: add to the quotient the years expired of the Cali yug, and subtract the sum from that which you reserved.
reserved. 3. With the remainder enter Table III, and take out the month and day corresponding, which will be the month and day of the month of the European calendar, on which the Hindu civil month begins at Sun rise according to Old Style.

IV. To find the year before or after the Christian era, corresponding to any year of the Cali yug.

Precept. The Cali yug began 3102 years before the commencement of the Christian era, or 3101 before the year of Christ's birth: therefore, if the years expired of the Cali yug exceed 3102, the excess + 1, will be the current year of the Christian era in which the first month Bysack of the current Hindu year begins. 2. If the years fall short of 3102, the difference will be the years before the Christian era: or the difference — 1, will be the years before the year of Christ's birth.

EXAMPLE I.

Required the day of the week and day of the month of the European calendar, corresponding to the first of Bysack in the year 4901 of the Cali yug?

Years expired = 4900, and 4900 + 1 — 3102 = A.D. 1799.

Table I. For 4000 = 5035 0 0 Sum 6171 + 1 = 6172

900 = 1132 52 30

Table II. Bysack = 3 39 42 Add 4900

Sum, = 6171 32 12 Sum, = 6125

Sonkraati, Wednesday, 4 32 12 Difference = 31st March O.S. 47

Add per precept, 1 Add diff. between O.&N.S. = 11

Bysack begins on Thursday 5 0 0 Sum = 11th April, 1799, N.S. = 58

The days of the week are always expressed by figures, as, 1 for Sunday, 2 for Monday, &c.

EXAMPLE II.

Required the day of the week and day of the month of the European calendar, corresponding to the 1st of Cartick, in the year 4901 of the Cali yug?

Years
Years expired as in the last.

Table I. For $4000 = 5035$ 0 0 | Sum $6358 + 1$ - - = 6359
900 = 1132 52 30 | $\frac{4900+3}{4} = 1225$

Table II. Cartick = 190 34 54 | Add 4900
Sum - 6358 27 24 | Sum, - - 6125
Soukranti, Monday, 2 27 24 | Difference = 4th October, O.S. 234
Add - - 1 | Difference of style add 11
1st Cartick, on Tuesday, 3 | Sum, = 15th October. N.S. = 245

EXAMPLE III.

**Required** the day of the month, &c. on which the 1st of Choitro in the year 4901 falls?

Table I. For $4900 = 6167$ 52 30 | Sum, - - 6507
Table II. Choitro = 338 32 57 | Deduct as above - 6125
Sum, - 6506 25 27 | Remainder, - 382
Add - 1 | Deduct 1 year - = 365
Sum, - 6507 | Remainder, - - 17
1st Choitro, on Wednesday = 4 | which per Table III = 1st March

O. S. or 12th March, N. S. A. D. 1800.

EXAMPLE IV.

**Required** the day of the week and day of the month of the *European* calendar, corresponding to the 10th of Cartick in the year 1711 of the *Cali* yug?

Years expired = 1710, and 3102 — 1710 + 1 = B. C. 1391.

Table I. For $1000 = 1258$ 45 0 | The 10th Cartick - = 2353
700 = 881 7 30 | $\frac{1710+3}{4} = 428$
10 = 12 35 15 | Add - 1710

Table II. Cartick = 190 34 54 | Sum - - - = 2138
Sum - 2343 2 39 | Difference - - = 215
Add - 1 | Which per Table = 15th Sept.
1st Cartick - = 2344 | O. S. diff. between O. & N. S.
Add - 9 | was then = - 12
10th Cartick - = 2353 | Therefore 215 — 12 = 203
Which falls on Sunday - = 1 | Which per Table = 3d Sept. N. S.

**When**
When the Sonkranti happens to fall at or near midnight, the Hindu astronomers (or rather calculators of almanacks) not unfrequently differ amongst themselves with respect to the day on which the civil month begins: some making it later or earlier than others by a day, according to the works or tables from which each makes his computation. But independent of this irregularity, there is another which probably arises from local custom: in some of the Nuddea calendars, the civil month is invariably made to begin at the Sun-rise immediately following the instant of the Sonkranti, whether the same happens before or after midnight.—On the other hand, most of the calendars calculated in and about Calcutta, and at Balia, make the month begin a day later when the Sun enters the sign after midnight, agreeable to the rules above laid down.
APPENDIX.

RULES OF THE ASIATICK SOCIETY.

SIR WILLIAM JONES, the revered founder of the Society, in his Discourse, delivered on the 15th February, 1784, and published in the first volume of these Researches, recommended that in the infancy of the Society, there should be no formal rules. Accordingly none were passed, but the suggestions in the above discourse were unanimously adopted, and having been since uniformly acted upon, they may be considered the original rules of the institution. They were, in substance, as follow:

I. That the Institution be denominated the Asiatick Society; that the bounds of its investigations be the geographical limits of Asia; and that within these limits, its inquiries be extended to whatever is performed by man or produced by nature.

II. That weekly meetings be held for the purpose of hearing Original Papers read, on such subjects as fall within the circle of the Society’s inquiries.
III. That all curious and learned men be invited to send their tracts to the Secretary; for which they shall immediately receive the thanks of the Society.

IV. That the Society's Researches be published annually, if a sufficiency of valuable materials be received.

V. That mere translations of considerable length be not admitted, except of such unpublished essays or treatises as may be transmitted to the society, by native authors.

VI. That all questions be decided on a ballot, by a majority of two-thirds, and that nine members be required to constitute a board for such decisions.

VII. That no new member be admitted who has not expressed a voluntary desire to become so; and in that case, that no other qualification be required, than a love of knowledge, and a zeal for the promotion of it.

The foregoing are the only general points noticed in the Founder's Discourse, but an additional rule was introduced by him, and has been since continued, in proposing and electing new members, viz. That the proposition having been made and seconded, the election take place by ballot, at the next meeting. This rule has also been considered applicable to all questions of importance.

On the 19th of August, 1796, a meeting of the Society was held, for the special purpose of considering the best means of rendering the Institution permanent, and for determining whether a House should be provided for the future meetings of the Society, when it was

Resolved.
Resolved,

1st. That application be made to his Majesty, for a Charter of Incorporation for this Society.

2d. That a House be provided, for the use of the Society.

3d. That a Committee be appointed to consider the best mode of carrying into execution the objects of the two foregoing resolutions, and to report their opinion at the next meeting of the Society.

4th. That the Committee be requested to consider any rules and regulations for advancing and promoting the objects of the Institution of the Society, and lay them before the Society for their determination at a future meeting.

On the 29th of September 1796, the Committee elected on the 19th of August submitted the following propositions which were unanimously adopted by the Society.

1st. That the intended application to his Majesty to obtain a Charter of Incorporation for the Society; be made through the Governor General in Council and the Court of Directors.

2d. That the best mode of carrying into execution the second resolution of the Society on the 19th August, will be, by building a commodious house, as soon as the funds requisite shall be provided.

3d. That, in order gradually to establish funds for that purpose, and for defraying the necessary current expenses of the Society, an admission fee be established; and that, as none of the present Members of the Society, have hitherto paid any fees, those resident
resident in India contribute two gold mohurs in lieu thereof.

4th. That a like sum of two gold mohurs be paid in future by every new Member as an admission fee on his election.

5th. That every Member of the Society, resident in India, (honorary Members excepted) pay four gold mohurs per annum, quarterly, in the first week of January, April, July, and October, and any Member neglecting to pay his subscription for half a year after it becomes due, be considered as no longer belonging to the Society.

6th. That as admission fees and quarterly contributions would not, under a long course of time, afford funds sufficient to build a house, a subscription for voluntary contributions be opened, and application made to Government for a convenient spot of ground, as a site for the proposed Building.

7th. That a Treasurer be elected.

8th. That as frequent meetings would tend to promote the general objects of the Society, weekly meetings be established, as soon as the building intended for the purpose shall be finished; and that, in the mean time, a meeting of the Society be held at least once in a month.

9th. That, as it may not always be convenient for the President to attend on such occasions, it is advisable to elect first and second Vice Presidents annually.

10th. That the Society appoint a Committee of Papers, consisting of the President, Vice Presidents, and Secretary, for the time being, together with five other Members, to be elected annually; and that this Com-
Committee shall select the papers for publication, and superintend the printing of the Transactions of the Society.

11th. That the Society make it publickly known, that it is their intention to establish a Museum and Library, and that donations of books, manuscripts, and curiosities, will be thankfully received and acknowledged.

The five first volumes of the Society's Researches were published by the Superintendents of the Honourable Company's Press, for the produce of their sale; but on the 3d of May 1798, the Society resolved as follows:

1st. That the Transactions be hereafter published at the expence, and on account of the Society; both, as the Society has now a fund which may be applied to that purpose, and as by this means the Society will be enabled to publish any number of engravings that may be thought necessary to illustrate the Papers, as well as to regulate the price, and thereby extend the circulation of them.

2d. That the Transactions be published in India, as more convenient for the superintendence of the Press, as well as being more suitable to an Asiatick Society; and that the mode of publication, with all other details, be left, as heretofore, to the Committee of Papers.

3d. That the Committee of Papers be authorized to draw upon the Treasurer for any sums requisite to defray the expence of publishing the Transactions; and that an order, signed by a majority of the Committee, be a sufficient warrant to the Treasurer for paying the same.

23d August,
23d AUGUST, 1798.

Resolved, that any Member of the Society may have the privilege of introducing, as a visitor, any Gentleman who is not usually resident in Calcutta.

11th OCTOBER, 1798.

On a question, proposed at a meeting held on the 27th of September, "Whether absent Members, resident in Calcutta, shall be allowed to vote by proxy on the election of Vice Presidents and Committee of Papers." The Society determined in the negative.

10th JANUARY, 1799.

Resolved.

1st. That it will be proper to publish, with each volume of the Researches, a list of such Oriental subjects as may be considered in the light of Desiderata; to be prepared, by the Committee, from lists, submitted to the Society, by the Members or others.

2d. That, as a testimonial to the merit of the best Papers, communicated to the Society, on the subjects proposed as Desiderata, the author be presented with the volume of Researches, wherein such Paper is contained, accompanied with a complimentary letter, from the Secretary, in the name of the Society.

3d. That the rules of the Society, not already published, be inserted in an Appendix to the next volume.

4th. That four additional Members of the Committee of Papers be elected; and that the Committee do hereafter consist of thirteen Members, including the President, Vice Presidents, and Secretary; of whom, any Member, not less than five, may be competent to form a Committee.
FEBRUARY, 7th, 1799.

The Committee of Papers were authorized by a resolution of the Society to defray any small contingent expences on account of the Society, which they might deem indispensable.

JULY 4th, 1799.

Resolved,

That, in case, at any future meeting of the Society, the President and both Vice Presidents should be absent, a quarter of an hour after the fixed time of meeting; the senior Member of the Society present, shall take the chair for the evening.

The meetings of the Society are now held on the first Thursday of every month, at eight o'clock from the autumnal to the vernal equinox, and at nine during the other six months of the year.
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OF THE

ASIATICK SOCIETY,

1799.

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