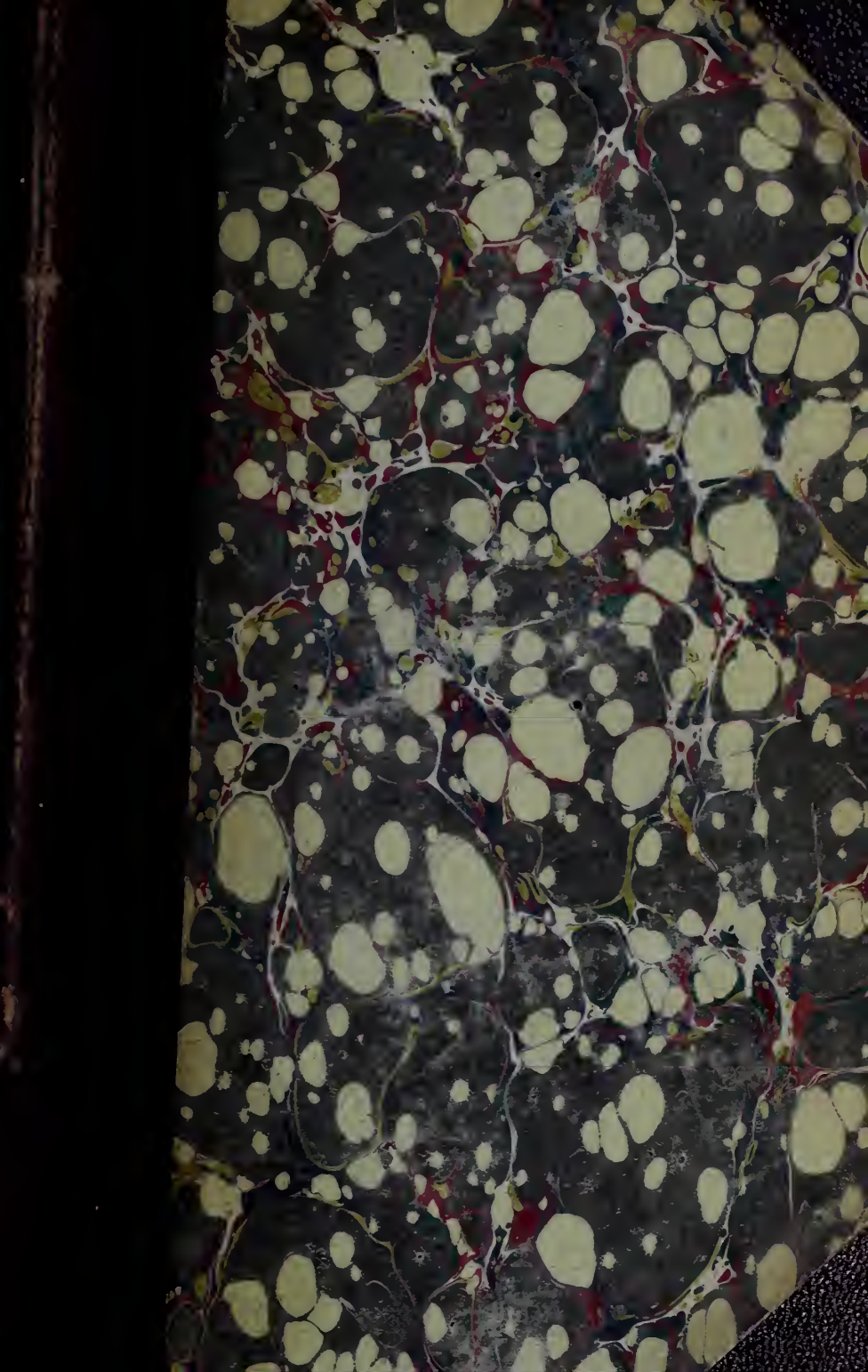


THE

JOURNAL

OF

THE ASIATIC SOCIETY

OF

BENGAL.

VOL. III.

THE

JOURNAL

OF

THE ASIATIC SOCIETY

OF

BENGAL.

EDITED BY

JAMES PRINSEP, F. R. S.

SECRETARY OF THE AS. SOC., AND HON. MEM. OF THE AS. SOC. OF PARIS.

VOL. III.

JANUARY TO DECEMBER,

1834.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of *Asia*, will commit their observations to writing, and send them to the Asiatic Society at Calcutta; it will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease."

SIR WM. JONES.

Calcutta:

PRINTED AT THE BAPTIST MISSION PRESS, CIRCULAR ROAD.

SOLD BY MESSRS. THACKER AND CO., ST. ANDREW'S LIBRARY.

1834.

JOURNAL

OF

THE ASIATIC SOCIETY.

No. 29.—*May*, 1834.

I.—*Translation of an Inscription in the Palí and Burma Languages on a stone slab from Ramávati, (Ramree Island,) in Arracan, presented to the Asiatic Society by H. Walter, Esq. C. S. as explained by* Ratna Paula.

The first line contains the name of the temple, the erection of which is commemorated, in the Burma character. (See Plate XV.)

KALIÁNÍ SINDOGI (the prosperous temple).

[Then follows in the Palí character and dialect of the Sanscrit the following aslôka.]

Invocation to Buddha.

Paramánanta-gyanassa varachákinda rájino,—gunáchintéya punnassa chirang dibbatú sásanam.

To the divine authority of infinite wisdom, of supreme majesty, and incomprehensible virtue, be glory for evermore.

[This is followed by an interpretation in Burmese, also written in the Palí character: after which come some more aslôkas, and a prose account of the purport of the record, which is then detailed at length in the common Burma language, forming the main portion of the inscription.]

Bikhú sanghéna ajjena séta náginda náména—rattha rájínda rajéna migasíra punnamáyam,

Chhidra-champa-ráma-nétan sampaté jina chakkéta—Théra vansa padípaká pitakékovida théra

VIMALA'VANSA DHAJA maharája gúrú pámakhá Mahinda Pamukhaviya sállékhá vuttino pancha,

Patitthá pésum sásanam,—tisuna nésang ágantva imá símácha Kalianí samatá tehi thérêhi chétiya pabaté tammé, tésu tésucha gámésu tathá kathápi símayú vansánu rakhaka tesáng.

Bahavo kula, putáto pathatá anusásaní—samudda tálá télangvá santá rakhantu sásanam.

Samá devácha rájáno dibantu dhamma vádino, chandová punna másiyam páhíntu ásanyáka.

In concert with his assembly of priests the illustrious king of kings, Raja SETA NAGINDA*, in the full moon of the month *Mrigasiras* (Feb.) in the year 2329† of the sacred or Jina era, having nominated the venerable priest, learned in the three volumes, VIMALA VANSA DHAJA, of illustrious family, chief Guru, and saint, after the manner of the holy Mahinda‡, and five eminent divines, established the Bauddha religion throughout the country: three of these having come, founded the *kaliani* temple: as many villages as there were, so many *chaityas* did these guardians of mankind erect on the joyful hills.

May the dignified of men, stand fast in the holy precepts, unruffled like an ocean of oil, and with saints, rajas, and good *devas*, spreading illumination as the full moon, in multitudes attain freedom §.

Burmese text.

Four months after attainment of final emancipation by BUDDH, and after the dispersion and extermination of those who conformed not to the dictates of his shastras were complete, 500 *Arahanta*‖ entered into a general conference on the remarkable sayings, maxims, and doings of BUDDH. From this time to the third general conference DASAKA SONAKA SIGGAVA, MOGGALIPUTTATISSATHER, and their successors, preserved the shastras in purity. In the third general conference, and in the 218th year of the annihilation of BUDDHA, when his doctrines and dogmas were established and become the rule and standard amongst his votaries, a certain minister, MOGGALIPUTTATISSATHER by name, in union with the votaries, companions, and guardians of the Arahant, employed appropriate instruments to circulate Buddhism amongst mankind. It was on this occasion first established in Ceylon, where it has been ever since maintained and preserved by MAHINDA SONATHER, ARITHA, TISSAATTA KALASUMANA, DIGHASUMANA, and by their respective successors to this day. In the country of *Suvannabhummi* (in Burmah called *Sathum*) it was first introduced in the 236th year of BUDDH annihilation by SONATHER and UTTARATHER, and has been preserved with purity

* Lord of the *white elephant*, a translation of the Burmese Rájá's name *Simpyú myaskhín menturágí*. (See the same name correctly written in page 212).—ED.

† In Pálí, as in Sanscrit, the date is expressed in words: *chhidra*, *champa*, *ráma*, *and netra*, (*hole*, *a flower* of two kinds, *Ram*, and *eye*,) signifying respectively 9, 2, 3, and 2: (see page 3 of the present volume,) and forming invertedly the year 2329 of the Gautama era, which corresponds with A. D. 1785-6.—ED.

‡ A Buddha saint, son of DHARMA ASOKA.

§ The Pálí text was made out with the help of Hindu pandits; it may not be quite correctly rendered, though most of the words are readily convertible into Sanscrit.—ED.

‖ By Arhant is meant those who have achieved an entire conquest over their evil passions, without a possibility of these passions ever obtaining the predominance.

ever since by his successors. In the 1600th year, when the *Arahanta* became paramount in the country of *Pukkam*, and in the kingdom of *Arimadduna*, the sovereign thereof, ANORATHACHO, in the greatness of his regard and esteem for the shastra, invited the learned from the country of *Sathum*, and planted it in his own dominions, which was done through the instrumentality of SONATHERA and UTTARATHER, and their disciples and survivors. Those who planted the shastras in *Pukkam* in union with the transcendently wise, as also with UTTARAJIVATHER (the guide of the king of *Pukam* country), the disciple of ARYAVANSAMATHER, who was the disciple of MAHÁKÁLATHER (of *Dassita*), in the year 1714, with the view of performing the púja of BUDDH, UTHARAJIVAMATHER and the rest went to and united with the followers and successors of MAHINDATHER and other great personages in Ceylon, and there engaged in religious exercises, and held discussions on the shastras; he felt great pleasure in finding the shastras pure and unalloyed, went to the temple in a body with them, and engaged in holy exercises. His disciple CHHAPADASÁMANE was on this occasion ordained a minister, and accordingly began to study the shastras with intensity in Ceylon, and in due course was promoted in ministerial rank, and installed one of the paramount ministers. In the year 1724, and in the reign of NARAPATICHESU, he uniting with SIVALITHERA of *Temalitte* village, TAMALINDATHER of *Kamboja*, ANANDATHER of *Kingchipura*, RAHULATHER of *Ceylon*, all unusually versant in the shastras, which they had wholly committed to memory, they came to *Pukum* country, where since the introduction of the shastras, as above stated, to the year 2314, the shastras were maintained and preserved by MAHINDATHER, SONATHER, and UTTARATHER, and their survivors and successors. After the death of his spiritual guide, VICHITTA LANKARA SAMME began to study the volumes called *Nayattika*, *Gandhara*, and *Abhidhamapitakat* (metaphysics) under the guidance of DHAMMAVILAMAHARAJAGURU. It happened that in the Burmese year 1132, and in the reign of CHHANGPRURHANG, he entered a society called *Suddarma*, and standing before the highest minister, addressed him thus: "I am your follower, and in order to have myself confirmed in the career in which I have started, I would choose you as my chief spiritual guide," and turning himself to MAHA SRISADDHAPPAVARACHHARATO and BUDDHARAKKHITA MAHASAMICHARATO (who was the superior minister of the temple of the *Pukam* country), he besought them to become his secondary guides.

It happened in the 100th year, that in the country of *Vesali*, the ministers who had come there from *Vajji*, made ten several additions to the shastras, and which were in full prevalence, thus endangering the orthodoxy of the shastras.

In the reign of MAHAMANYGOLARHVE BHUNGÁTHOP KRIDAYAKÁ MANGTARA, in the year 2323, certain unholy priests violated the laws of the holy BUDDH by inventing in the Palí language ten heterodox doctrines of their own, and substituting them in the stead of the dictates of BUDDH. It was amongst other things directed, that a piece of yellow cloth of four cubits long and one span in breadth, tied around the breast, should form the only raiment of priests—a doctrine to which they gave all the force of their own example. These inconsistencies made the monarch anxious to exhibit and elucidate to all his subjects, both foreigners and aborigines, the laity and the priesthood, the true shastras with commentaries: he therefore convened a general meeting, where those versed in shastrical lore, by long discussion and close scrutiny, came to the conclusion that the use of the yellow cloth in the manner stated was a violation of the shastras, and that priests should roll part of their cloth, and pass it under their arms; when it was also enjoined that the uninitiated priests should study *Sekhiyavatha*, (a volume which regulates dress and ceremonies,) and correct by its dictates their system of mendicancy, habiliments, and general demeanour. Many holy volumes, teeming with sapient comments, were brought to demonstrate the inconsistency of the practices prevalent, which could not be gainsaid or counteracted by the advocates of the new system, who formed a class living by themselves in the village of *Dum*.

Another general conference was held, in which presided MAHAYASA. There was a class of priests called *Chhabbaggi*, who used to practise ten several kinds of inconsistencies, when in the year 2326, it was determined and ascertained that the practice was founded on tradition, and not in the shastras. CHHANGPRU MRAHSAKHANG MANG TARAH KRI, the king of *Amarapura*, to whom were subject several tributary rajas, being displeased at the perversion, he by the power he was invested with by the institutions of Heaven, as well as by those of the laws of his own kingdom, suppressed unholiness, and amongst the rest destroyed the evil practices alluded to, and what was impure he filtered into refinement, so that the conduct and holy exercises of the priests were brought to concord and harmony, and those who followed wrong dogmas, or their own whims, were brought within the pale of orthodoxy.

In fine like SRIDHAMMASOKA, king of the world, he directed the circulation and establishment of the shastras in all accessible countries. Having heard that the shastras were made light of in a country called *Mahavisa*, he took possession of it, and brought and charmed away thence the statue of MAHAMUNI, and deposited it in a temple decorated with gems.

In Brother CHANOPRURHANO's reign, VICHITTA LANKARA being ex-

traordinarily versed in shastrical learning, the sovereign invested him with the joint office of *Vimala vansa-dhaja-maharaja guru*, and the presidency of the five several religious denominations; and they are as follow: *Punyavansaparama maharaja Gurucharato, Munindasridhaja maharaja Gurucharato, Chandamedhabhidhara maharaja Gurucharato, Paramasridhaja maharaja Gurucharato.*

After a consultation between the king and the priests of the country, it was determined upon, that some should be employed in extending and circulating the shastras beyond the limits to which they were confined. To this end those who had the shastras by heart started in the year Sakkaraj 1148 (A. D. 1786), with a view to plant and introduce it in *Rammavati*, in the island of *Yanbya Kvyan*, accompanied by a numerous retinue and attendants to answer every purpose. But before the conveyers of the holy word arrived at the destined place, they were escorted with honor thither by (the governor) NARASAMANKVYO, the general CHICHKAYRAY KHONGSIHA KVYO CHVA, &c. CHIKSIHANAKHANGNAT MHANG TAKNGORALHAKYOTAN, and the chief secretary CHARE KRIVERASUNGORASU MIUNG, and other chiefs of the country, who introduced the body composing the mission into the country. So great was the effect produced by their arrival, that from the 5th day of *Tabodoa*, (February,) to the end of the month, the very flower of the country were ordained priests of different degrees in the great temple called *Mahavihara*.

In the full-moon of *Tabongla*, (March,)a temple called *Kalyani simtokri*, was duly consecrated; in short, the various parts and villages of the island abounded with temples and pagodas, which were on this occasion built and consecrated. They also fixed the holy shastras in *Dvárávati* and *Meghávati**, and brought into operation the holy institutions, so that the very government and all its members, with the subjects of the island, heard with attention the three several classes of holy science, read, expounded, and proclaimed, in which they were eventually established. Thus holiness was attained, ministers of different ranks and degrees commenced the study of the shastras, so that the very island shone with yellow robes, characteristic of the prayers of holiness. During this state of things, it was earnestly prayed by all the zealous, that the unholy should separate and divide themselves from the righteous within 5000 years, and that the excellent of the land with their votaries may shine and prosper, in order that they may at last obtain that most transcendant of all bliss, *Nirbhan*, (final emancipation.)

* *Sandoway* and *Cheduba*, according to Mr. WALTER'S free translation of the same inscription, which has reached us too late to be otherwise available than for general comparison with Ratna Paula's version.—ED.

II.—*Translation of an Inscription in the Pálí character and Burmese Language, on a stone at Buddh Gya, in Behar.* Plate XVI.

When the Burmese ambassador MENGY MAHA CHESU and his suite were on their way to the Upper Provinces, to visit the Governor General; they took the opportunity of paying their devotions at the celebrated Buddhist temple near Gya. There, as usual making notes of every occurrence, they took copies of an ancient inscription in the Pálí character, discovered by them, in a half-buried situation near the *Maha Bodhi gách* or sacred pipal tree, on the terrace of the temple. A copy of their manuscript having come into RATNA PAULA's hands, he has obliged me by lithographing the text, as a sequel to the more lengthy inscription from Ramree in the present number.

It will be remarked that there is a near coincidence in the names of the kings of Ava, alluded to in the two inscriptions; although an interval of more than 500 years separates the two in date: this can only be cleared up by a better knowledge of the history of the country, than we now possess. In the Burmese chronological table, published in Crawfurd's Embassy, SATO-MANG-BYA (probably the same as *Sado-meng*) only founded Angwa or Ava in the Sakkaraj year 726. In 667-8, TA-CHI-SHANG-SI-HA-SU reigned in *Panya:* his grand-son founded and reigned in *Chit-gaing*.

At page 111, Lieut. BURT refers to an unintelligible inscription at Gya, mentioned by Mr. HARINGTON; but that contained only one line, and was in a different locality. The present inscription seems therefore to have escaped attention up to the present moment: it is now recorded as furnishing an authentic note of the construction of the *Buddha Gya* monument in the year 1305 A. D.; for it may be presumed that the previous Chaityas and Buddhist structures had been long before levelled with the ground, and the inscription states, that previous missions to reconstruct the edifice had been unsuccessful. As proving that this spot is held in peculiar veneration by the Burmese, it may be remembered that in 1823, a deputation of Buddha priests was sent from Amarapura, by the Burman emperor, to perform the obsequies of his predecessor, recently deceased, at the shrine of Buddha Gya.

Translation.

"This is one of the 84,000 shrines erected by SRI DHARM ASOKA, ruler of the world (*Jambodwip*), at the end of the 218th year of Buddha annihilation, (B. C. 326,) upon the holy spot in which BHAOAVÁN (Buddha) tasted milk and honey *(madhupayasa:)* In lapse of time, having fallen into disrepair, it was rebuilt by a priest named NAIK-MAHANTA. Again, being ruined, it was restored by Raja SADO-MANO. After a long interval it was once more demolished, when Raja SEMPYU-

SAKHEN-TARA-MENGI appointed his *gúrú* SRI-DHAMMA RAJA-GUNA to superintend the building. He proceeded to the spot with his disciple, SRI KÁSYAPA, but they were unable to complete it, although aided in every way by the Raja. Afterwards VARADASI-NAIK-THERA petitioned the Raja to undertake it, to which he readily assented, commissioning prince PYUTASING to the work, who again deputed the younger PYUSA-KHENG, and his minister RATHA, to cross over and repair the sacred building. It was thus constructed a fourth time, and finished on Friday the 10th day of *Pyadola*, in the Sakkaraj year 667 (A. D. 1305). On Sunday the 8th of *Tachhaon-mungla*, 668 (A. D. 1306), it was consecrated with splendid ceremonies and offerings of food, perfumes, banners, and lamps, and púja of the famous ornamented tree called *calpa-vriksha :* and the poor (two ?) were treated with charity, as the Raja's own children ? Thus was completed this meritorious act, which will produce eternal reward and virtuous fruits. May the founders endure in fame, enjoy the tranquillity of *Nirbhan*, and become *Arahanta* on the advent of ARYA MAITRI (the future Buddha)."

III.—*Classification of the Néwárs, or Aborigines of Népál Proper, preceded by the most authoritative Legend relative to the Origin and Early History of the Race.*

The Swoyambhú Púrána relates in substance as follows : That formerly the valley of Népál was of circular form, and full of very deep water, and that the mountains confining it were clothed with the densest forests, giving shelter to numberless birds and beasts. Countless water-fowl rejoiced in the waters. The name of the lake was Nâga Vâsa ; it was beautiful as the Lake of Indra ; south of the Hemáchal, the residence of KARKÓTAKA, prince of the Nâgas ; seven cos long, and as many broad. In the lake were many sorts of water-plants ; but not the lotos. After a time, VIPASYI BUDDHA arrived, with very many disciples and Bhikshús, from Vindúmati Nagar, in Madhya Désa, at the Lake of Nâga Vâsa, in the course of his customary religious peregrinations. VIPASYI, having thrice circumambulated the lake, seated himself in the N. W. (Váyúkona) side of it, and, having repeated several mantras over the root of a lotos, he threw it into the water, exclaiming, " What time this root shall produce a flower, then, from out of the flower, Swoyambhu, the Lord of Aknishtha Bhavana, shall be revealed in the form of flame ; and then shall the lake become a cultivated and populous country." Having repeated these words, VIPASYI departed. Long after the date of this prophecy, it was fulfilled according to the letter.

After VIPASYI BUDDHA, came SIKHI BUDDHA to Nâga Vâsa with a great company of respectful followers, composed of rajas and persons of the four

castes (chatúr varana). SIKHI, so soon as he beheld JYOTI-RUP-SWOYAMBHU, offered to him many laudatory forms of prayer: then rising, he thrice walked round Nága Vása, and, having done so, thus addressed his disciples: "This place shall hereafter, by the blessing of SWOYAMBHU, become a delightful abode to those who shall resort to it from all quarters to dwell in it, and a sweet place of sojourn for the pilgrim and passenger: my apotheosis is now near at hand, do you all take your leave of me and depart to your own country." So saying SIKHI threw himself into the waters of Nâga Vâsa, grasping in his hands the stalk of the lotos, and his soul was absorbed into the essence of SWOYAMBHU. Many of his disciples, following their master, threw themselves in the lake, and were absorbed into SWOYAMBHU, (i. e. the self-existent;) the rest returned home. VISWABHU was the third Buddha who visited Nâga Vâsa. VISWABHU was born in Anúpama-puri-nagar, of Madhya désa, (in the Trita yuga;) his life was devoted to benefitting his fellow-creatures. His visit to Népál was long after that of SIKHI, and, like SIKHI, he brought with him a great many disciples and Bhikshas, Rajas and cultivators, natives of his own land. Having repeated the praises of SWOYAMBHU-JYOTI-RUPA he observed. "In this lake Prajnasurúpa-Guhyéswari will be produced. A Bodhisatwa will, in time, make her manifest out of the waters: and this place, through the blessing of SWOYAMBHU, will become replete with villages, towns, and tirthas, and inhabitants of various and diverse tribes." Having thus prophesied he thrice circumambulated the lake and returned to his native country. The Bodhisatwa above alluded to is MANJU SRI, whose native place is very far off, towards the north, and is called Pancha Sirsha Parvata, [which is situated in Maha China Dés*.] One day in the Trita yuga, and immediately after the coming of VISWABHU Buddha to Nâga Vâsa, MANJU SRI, meditating upon what was passing in the world, discovered by means of his divine science that SWOYAMBHU-JYOTI-RUPA, that is, the self-existent, in the form of flame, was revealed out of a lotos in the Lake of Nâga Vâsa. Again, he reflected within himself: "Let me behold that sacred spot, and my name will long be celebrated in the world; and on the instant, collecting together his disciples, comprising a multitude of the peasantry of the land, and a Raja named DHARMAKAR, he assumed the form of VISWAKARMA, and with his two Dévis (wives,) and the persons above-mentioned, set out upon the long journey from Sirsha Parvata to Nâga Vâsa. There having arrived, and having made púja to the self-existent, he began to circumambulate the lake, beseeching all the while the aid of SWOYAMBHU in prayer. In the second circuit, when he had reached the central barrier mountain on the south, he

* The bracketed portions are from the commentators.

became satisfied that that was the best place whereat to draw off the waters of the lake. Immediately he struck the mountain with his scimitar, when the sundered rock gave passage to the waters, and the bottom of the lake became dry. He then descended from the mountain, and began to walk about the valley in all directions. As he approached Guhyéswari*, he beheld the water bubbling up violently from the spot, and betook himself with pious zeal to the task of stopping it. No sooner had he commenced than the ebullition of the water became less violent, when, leaving bare only the flower of the lotos, the root of which was the abode of Guhyéswari, he erected a protecting structure of stone and brick over the recumbent stalk, and called the structure, which rose into a considerable elevation as it neared the flower of the lotos, *Satya Giri.* This work completed, MANJU SRI began to look about him in search of a fit place of residence, and at length constructed for that purpose a small hill, to which he gave the name of MANJU SRI Parbata, (the western half of the little hill of Sambhú Nath,) and called the desiccated valley, *Népálá—Né* signifying the sender (to paradise), who is SWOYAMBHU; and *pála,* cherished, implying that the protecting genius of the valley was SWOYAMBHU or ADHI BUDDHA. Thus the valley got the name of Népálá: and, since very many persons had came from Mount Sirsha [or China] with MANJU SRI, for the residence of DHARMAKAR Raja and his suite, MANJU constructed a large place of abode, half way between Mount Swoyambhu and Guhyéswari, and named it after himself, *Manja Pattana,* and established therein DHARMAKAR [of Maha China], as Raja, subjecting the whole of the inferior sort of people who came from Sirsha Parbata to DHARMAKAR'S rule, and providing abodes for them in the city of Manja Pattana.

Thus was Népál peopled: the first inhabitants of which came all from Mount Sirsha [which is in Maha China], and thus the valley got the name of Népálá, and its inhabitants that of Népálí, [whose primitive language was Chinese.] [This language in course of time came to be much altered by the immigration of people from Madhya désa, and by the necessary progress of corruption and change in a new country,

* The site of the temple is near the centre of the valley, on the skirts of the lovely grove of Pasupati; and above 2½ or 3 miles east from mount Sambhu. The fable says, that the root of the lotos of Guhyéswarí was at the former place, and the flower at the latter; the recumbent stalk being extended throughout the interval between them. SWOYAMBHU or ADHI BUDDHA is supposed to reside in the flower, in the form of flame; PRAJANA PARAMITA or GUHYESWARI, in or at the root, in the form of water.

till a new language arose in Népál by the natural course of things. The primitive inhabitants of Népál were all of one caste, or had no caste. But their descendants, in the course of time, became divided into many castes, according to the trades and professions which they followed; and of these, such as abandoned the world and shaved their heads, became Bhikshu, Sramana, Chailaka, and Arhana, and took up their abode in forests or in monasteries. The latter four orders are all ascetical; and in strictness absolutely excluded from all worldly commerce. But should any of them, still retaining the custom of tonsure, become worldly men, such are called Srávaka, &c. to a great extent of diverse names]. MANJU SRI, having by such deeds as these acquired the highest celebrity in Népál, ostensibly, and for the instruction of the people, relinquished his mortal form, and became *nirván*; but, in truth, departed for Mount Sirsha with his two Dévis, and in due course arrived at Pancha Sirsha Parvata. Some time after the disappearance of MANJU SRI [in the Trita yúg] KARKUT SAND BUDDHA came to Népál, with some Bhikshukas, DHARMAPALA Raja, and a multitude of the common people, from Kshêmâvati nagar, of Madhya désa. The beauty of the country delighted him, and he remarked that in such a land the cultivator must be sure to reap as he sowed. He paid his devotions to SWOYAMBHU, and then launched out in praise of the merits of MANJU SRI the Nipálese patriarch. Afterwards, he performed púja to Guhyéswari, and then ascended Sankhocha mountain (Siva Púra): the prospect of the valley from that mount filled him with fresh delight, and he again celebrated the excellence of the country. GUNADHVAJA, a Brahman, and ABHAYANDÁDA, a Kshetriya, and others of the four castes (chatúr varana), respectful followers of KURKUT SAND, here solicited at his hands the favour of being made Bhikshukas, in order that they might remain in this happy land, and by the worship of SWOYAMBHU attain to high merit and honour. KURKUT cheerfully complied, and agreed to make a great many of the company Bhikshukas; and since the mountain top afforded no water for that ceremony, he by his divine power caused a spring to issue from the rock, and with its waters gave to his followers the requisite Abhishêka or baptism. He called the river that originated with this spring Vángmati‡; and then related to his followers both the past and future history of the valley watered by the Vángmati. Then, having left behind him at Népál, Raja DHARMAPÁL and some Bhikshus and common folks, who had come with him, and desired to stay, KURKUT SAND departed with the rest of them to his native city of Kshemávati. These companions of KURKUT SAND, or KRAKUCCHAND, were the first natives of the plains of India (Madhya-désa) who remained in Népál. Many of them, addicting themselves to the

business of the world, became householders and the founders of several towns and villages in Népál; whilst others, who adopted the ascetical profession, dwelt in the forests and Viháras. When these Madhya-désiyas had became numerous in Népál, they and their descendants were confounded with the former or northern colonists under the common appellation of Népáli and Néwári; being only separated and contradistinguished by the several trades and professions which they hereditarily practised. Thus, in the early ages. Népál had four classes of secular people, as Brahman, Kshatriya, Vaisya, and Sudra, and four ascetical classes, namely, Bhikshu, Sramana, Chailaka, and Arhanta, dwelling in forests and monasteries; and all were *Buddh-márgi.*

Account of Dharmákar Raja and Dharmapál Raja.

Dharmakar, the before noted Chinese prince of Népál, being disgusted with the world, abandoned his sovereign power, and placed *Dharmapál*, the Raja of Gour-dés, already mentioned, upon his throne. *Dharmapál* governed his subjects with perfect justice and clemency, and made púja at the Chaitya erected by Dharmakar, and regarded with equal favour his subjects that came from Mount Sirsha [or Maha China], and those who emigrated from Madhya-dés.

Account of Prachanda Deva.—Prachanda Deva, a Raja of Gour-dés, (which is adjacent to Madhya-dés,) and of the Kshetriya tribe, was the wise man of his age and country. At length, being inspired with the ambition of becoming *nirvan*, he abandoned his princely sway; and taking with him a few sages, he began to wander over various countries, visiting all the shrines and pilgrimages, and in the course of his peregrinations arrived at Népál. He was delighted with the beauty of the country, and having visited every *tirtha*, and *pith*, and *devata*, and having made puja to the *Tri Ratna*, or triad, he went to the temple of Swoyambhu, and there performed his devotions. He then ascended Manju sri Parvat, and offered his prayers to Manju Sri, and finished by becoming a disciple of Gunakar Bhiksau, a follower of Manju Sri. One day Prachanda Deva so delighted Gunakar with the display of his excellent qualities, that Gu'nakar made him a Bhikshuka, and the said Raja Prachanda after becoming a Bhikshu obtained the titular appellation of Santa sri. A great many Brahmans and others who accompanied Prachanda to Népál received the tonsure, and became Bhikshus at the same time with Prachanda, and took up their abode in the monasteries of Népál. Some others of those that came with Prachanda to Népál, preferring the pursuits of the world, continued to exercise them in Né-

‡ From *Vach*, speech.

pál, where they also remained and became Buddhists. A third portion of PRACHANDA's companions returned to Gour-dés. After a time, SANTA SRI represented to his Gúrú GU'NAKAR his desire to protect the sacred flame of SWOYAMBHU with a covering structure. GU'NAKAR was charmed with the proposition and proposer, and having purified him with 13 sprinklings of sacred water (*trayodas abhiséka*), gave him the title of Dikshita Santikar Vajra Achárya. [From these transactions is dated the arrival of the people of Gour-dés at Népál, and their becoming Buddhists.]

Account of Kanaka Muni.—Once on a time, from Súbhávati-nagar of Madhya-dés, KANAKA MUNI BUDDHA, with many disciples, some illustrious persons, and a countless multitude of common people, arrived at Népál, in the course of his religious peregrinations, and spent some months in the worship of SWOYAMBHU, and the Tri Ratna, and then departed with most of his attendants. A few remained at Népál, became Buddh-márgi and worshippers of SWOYAMBHU; [and these too, like all the preceding, soon lost their name and character as Madhya-désiyas, and were blended with the Népálí or Néwárí race.

Account of Káshyapa Buddha.—Once on a time, in Mrigadâba-vana, near Benares, KÁSHYAPA BUDDHA was born. He visited Népál in pilgrimage, and made his devotions to Sambhu-nath. [Most of the people who came with him staid in Népál, and soon became confounded with the aborigines.]

Account of Sákya Sinha Buddha.—Some time after KASHYAPA's visit, in the beginning of Kali yuga,] on the shores of Ganga Sâgara, in the sthan of KAPILA MUNI, and city of Kapila-vasta, and reign of SADHÓDANA Raja, of the Sâkya vansa, was born (as the son of that Raja) SARVARTHA SIDDHA, who afterwards became a Buddha with the name of SAKYA SINHA. SAKYA, with 1350 Bhikshukas, and the Raja of Benares, several counsellors of state, and a crowd of peasantry of that kingdom, set out on the pilgrimage to Népál. Having paid his devotions to the self-existent, in the form of flame, he went to the Chaitya on Púchhágra Hill, and repeated to his disciples the past history of Népál, as well as its whole future history, with many praises of MANJU SRI BODHI SATWA: he then observed, "In all the world are 24 *Piths*, and of all these that of Népál is the best." Having so said, he departed. His companions, who were of the Chatur varana, or four castes, [Brahman, Kshetriya, Vaisya, and Súdra,] and belonged to the four orders, [Bhikshu, and Sramana, and Chailaka, and Arhanta,] being much pleased with Népál-dés, continued to dwell in it; [and in course of time were blended with the aboriginal Népálís, and became divided into several castes, according to the avocations which they hereditarily pursued.]

Some time after the date of the above transaction, Raja GUNAKAMA DEVA, prince of Cathmandú, a principal city of Népál, became the disciple of the above-mentioned Sántikar Vajra Achárya. GU'N KÁM DEVA, with the aid derived from the divine merits of Sántikar, brought the Nág Raja KARKU'TAKA out of the lake or tank of Adhâr, and conveyed him to Sántipúr with much ceremony and many religious rites. The *cause* of this act was that for many previous years there had been a deficiency of rain, whereby the people had been grievously distressed with famine; and its *consequence* was, an ample supply of rain, and the return of the usual fertility of the earth and plenty of food.

Subsequently, SRI NARENDRA DEVA became Raja of Bhagat-pattan, (or Bhatgaon); he was the disciple of BANDUDATTA ACHÁRYA, and brought ARYAVALOKITESWARA (Padma Páni) from Pútalakáparvat (in Assam) to the city of Lalita pattan in Népál. The reason of inviting this divinity to Népál was a drought of 12 years' duration, and of the greatest severity. The measure was attended with like happy results, as in the case of conveying the NAG Raja with so much honour to Sántipúr.

[The classification will be given in an ensuing number.]

IV.—*Further Account of the Remains of an ancient Town, discovered at Behat, near Seháranpur. By* P. T. Cautley, *Art. Supt. Doab Canal.*

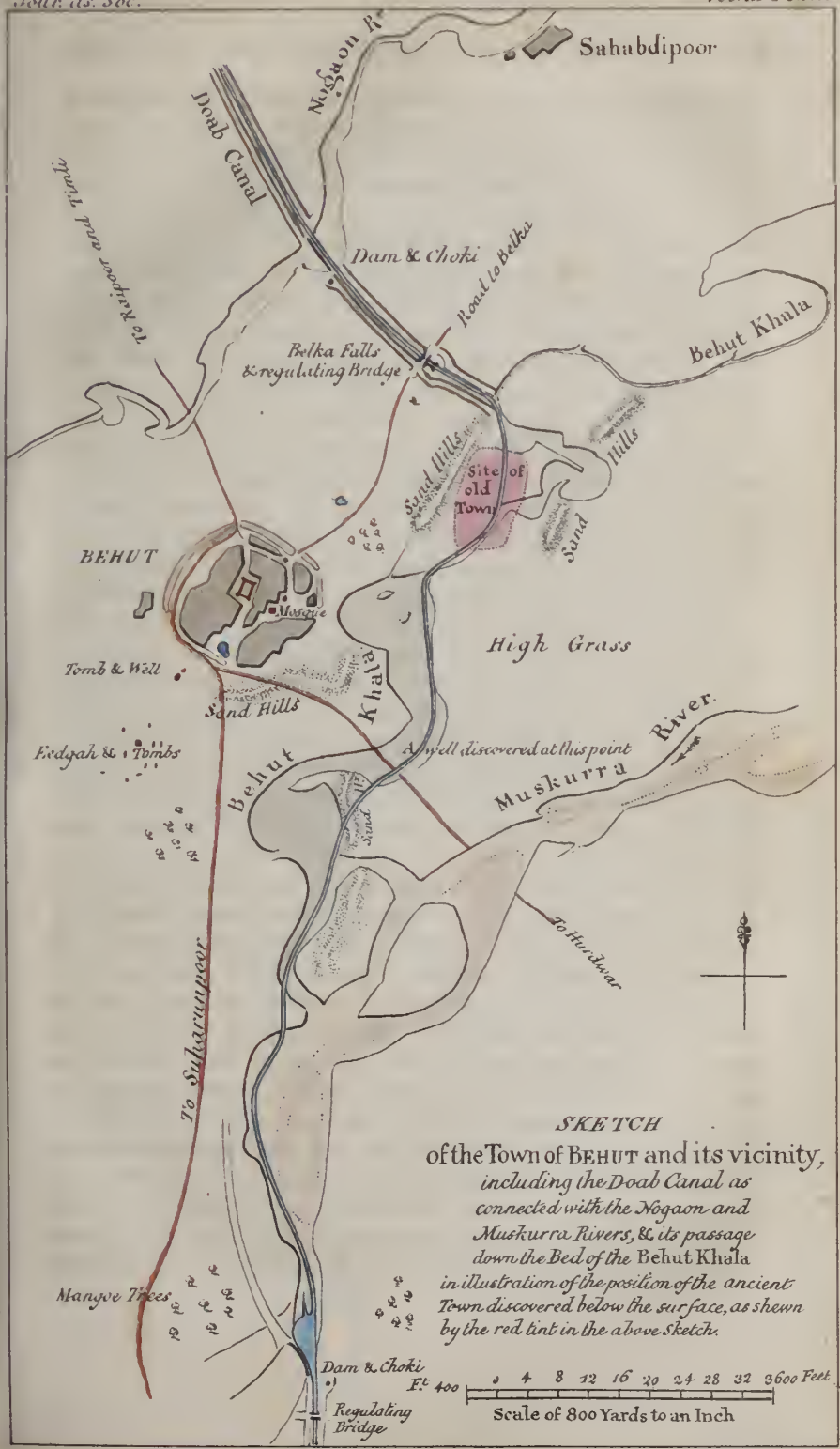
[In a letter to the Secretary, read at the Meeting of the 30th April.]

With more coins and other articles that have been found in our Herculaneum, I have now the pleasure of sending a sketch of the country in the neighbourhood of Behat, which will be more descriptive of the ancient town, with the size and extent of the mountain torrents in its vicinity, than any explanation that I could give in writing: the total absence moreover of any tradition of its having existed, and the little information to be gained from natives on subjects of this nature, unless coming under their immediate observation, places me in dependence solely on the few notes that I have by me, which I fear are hardly worthy of the notice of the Society.

Tradition, but even that of the vaguest description, carries us back to the reign of SHAH JEHAN, as well as to that of MUHAMMED SHAH and his successors at the dissolution of the empire. SHAH JEHAN built a palace or hunting seat at the foot of the lower range of hills on a branch of the Jumna river, about 14 miles north of Behat: this place which consists of a main quadrangle of 800 feet square, with numerous buildings and minor courts attached, is now in perfect ruin, the superstructure only remaining in a few places, and that entangled and held together by arms and roots of the Bur

(Ficus Indica) and other jungle trees; at Raipúr, Nyashahr, Fyzabad, and other places between Behat and this palace are remains of the same period in mosques, tombs, &c. and the forests in the neighbourhood contain marks of a more extended cultivation, and of a country more thickly inhabited than it is at present; it may be fairly presumed that all the Musulman buildings now in existence *here* are dependent on a period posterior to the middle of the 17th century. Behat itself contains a mosque and tomb near it, with only one brick house or enclosure, but a number of pukka wells, and is said to have been a large town at the period alluded to; but the ruins and tombs pointed out as the remains of this era are *south* of the present town, and in quite a different direction to the antiquities that have been now discovered.

To a person at all acquainted with the strange revolutions that take place on the surface, in the proximity of these mountain torrents provincially termed *rows*, the mere change of the river's course, or an extensive deposit of sand on a wide surface, thereby laying waste large tracts of cultivable soil, would not be at all surprising: such changes are in constant progress, and things of annual occurrence! The course of the Nogaon row, as shewn in the map, has been so altered within the last half century, agreeably to the information of a respectable zemíndar, or landholder who resides at Behat, that the features of the country are perfectly changed since his childhood: he mentions (a circumstance borne out by my excavations) that in his recollection, "all the country between the two rivers through which the present canal runs, and on which the Belka falls are now constructed, was a low clay soil (*dhaka*), with rice cultivation; that this tract now is raised five hat'hs by a deposit of sand, caused by one very severe rainy season, in which the present town of Behat was in jeopardy;" this exactly corresponds with the canal excavations, the superficial 5 to 7 feet of which was sand, reposing on a reddish sandy clay, the section at the point where the ancient town is buried shews the same deposit of 4½ feet with the same sub-stratum of clay! The Behat khala or ravine opening out into the Muskura river is said to have been much enlarged by the ancient canal, when great mischief was done to the neighbourhood; referring to the last attempt at making use of this line as a canal by the Rohilla Zabitha khan, who has the credit of having carried water to the town of Jelalabad and his fortified camp Gousgurh. I take the liberty of referring you to the strange tortuous outline of this ravine, of which the map gives a faithful representation, (Pl. xvii.) as near this ravine lies the old Town at a depth of 17 feet from the surface, with a super deposit of 12½ feet of a reddish sandy clay.



SKETCH
of the Town of BEHUT and its vicinity,
including the Doab Canal as connected with the Nogaon and Muskurra Rivers, & its passage down the Bed of the Behut Khala
in illustration of the position of the ancient Town discovered below the surface, as shewn by the red tint in the above Sketch.

P. T. Cautley del. J. B. T. sin lith.

The fall or difference in level between the bed of the Nogaon and that of the Muskura river, at the point where the khala joins it, was previous to the present canal works being constructed about 21 feet, on a line with all its tortuosities not exceeding three miles! Now it would be supposed that had the canal formerly passed over this line, without masonry or other works to protect it from erosion, the wear and tear of such a rapid would in a very short space of time have connected the Nogaon with the Muskura, and thrown all the waters of the former down the latter's channel. It is perfectly evident, that this did not take place, for such an event must, when once established, have remained; a point which almost ensures one of two surmises;—either that the ancient canal never was opened, or kept open for any length of time; or that works were constructed in this neighbourhood. These works might have been at the spot where these antiquities have been found: such was my idea on the discoveries being laid open, and such was the impression under which I visited the spot after it had been pointed out to me, and I must confess that the reasons were so strong in favor of this being the mere ruin of old canal works, that I was considerably biassed in favor of the supposition, that at this spot had been the descent or fall by which the difference of level had been accomplished. On examination however, this idea was completely annulled, for the distinct stratum of black soil, filled with bits of pot and bone so exactly corresponding with the sites of ancient villages now existing on the surface, and this stratum extending for a continuance, placed the matter in a far different light, completely laying aside the possibility of this either having been the remains of a canal work, or with reference to the coins, &c. the probability of its being a mere deposit caused by transportation. There is not a doubt on my mind of this being a town submerged, the reasons and causes of which may be ascribed not only to the proximity of rows, but to the effects of winds; in short the filling in of a hollow. But when this happened, or what were the features of the country's surface at the period previous to this taking place, may well remain an enigma; for looking around us at the present day, we find the position of towns and villages invariably fixed either on the highest spots or on the slopes of valleys! Now, was this town at the period of its existence high or even partially so, with reference to the surrounding country, to what date can we possibly look to its existence? And how picture to ourselves the face of the neighbouring country? There is no doubt however that this town is of great antiquity, and to those conversant in these matters, and I cannot refer myself to one more so than yourself, a

door may be opened, from the great number of coins that have been found, to fix the probable date, when this town was inhabited.

The level of the country does not exhibit any distinct basin or hollow; but, taking a line from the Nogaon river at the dam over the site to the Muskura, one continuous slope will be found, with indentations at each of the rivers; the proximity of the lines of sandhills and their directions might lead to speculations; but these are just as well avoided; for if, as we must allow, (from finding shingle and old beds of rivers many feet below the present surface,) the present surface has been considerably *raised*, we have with the agency of these mountain streams, and the soil acted on by winds, data sufficient to shew that the inhumation of a city, or whatever was at the spot in question, was nothing at all extraordinary.

It may be interesting, with reference to the constant change of surface in this region, to mention, that when engaged in constructing a bridge at the village of Gandewar, about two miles higher up the canal than the Nogaon row, the difficulty of obtaining water for the works was such, that I was induced to sink a shaft in the canal bed. The well was sunk 30 feet to water, the upper 20 feet was through the reddish sandy clay above-mentioned, below which was shingle or boulders exactly resembling those found now in the beds of all these rivers: through 10 feet of this shingle water was found. This nearly corresponds with the bed of shingle now laid bare south of the Belka Falls, and amongst which the coin, &c. have been found, and I have no doubt that it is all part of an extensive line formerly the bed of the escapes from the lower mountains. If this is true, it goes far to prove a circumstance that I before mentioned in a communication to the Society, that the enormous discharge of matter from the debouchements of these lower hills is, in the reduction of themselves, gradually giving a rise to the whole country skirting their bases! I may also mention, that near a village named Jytpúr, three miles south of the Kalowala Pass, (at which pass water is within 10 inches of the surface,) I sunk a well for the reasons aforesaid 60 feet deep through a succession of beds of shingle, and left off, finding no water! At a place six miles south of this again, water is within eight feet of the the surface. This phenomenon extends apparently on the whole line between the Jumna and Ganges, that is to say, water is near the surface at the foot of the hills, and shews itself again near the surface about 10 miles south, being in the intermediate distance at a great depth. In building the masonry dam on the Nogaon river, water was found at a depth of 29 feet from the bed of the row; the excavation through beds of sand and clay, but no shingle. The only mark of building which has

been as yet found on this site is the remains of a foundation, the greater parts of which had been cleared out and broken by the canal: the bricks were soft and friable. This foundation was sunk about four feet in the black soil, terminating on its surface; the great quantity of bricks however scattered in the canal bed proves distinctly that many more foundations had been cleared out, and it is possible that when I have time to sink wells in neighbouring points, so as to detect the boundaries of these ruins, I may bring to light matters of greater interest than those even now before us. The bricks discovered are of a large size, and generally speaking, badly burned, (similar to some that were found on a former occasion at Manukmow, near Sehárunpúr, where a quantity of old foundations were discovered, consisting entirely of the same sized bricks:) a number of them wedge-shaped $\frac{12}{1}\frac{\text{9 inches}}{\text{6 inches}}\frac{1}{1}$ as if intended for well building, and better burned than the square ones. Amongst the fragments of pots, were some which the natives recognised as resembling those now used in making indigo, long elliptical vessels! the fragments of pots, bones, teeth, and articles of this description are in abundance. In sinking three wells on the west of the canal near the spot, the same section of soil appeared, and the same articles were discovered on reaching the black stratum. I look forward with great interest to the time when I can have leisure to make further excavations in the neighbourhood, enabling me to form an idea of the extent of the discovery.

At a spot considerably south (marked A in the map) a large pukka well was also exposed in the canal channel. I had this cleared out and partly removed, supposing that there was a probability of making further discoveries. I send to the Society an article (either lead or pewter)* which was the only thing of metal found: a great quantity of *gharas* or water pots were taken out whole, as if they had fallen into the well and sunk; the bones also of two deer (barasinghas), the horns broken in pieces, but the jaw bones and other parts tolerably perfect: from the circumstance of finding so many *gharras* the natives seem to conclude that this was a town or village well, and not that in use for irrigation. If the ancient town extended to this point, it would be extensive indeed, but of this there does not appear to be any probability.

The presence of the deer's bones is easily accounted for, as a number of these, as well as other wild animals, are constantly lost in galloping over the jungles, and falling into deserted wells. The well in question was doubtless one of this description, for a long time after either the town or cultivation for which it was intended was deserted, and remained long open amongst the high grass and jungle which so rapidly obtain in this part of the country when the hand of man is absent: all

* This small disc or wheel does not bear any marks of antiquity. —Ed.

marks of this well were so completely obliterated, that the present canal was excavated over it without its being discovered. The bricks used appear to have been of the same description as the square ones above described.

Amongst the metal articles found in the site of the old town, are a great number of *selaís* or instruments in use in a Hindustani lady's toilet for applying surma to the eyes, made of *copper* apparently. To this circumstance my attention was drawn by a native sonar, who observed that *now* articles of this description were never made of that metal; the great quantity of rolls of metal and wire found would lead a person to suppose that the main exhumation at present consisted of a smith's shop! There are some other things, one bearing in some respects a resemblance to a small cannon (17), another to a button hook, &c. &c. The quantity of slag of iron smelting furnaces is a singular circumstance, for although iron ore is found in the mountains at no great distance, it is not the practice now to import it in that state into the plains.

The number of coins found, and in my possession, is 170, amongst which are two intruders that would, if they belonged to this town, very considerably reduce the antiquity of it; but from the circumstance of there only being two, and from their appearance (having no mark of that antiquity so eminently conspicuous in all the other coins found), I am much inclined to suspect that some of my myrmidons have been false, or that there are stray coins*; both of them are sent with this letter. My method of collection was by giving new coin for old, that is to say, new pice for all the old ones, and new rupees for all the old rupees discovered, and remuneration according to the value of other articles: this may have raised the cupidity of some speculator to introduce these two Musulman coins into my cabinet. All those upon which any mark is apparent, and all other articles worthy of transmission, will be sent to the Society's museum.

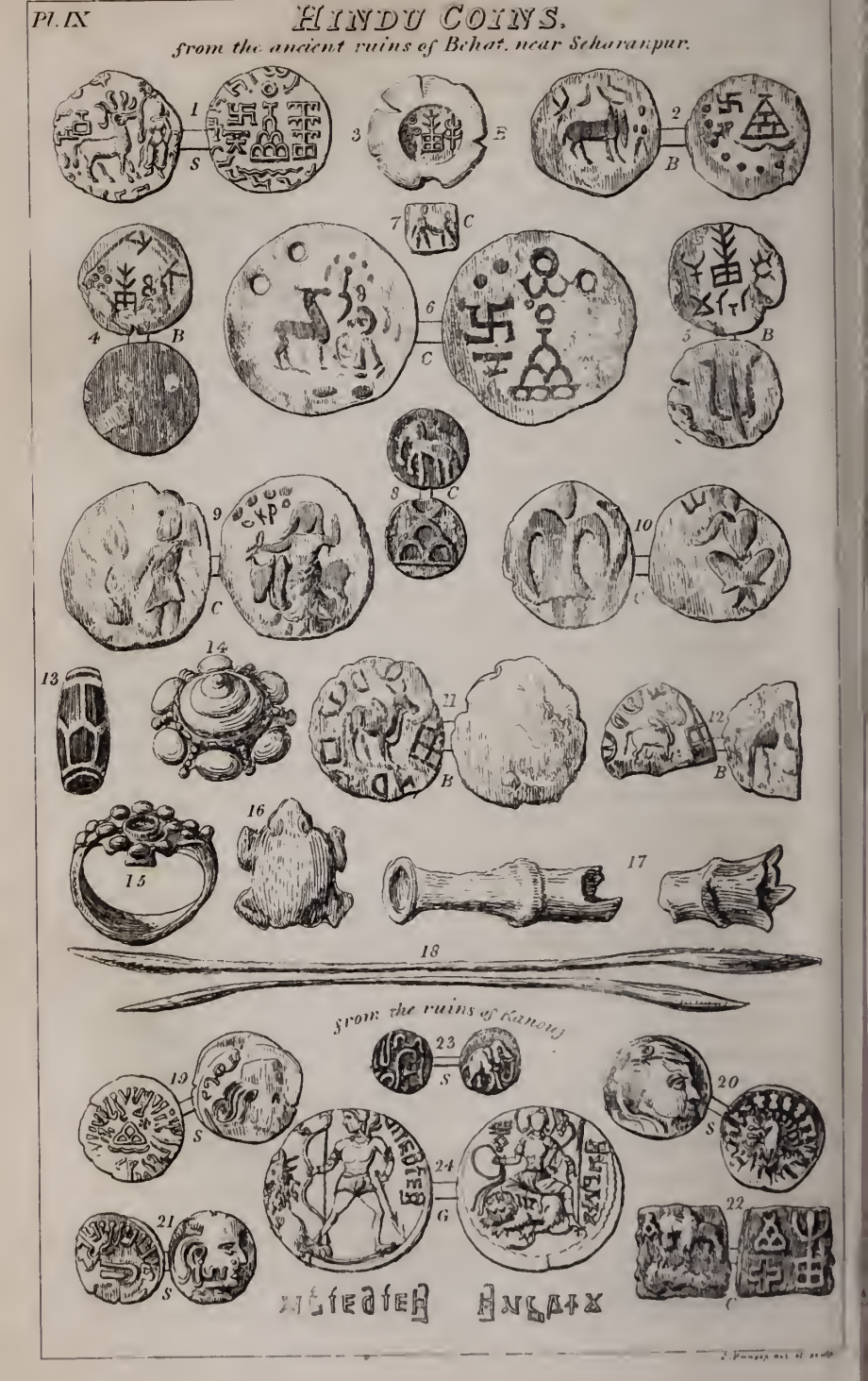
I will conclude with a remark, that the accompanying map will give a good idea of the Doab Canal works in the neighbourhood of Behat, shewing its connection with two of its greatest impediments, namely, the Nogaon and Muskura rivers, and the descent between the two at the Belka Falls. During the rains and floods, the regulating bridges being closed with gates, and the dams thrown open, no water whatever passes down the canal, and each river or torrent has its own flood kept to itself; the size of these rivers, and the quantity of water that they carry, is in high floods very great; at other seasons they are quite dry, and consist

* Our author need be under no alarm whatever from the presence of these two coins, which must have been purely accidental, and in no way connected with the antiquities of Behat; for on examination, one turns out to be a pice of Indore, the other of Lakhnao, both known by their respective symbols, and quite modern.—Ed.

Pl. IX

HINDU COINS.

from the ancient ruins of Behat, near Seharanpur.



of extensive beds of sand with scarcely any vegetation. The falls at Belka consists of two chambers thirty-five feet in total breadth, passing in two descents of brick masonry, a fall of 15 feet, a power for machinery that would in any country but this be duly appreciated, and have long ago led to the establishment of a town or city in its neighbourhood, which would have thrown into the shade the submerged city. These falls are worthy of the attention of speculators under the new charter, a point which although not directly coming under the views of the Society, may be well referred to, as bringing to notice the dormant claims that the Doab Canal has on those possessed of capital, combined with mechanical skill and energy.

V.—*Note on the Coins, found by Captain Cautley, at Behat. By* James Prinsep, *Sec., &c.*

The accompanying plate (xvii.) exhibits faithful representations of some of the coins presented by Captain Cautley to the Society. Those numbered 1 to 6 are all of the same character, and, as far as I am acquainted, entirely new to Hindú numismatology, although connected by a peculiar symbol with the fifth series of Col. Tod's plate* (fig. 19 of the present plate); also with the copper coins 68, 69, of Mr. Wilson's third plate† (fig. 22 of the present plate); and with fig. 19 of Mr. Masson's collection, in plate 9 of the last number of the Journal; all three series in other respects differing materially from one another.

Fig. 1. May be looked upon as the type of this new series. It is a silver coin of the size depicted in the engraving, and weighs 20 grains. The silver has been so acted upon by long continued burial, that on arrival in Calcutta, wafered on to the folds of a letter for security, the removal of the wafer stripped off a thin film of silver from its surface. The impression however is still perfect and in deep relief.

Obverse. On one side we perceive a female figure clothed, holding in her right hand a stalk, bearing on its summit a large open flower:—(this emblem will be seen below to be common to another class of Indian coins;) on her right stands an animal, of the precise character of which it is difficult to make any positive assertion:—it has a stout straight trunk, which might pass for that of a deer, or of a horse, but the head more resembles that of a bird, and it is surmounted with a radiated crest, which at first sight wears the appearance of horns. On the left of this nondescript animal is a symbol or monogram much resembling character 5 of the Allahabad inscription, No. 1, but square, instead of round, in the body. There are other characters round the margin but partially visible.

* Trans. Roy. As. Soc. vol. i. † As. Res. vol. xvii.

Reverse. The opposite side of this curious coin presents an assemblage of symbols, the purport of which it is difficult to divine. The principal figure in the centre seems to represent a temple, a pyramidal building, with three tiers of rounded *súras*, spires or domes, surmounted by a *kulsa* or pinnacle in the form of the letter T: the contour of this device resembles also the Hindú drawings of rocks and mountains, and it may be intended to pourtray some holy hill, connected with the mythology or with the locality of its place of coinage: beneath the pyramid is a waved line, which may also possibly depict the sea, and point to some fabulous mountain in the ocean, as *Lanka* or *Meru*. To the right is another curious emblem, which for want of more correct information, we may call a *tree of triple branch*, standing in a frame or on a kind of *chabútra*. To the left is the *swastika* emblem 卐, of four legs conjoined: and below it a figure very similar in form to ⚒ or Ⅎ or some other compounded Greek characters on the Bactrian coins. There is a legend around the margin consisting of the letters hitherto called *Pehlevi*, but which I think we shall soon find reason to denominate otherwise.

Fig. 2. A copper coin similar in every respect to fig. 1, but of inferior execution; in this the circles of the *chaitya* or temple are made square, and resemble common masonry.

Figs. 3, 4, 5; are smaller copper (or rather white bronze) coins, stamped only on one side, except No. 5, which has a faint impress of a *tirsul* on the reverse. The form of the tree is altered, and the frame below has, in some specimens, four compartments instead of two: the *swastika* is also exchanged for four circular rings.

Fig. 6. A copper coin weighing 163½ grains, in imperfect preservation. The only variation in this coin from the type-coin fig. 1, is that the pyramid contains two tiers instead of three. This circumstance, however, constitutes the link of connection with the other series of coins to which I have alluded.

All of them having the symbol ☙ in common.

Fig. 7. Is a small square copper piece, with an elephant on one side, the other effaced.

Fig. 8. Is a small copper coin procured by Lieut. A. CONOLLY, at Kanouj, upon which this mark ☙ forms the distinguishing emblem. A similar coin is in Major STACY's possession, obtained in Central India. I shall have to recur to the subject in describing figs. 19 and 22.

Figs. 9 and 10. I have introduced these two coins to shew, that what has been called the Indo-Scythic series occurs plentifully among the exhumated relics of Behat.

The first of these, the raja and bull coin, must henceforward be

entitled the *Kadphises* series, in compliance with the successful researches of Mr. Masson published in our last number; the *Kanerkos* series, also occurs as commonly among the coins transmitted by Capt. Cautley, and as we know that these two coins bear Greek inscriptions, and that their epoch cannot consequently be much posterior to the Bactrian dynasties, we may presume that all the descriptions of coins having the *chaitya* or ⸙ symbol, being proved to be contemporaneous with these, must belong to the first centuries of the Christian era, and consequently the destruction of the ancient city may be ascribed with tolerable certainty to the same early period. The circumstance of so much money being discovered in one place would seem to denote that the catastrophe which destroyed the place was sudden, but the destruction is as likely to have been effected by the ravages of war, as by any convulsion of nature; and, when once depopulated, the place might easily have been buried under the gradual deposit of silt washed down by the hill streams, as described by Capt. Cautley.

Figs. 11 and 12. These coins are connected with the above by the tree symbol, by their being stamped only on one side, and by their being of white bronze; but in them the animal is decidedly the brahmany bull, and the inscription is in a different character.

Figs. 13, 14, 15, 16, 17, and 18, are introduced to give an idea of the other curiosities from Behat.

The first is a black and white enameled bead; 14, an ornament of the headdress of some image; 15, a ring probably worn while performing certain religious ceremonies; 16, appears to be a weight moulded in the shape of a frog, as is the custom in Ava, and in many parts of India: it weighs 360 grains, (precisely two tolas,) or six Grecian *drachmæ*, and is not corroded. Fig. 17 is the metal handle of some vessel: it is broken in half. Fig. 18, are the *selaís* for applying *surma* to the eyes, spoken of by Capt. Cautley, as so numerous: in the present day they are generally made of zinc. Besides these articles, our flourishing little museum contains plain rings, arrow-heads, hooks, and rolls of lead, converted into semi-crystalline hydrated oxide by exposure to the moisture under ground*. Most of the copper coins likewise are in a very imperfect state, the pure metal not resisting corrosion nearly so well as bronze.

Hindú Coins from the ruins of Kanouj.

To confirm the assertion made above of the connection of several other series with the *Behat* coinage, I have introduced at the foot of the

* See note on a similar change produced in zinc plates, vol. ii. p. 437. The lead is partially converted into minium and partly into protoxide. In some rolls the interior is still metallic.

present plate, drawings of some most interesting coins, procured by Lieut. A. CONOLLY, of the 6th Light Cavalry, at Kanouj, and this moment received from that officer at Cawnpore.

Figs. 19 and 21. Silver coins, weighing 28 grains each ($\frac{1}{2}$ drachm), corresponding in every respect with Col. TOD's fifth series, in the head, on the obverse, and in the circular inscription on the reverse: in 19, also, we find the central symbol ☙ with five dots on the side, as in his coin. Col. TOD's observations on these rare coins are as follows:

"The fifth series is entirely novel and unexplored. All I can say of them is that they belong to a dynasty which ruled from *Avanti* or *Ujjayan* to the Indus, for in that whole tract I have found them. The first I obtained was from the ruins of ancient *Ujjayan*, twelve years ago, presented to me by Mr. WILLIAMS, resident at the Gykwar court, who first awakened my attention to their importance. He found them in Cutch, and in his company, I discovered others among the ruins in the Gulph. The character of the epigraphe I have met with on rocks in *Saurashtra*, in the haunts of the Suroi, the bounds of the conquests of MENANDER and APOLLODOTUS. I have little hesitation in assigning them to the *Balhara* sovereigns of RENANDOT'S Arabian travellers, the Bhalla Raes of *Anhulwára Patan*, who were supreme in those countries: "This Balhara is the most illustrious prince of the Indies, and all the other kings acknowledge his pre-eminence. He has, of these, pieces of silver called Tartarian drams. They are coined with the die of the prince, and have the year of his reign."—RENANDOT, page 15. "The Balhara dynasty had a distinct era, 375 years posterior to VICRAMADITYA."

The character of the circular legend in all these coins strongly resembles Sanscrit:—if the place of their discovery be a test of the extent of empire in which they circulated, they will belong to a powerful monarch indeed, for Mr. MASSON has found twenty at Beghram, (of the same symbol at least,) while they extend to Kanouj, Behat, and Benares on the east.

Fig. 20. A silver coin, weighing 34 grains; is evidently of the same series; but here the distinctive symbol is lost, and is replaced by a peacock with expanded tail: the letters are not decypherable.

Fig. 22. A square copper coin, also from Kanouj, is already known as No. 68 of WILSON's plate, (see As Res. vol. xvii.) which was dug up by Capt. VETCH on the Allahabad road. It bears on the *obverse* an elephant and some other animal prostrate; on the *reverse*, the ☙ symbol, the tree, and a cross, all of which prove its close alliance with the Behat coins. More of the general history of the whole series may yet be developed by future discovery.

Fig. 23. A silver coin, weighing 7.7 grains, resembles a fanam of South India, but its type shews that it may be a genuine connection of the coins it accompanies.

Fig. 24. A gold medal weighing 123 grains. *Obverse*,—a figure clothed in the Hindú dhotí, with armlets, holding a bow, as having just discharged an arrow through the head of a lion, or other monster, on the right; in his left he holds another arrow prepared; his right foot

rests on the tail of the lion. Inscription in ancient Nagari महाराज धिराज श्री *Maharajadhiraja Sri. Reverse*—either the same person or a female figure clad in similar costume, seated upon the vanquished lion, holding a large flower in the manner of a cornucopia in the left hand, (see also figs. 1, 4,) and in the right, a kind of noose; above which the lozenge symbol with four prongs (16 of plate xiv. vol. ii.) On the right in ancient Nagari, the words श्रीमद्व कचो *Sri madghavakacho.*

It will be at once seen that this beautiful medal has no connection with the subjects of the foregoing remarks. I have given it a place that it might be as early as possible brought to the knowledge of numismatologists, for it appears likely to prove the very key to our knowledge of the valuable series of Kanouj coins, forming the fourth of Col. Tod; and the second Plate of Wilson.

The former author says of these coins:

"They are Hindu, of a very remote period, and have the same character which I have found wherever the *Pandu* authority existed, in the caves, and on the rocks of *Janagurr Girna*, on the pillar of victory in Meywar, and on the columns of *Indraprestha* (Delhi) and *Prayág* (Allahabad). Some of them are not unlike ancient Pehlevi. These coins are of gold, and in fine preservation. Like all my medals, they are either from *Agra*, *Mathura*, *Ujjayan*, or *Ajmere*. Dr. Wilkins possesses some found even in Bengal: he thinks he can make out the word *Chandra* upon them."

It is well known, as Lieut. Conolly remarks, "that our love for the antique has induced certain cunning men of this famed city to set up a mint for the fabrication of moneys of the olden time," and many that are brought thence bear all the marks of having been cast in the mould of some original, of which they bear so imperfect an impression that it has been hitherto impossible to assign the true nature of their inscriptions: Col. Tod, it is evident, supposed them to be in the Delhi character No. 1;—one was read as in the Mahabalipur alphabet (see vol. ii. page 412, 649): and only now do we perceive for certain that the character is precisely that of No. 2, of the Allahabad column: of which the reader may convince himself by comparing the legend on the obverse with the titles of *Chandragupta* in Plate VI. of the present volume. Applying the same alphabet to the reverse, we find the name *Sri mad-ghava kavo* or *kacho* which the Rev. Dr. Mill remarks, by a slight alteration will become Ghatat-kacho, the very name read by himself as the father of Chandragupta in the Allahabad inscription*. I must here leave this important discovery to the elucidation of our learned Vice-President, having performed my own more humble duty of making known by the pencil the prize which has rewarded my friend Lieut. Conolly's researches.

* In a paper read before the Asiatic Society on the 28th instant.

VI.—*A Brief Sketch of the Present State of Georgia, now a Russian Province. By Captain* Robert Mignan, *Bombay European Regiment, Fellow of the Linnæan Society, and Member of the Royal Asiatic Society of Great Britain and Ireland.*

The name of Georgia, which is applied by modern geographers to the country south of Mount Caucasus, lying between the Euxine and Caspian Seas, comprehends, according to the native historians, *Kartueli, Imeritia, Mingrelia,* and *Guria,* under the general name of Iberia. It is now exclusively applied to the four provinces, Kartalinia, Kakhetia, Kisik, and Georgian Armenia. According to several writers, the appellative *Georgian* is transmitted to us from the river Koor, Kooros, or Cyrus; and they add, that the inhabitants ought to be named *Koorgians.* By the Turks and Persians they have always been denominated "Goorjees," and their territory "Goorjistan."

This country must be considered as one of the most interesting on the face of the globe. It is at this moment a small canton of Russia. included within the limits of that huge empire, but happily, as yet, not governed in so despotic a manner. In the map, it is situated in the centre of the isthmus; though I shall describe it as comprising the territory between the great Caucasian ridge, and the river Arras, (the ancient Araxes) on the Caspian side; and the redoubt of St. Nicholas below the mouth on the Phasis on the side of the Euxine.

All was a blank, until the Russian CATHERINE, of notorious memory, sent GULDENSTAEDT to traverse these delightful regions, trace the rivers to their sources, make astronomical observations, examine the natural history of the country, and collect vocabularies of all the dialects he might meet with. He enumerates seven distinct nations, divided into numerous tribes, each speaking its own dialect. The Caucasian isthmus contains innumerable small nations. They are composed of indigenous and primitive tribes, although some are doubtless the remains of Asiatic hordes. Their physiognomy combines the characteristic features of the principal races of Europe, and of Western Asia. The writings of Moses, the allegory of Prometheus, the famous expedition of the Argonauts, and several traditions of the Scandinavians, all combine to satisfy us that this kingdom was one of the most ancient of the globe. We know for certain, however, that Georgia was conquered by the illustrious NOURCHIRVÁN, the contemporary and rival of JUSTINIAN; became a portion of the empire of the celebrated SULTAN MAHMOUD of Ghiznee; was invaded by ALP ARSELAN (the conquering lion); overrun by TIMOUR; ravaged by ISMAIL; conquered by TAMASP, in the reign of our ELIZABETH; reconquered from the Turks by SHAH ABBAS; that,

although thus by turns overrun and pillaged by Turks, Tartars, and Persians, it never wholly lost its independence, but preserved itself as a kingdom nearly two thousand years; and what is still more to its honor, it preserved its ancient faith in Christianity for fourteen hundred years, in the very midst of countries enthusiastically devoted to the Mahommedan religion. The ruins of walls and fortresses, commanding its passes, and perched on the summits of its mountain ridges; the remains of bridges in its streams; the ruins of palaces, churches, and baths, in the midst of which are frequently discovered coins and medals of Media, Parthia, Persia, Greece, and Rome, attest the various nations that have been in possession of Georgia in ancient times.

Towards the close of the last century, the aged Prince Heraclius, who had proclaimed himself King of Georgia, took advantage of the anarchy and confusion which existed in Persia, after the death of Kureem Khan, and by formal act renounced his dependence upon Persia, after having struggled against the depredations of its inhabitants during his whole reign, and placed himself under the protection of the Russian empress. Subsequently, however, he was obliged to abrogate his alliance with Russia, and to acknowledge himself tributary to Turkey.

At the peace in 1791, Georgia was declared independent, and in 1795, Aga Mahommed Khan, the late king of Persia, advanced to its capital. His first act was an order for the slaughter of every human being in this large and flourishing town—his next was, to set fire to it; and it was totally burnt down. Every brutal excess of cruelty that national hatred, inflamed by bigotry and infernal policy, could dictate, was committed. Pillage, murder, and conflagration met the eye on every side. While some were occupied in plundering the villas of rich merchants, and others in setting fire to the hamlets, the air was rent with the mingled groans of men, women, and children, who were falling under the daggers of the Moslems. The only exception made during the massacre was of the young women and boys, who were preserved only to be sold as slaves. Many of the women, whose husbands had been butchered, were running to and fro frantic, with torn garments and dishevelled hair, pressing their infants to their breasts, and seeking death as a relief from still greater calamities that awaited them! The number of those slain or dragged into slavery on those dreadful days was not less than twenty thousand.

In the following year, this brutal eunuch determined again to visit Georgia, but he had only reached the town of Sheesha, in the fertile district of Karabagh, when his career was arrested by the hand of violence. Two servants, whom he had sentenced to death for a very trivial offence, entered his tent at night, and with their daggers put an end to one of the

most cruel tyrants that ever ruled in Persia. It is beyond the limits of this paper to particularize his cruelties. In the first year of his government he deprived seventy thousand people of their eyes, and massacred at least a hundred thousand. In Persia (as we all know), they think no more of plucking out an eye, than we do of extracting a tooth.

On the death of HERACLIUS, in 1798, his eldest son, GEORGE HERACLIVITZ, unable to withstand the attacks and intrigues of foreign and domestic enemies, ceded his states (under a stipulation of being handsomely provided for) to the Emperor PAUL, who, deeming it safer to remove the queen and her children to Moscow, commanded that her supposed lover should make the proposal. Fixing her eyes steadily upon him, she said, "Forget not that thou art my subject—repeat not so hateful a proposal, or I shall know how to punish your audacity." Her lover persisted in his entreaties, and in an instant she drew her dagger, and laid him dead at her feet. She was, however, forcibly conveyed along with her two daughters and two sons to St. Petersburg, where they had precedence next to the imperial family, and though deprived of liberty, were liberally treated. Her youngest son, ALEXANDER, possessing an independent spirit, together with an ardent love of country, preferred liberty, although accompanied by every privation; and vowing eternal enmity to Russia, he became a wanderer in the adjacent mountains. His hatred has increased by time, although any thing like resistance to the colossal power of Russia must be perfectly hopeless, even if supported by Persia, with the ruler of which kingdom he is still in constant communication, and watching a favorable opportunity of making the endeavour to recover his lost territory.

The late Emperor ALEXANDER found it expedient to grant to the Khans, or Princes of Daghestan and Shirwan (the ancient Albania), the enjoyment of their former privileges, and indeed, to change little of their ancient customs—except that they were prohibited from selling their children to the Turks and Persians, and of executing summary vengeance on their subjects by mutilation or death. Several examples of severity did not prevent vast emigrations into Georgia. In the year 1820, alone, not less than ten thousand Persian families crossed the boundary, to whom it was intended to assign lands; and both Turks and Armenians are continually placing themselves under the Russian government. The Circassians, however, on the northern frontiers of the Caucasus, still bring up their children for the market of Constantinople. This is done by stealth, for the Russians use every means in their power to prevent the inhabitants quitting the country. In the year 1828, when I crossed the Araxes, the influx had been so great that I met thousands of both sexes, and all ages, returning again to

Persia, and execrating the name of PASKEWITCH, then Governor General of Georgia, to whom they attributed all their misfortunes, and from whom they had received the most flattering but fallacious promises.

The whole of Georgia is beautifully diversified with mountain scenery, gradually spreading out into hill and dale. The climate is delightful, and the country well watered. It is remarkable that in Persia most of the inhabited places are situated in plains and valleys : in Georgia, on the contrary, the towns and villages are almost uniformly built upon the sloping sides of hills or heights, after the manner of the hamlets of Koordistan. The scarcity of rain in Persia, and the abundance of water in Georgia, has been assigned as the reason for this difference. The melting of the snows on Mount Caucasus causes floods to pour down from the hills with such violence as to sweep every thing before them. To give an idea of the enormous masses of snow which are constantly thawing during the summer season, I will mention, that in my journey across Caucasus, in August, 1828, a piece of frozen snow had detached itself from a neighbouring peak, and shelved down across the road, covering it to an extent of *at least three quarters of a mile*, and rendering the passage nearly impracticable. The Koor, however, does not rise above its banks. Generally speaking, the climate is mild and salubrious. From April to November, the sky is for the most part cloudless ; but during the night, the dews are frequently very heavy. As in Persia, the sultry days are not unfrequently succeeded by intensely cold nights. During the other parts of the year, there is no deficiency of rain ; and to this circumstance the fertility of Georgia is chiefly attributable. The winters are generally very penetrating ; every possible degree of temperature may be had on the sloping spurs of Caucasus.

Among various indigenous productions may be enumerated the cedar, and other varieties of the pine ; the oak, the beech, the elm, the ash, the chesnut, the walnut, the apple, the pear, the citron, the peach, the plum, the apricot, the pomegranate, the raspberry, the quince, and many flowering shrubs, among which the vine entwines itself in wild luxuriance, loaded with the finest grapes. The most numerous, however, and that in which the riches of the country chiefly consist, are mulberry trees, on which they feed an infinite number of silk-worms. Georgia was famed for its silk long before this article found its way into Italy, in the reign of JUSTINIAN. GULDENSTAEDT describes Georgia as most fertile and fruitful. An Asiatic's ideas of fertility differ sufficiently from ours, to explain in part this assertion : for to him plantations of olives, almonds, and figs, with which the country is covered, suggests the same associations of plenty that are called up in our minds by rich tracts of corn land.

The same traveller characterises the country as flowing with milk and honey, and it still answers to this description; for it contains the richest pasture lands, and the rocky portions are covered with aromatic plants, yielding to the wild bees who hive in the crevices of hollow trees, such an abundance of honey as to supply the poorer classes with an article of food, and with wax to be exchanged for cloths and stuffs. Honey from the rocks is repeatedly referred to in the Holy Scriptures, as a delicious food, and an emblem of plenty. (1 Sam. xvi. 25 : Psalm lxxxi. 16.) GULDENSTAEDT instances the growth of the date tree as a proof of the mildness of the temperature, and when to these we add the oil extracted from the almond (the *amygdalus Persica*) and olive, we shall be at no loss to account for the ancient fertility of the most barren districts of Georgia, or for the adequacy of the soil to the support of so numerous a population, notwithstanding the comparatively small proportion of arable land. Delicious wine is produced in the districts, and the valleys bear plentiful crops of rice, wheat, millet, and barley; while cotton, flax, and hemp grow spontaneously on the plains bordering the Caspian.

The streams are full of fish, but with the exception of the river Koor, are all brooks or torrents, and therefore unfit for internal navigation. In short, nature has rendered it one of the most beautiful and highly favored countries in the world. Wild animals are not numerous; for every man being armed, they have ever met with constant enemies. On the plains however, there are deer and antelopes; and the pygarg (*cervus pygargus*), or dishon of the Scriptures, called in Persia *aha*, bears, wolves, wild boars, and the rock goat (*capra Caucasia*) delight in the rugged summits of the schistose mountains. The chamois, on the contrary, prefers the lower calcareous hills; as also do the hare, fox, and jackal. In ornithology I can enumerate from my own personal observation the eagle, the falcon (*falco tinnunculus*), the pheasant, the jack-daw, in the oak-woods; the bee-catcher *(merops apiaster)*, the field lark, the red partridge *(petrao rufus)*, the quail *(tetrao coturnix)*, and the ring-dove. Game is abundant, partridges in particular being found in large coveys, so fat and heavy, that they may easily be knocked down with a stick. The male species is a most beautiful bird. The females are not so prettily marked. Wild-geese, ducks, snipe, and water-fowl of every description abound in some situations. I have seen several large snakes, but the only one much dreaded is a small slender species, spotted black and white, the bite of which is said to be instantly fatal. Flies of every species are annoying in the hot-weather, and a species of ant (*termes fatalis*), is very numerous.

Georgia was formerly celebrated for its mineral treasures, but its mines have been neglected, and now produce but little. Gold, silver, and iron

are found in the mountain range of Caucasus. Coal is also said to abound in different parts of the country. STRABO goes so far as to assert that the numerous small rivers carry down gold dust in *vast quantities*, which being stopped by sheep skins, placed on purpose, furnishes an explanation of the fable of the golden fleece, *(Strabo*, xi. *passim.)*

I was assured that the total population of Georgia is four hundred thousand, of whom ninety thousand are Armenians, following chiefly the rites of the Greek Church, and partly their own. There are at least seventy thousand Russian and Georgian troops stationed throughout the districts. The number of the inhabitants is doubtless increasing, as previous to its connexion with Russia, the people were sadly reduced by the constant dissentions of the chiefs, who, possessed of unlimited power over their vassals, chose to be eternally at war with each other, chiefly, if not entirely, with a view of making prisoners of both sexes, for the harams of the Turks and Persians. The incursions of these latter, moreover, utterly desolated from time to time the provinces on the frontier. In 1603, when that accomplished despot SHAH ABBAS marched into Georgia, he carried off no less than ten thousand families; but as a striking proof of his beneficent despotism, instead of making them slaves, and compelling them to change their religion, as his predecessors had done in similar cases, he settled them in different parts of his kingdom, and afforded them every encouragement. The Armenian colony formed by him at Ispahan remains an honorable monument of his wise and liberal policy. These drawbacks, however, on population have of late years ceased, and it is said, that the measures now adopted for the encouragement of agriculture and commerce have already produced the best effects. The capital is rising from a dismal-looking town into a cheerful bustling city, and its population, which, in the year 1826, was only 26,000, has risen in four years to 33,000. It would be superfluous to allude to the beauty of the women of Georgia, which has become so proverbial. Their symmetrical form and regular features might serve as the model for the finest statues. "It is in Georgia," says the elegant GIBBON, "that nature has placed, at least to our eyes, the model of beauty, in the shape of the limbs, the colour of the skin, the symmetry of the features, and the expression of the countenance. The men," he adds, "are formed for action, and the women for love." Yet, HERODOTUS says, that the natives, in his time, were dark complexioned (μελανχροες) and had crisp, curling hair (ουλοτρικες); such is the change produced by the mixture of nations, and the slow but powerful influence of climate. The women, however, not satisfied with the prodigality of nature, have recourse to the odious use of paint; and although this is considered indicative of want of chastity, it does not prevent the beauties of Georgia using

their detestable and deleterious cosmetics. Their chief delight is in bathing and champooing, which at Tiflis may be enjoyed to perfection. The baths, situated in deep caverns,are impregnated with sulphuretted hydrogen, and their temperature I found at 112° Fahrenheit.

Georgian girls are not unfrequently married by the wishes of their parents at the early age of twelve; for, although they are not as formerly, so easily smuggled out of the country for sale; yet, the Russians are constantly seizing them to gratify their own gross and vicious inclinations. In every other respect, a spirit of forbearance is manifested towards those who have sought protection under the imperial crown: —whether it be to those hordes of barbarians which have intruded themselves into parts of the Russian territory already occupied by Russian subjects, or to those restless and infatuated beings whom disordered imaginations concerning points of religion would not permit to remain quiet in more civilized countries.

VII.—*Explanation of the Sketch giving a geological Section of the Strata from Nimach to Mérta, published in the Asiatic Researches,* vol. xviii. *p.* 92. *By* James Hardie, *Esq. Beng. Med. Service.*

[In the second part of the eighteenth volume of the Asiatic Researches, an article is published by Doctor Hardie, on the geology of Central India, exclusive of Malwa, to which a geological section is appended of the "*strata between Nimach and the British Residency at Mérta.*" Owing to the transfer of the editorship from the then Vice-President Mr. J. Calder to ourselves when the volume was half through the press (the plates being at the same time in the publishers' hands), it was not perceived that the text did not contain any specific account of this particular plate, and it was only on lately recurring to the records of the Physical Class that a separate and detailed explanation by the author was found, which it has been thought advisable to make public at once through the pages of the Journal, as some apology to Dr. Hardie, for the imperfect justice done to his geological researches. Many of our readers will be able to refer to the volume of Transactions for the plate in question, and to others the nature of the country will be sufficiently intelligible from the explanation itself, with the aid of a map, the examination being of course confined to the surface and proceeding westward from Nimach.—Ed.]

This section is not offered as being perfectly correct, but it will serve to give a general idea of the rocks which occur on the route from Nimach to Mérta. The exact limits of the different formations are not laid down with precision, the surface is in so many situations covered with soil that I found it impossible to do this. I believe, however, that the whole will be found to approximate pretty nearly to the truth. I need scarcely add, that the exact position and breadth of the different alternating beds are not intended to be represented. This could not

have been done unless the section had been constructed on a much larger scale. With the scale to which I have limited myself, a bed of several yards in breadth would have been out of proportion large had it been represented by a single colored streak. I have at the same time endeavoured to preserve, as far as my observations would permit me, the general proportions which the one rock bears to the other on the grand scale in such alternations. The line of section runs in the first instance over a waved country, and afterwards over one which is nearly level. None of the hill ranges are traversed by this section.

A, the *overlying trap formation of* Malwa, at Nimach. *B. B. B.*, the *sandstones, sandstone slates, &c.* described in page 39, of the paper in the Researches. These are continued as far as *Benautí*—surface generally covered with soil from which the strata here and there protrude: country waved and strata become more inclined as we proceed; west-dip SE. or E. On descending from the trap, the descent being gentle, the sandstones are immediately perceived, and, as we proceed west they pass into sandtone slate and lastly into the shale, &c. Numerous low detached ranges observed running on a northerly and southerly direction; none of these traverse the line of section, and only in one instance have we occasion to pass over a gentle rising ground connecting two low table crowned ranges. *C. C., the hills of this sandstone formation*, which are generally of the table shape represented, though sometimes they are conical. The *Jésalmír* stone abounds with fossil shells, scarcely a slab being free from them; they are not of the least detriment to the stone, so far as it regards its aptitude for lithographic purposes; the substance of the shell appearing to have become homogeneous with that of the stone in which they are imbedded.

Resting on the sandstones and forming the tabular summits of the hills occur, *D. D.*, the *quartzose breccia*, described page 49. To the west of the *Bárí* hills occurs E, *a yellow-coloured argillaceous limestone*, of a compact texture, consisting of about 75 per cent. of earthy carbonates. It contains a small proportion of magnesia, and is coloured by iron, which last exists in pretty considerable proportion. The relative position of this limestone to the sandstones could not be correctly ascertained. A little to the north of *Benautí* occur the limestones described in page 43. These occupy gentle rising grounds.—I could not discover any organic remains in the yellow limestone, but I have not examined it minutely enough to speak with decision on this point.

The other limestones are purer and less ferruginous. They contain from 84 to 88 per cent. of earthy carbonates, but both the above varieties have a small proportion of carbonate of magnesia associated with the lime. A thick bed of *kankar* and soil covers the junction of the

yellow limestone and the sandstones; this bed is of considerable breadth: both however dip to the east at a considerable angle; and as the limestone occurs to the west of the sandstones, the former may possibly dip under the latter, and the series of formations of the narrow bed described in my published paper, may be thus completed.

F, a hill composed of the out-croppings of the quartz formation which shews itself further west. *Benautí* is situated at the base of this hill.

G. G. G. Quartz rock as described page 31. It alternates with *H. H. H.* &c. which is the rock described as an *imperfect variety of granite rock.* It has a porphyritic structure, and might almost be classed with the porphyries. It is however indistinctly stratified. In travelling from *Benautí* to *Nakum*, as far as the yellow limestones occurs, the surface is generally covered with soil from which the limestone occasionally protrudes; but on passing the limits of this vast formation, a very narrow bed of a slaty argillaceous rock presents itself, and this is immediately succeeded by the quartz, which rises occasionally into craggy and rugged hills, and the outcroppings of the highly inclined, and in many situations almost vertical, strata of which are constantly observed. The line of section traverses a *hill: also composed of quartz. I,* The separate section, *K.* is an imperfect representation of a hill composed of quartz which occurs to the east of *Nakrum.* The slope in the direction in which the strata dip is abrupt and destitute of soil. In the opposite direction, it presents a bluff rugged face and which rises abruptly from the slope; *M. M.*, the slope in this direction being more gradual. The hills at *Nakrum*, which are also of quartz, exhibit something of a similar appearance: these rise about 300 feet above the level of the plain. *The bluff crag L* occupies the highest position of the ridges, and the hills slope on either side their summits, presenting bare perpendicular cliffs, rising abruptly to the east and west from the slopes, which last are covered with stunted trees. From *Nakrum* to *Mangarwár* the surface, for the first half of the distance, is usually covered with soil, from which occasionally protrude the quartz and the granitic rocks; *H. H. &c.* As we proceed west the quartz becomes purer and more transparent. It frequently assumes a nearly slaty structure, in consequence of minute plates of mica being parallel to the stratiform structure. Thus far the surface is nearly level It afterwards becomes very gently undulating, and the out-croppings of the quartz strata are occasionally seen occupying the gentle swells. This quartz now appears to alternate with or rather there occur inclosed in its narrow beds of argillaceous schist, the quartz being the preponderating rock till within about three miles of *Mangarwár*, when the argillaceous schists become more plentiful. At and near *Mangarwár* the argillaceous schists pass into and alternate with greenstone schist

and a hornblende rock of a large grain. The last is composed of longish portions of hornblende of a shining aspect, which constantly intersect each other, and with this is associated a grey crumbly felspar. To this quartz is frequently added, in which case it forms a variety of sienitic granite. The greenstone schists are of a dark green color and of an uniform texture, they are apparently composed of similar ingredients to the last, but in a more minute state of aggregation. The argillaceous schists are of a greenish grey color; they are rather soft, and some of them seem to approach to chlorite schist; scales of mica sometimes occur disseminated through these. The alternating quartz beds frequently assume a greenish tint. This is particularly observed where they occur in contact with the greenstone.—*N. N. N.* &c. represent the above series of argillaceous schists, greenstone schists, &c. The country, after living *Nakrúm*, is characterised by its level and unbroken aspect; the gently undulating appearance alluded to, being scarcely observed on the large scale, and the hills in the neighbourhood of *Mangarwár* more deserve the name of low rounded swells. On leaving *Mangarwár* the route lies, for the first five miles, over an uncultivated level plain, covered with soil, and, in one or two instances, outgoings of strata of pure white quartz are observed. From this it is probable that the alternations observed, to the east of *Mangarwár*, are continued thus far. About a mile from *Híta* we observe a very fine-grained granitic rock, composed of a pale reddish felspar, semitransparent quartz, and mica; the last in very small proportion, and in some situations, entirely wanting. This rock frequently assumes something of the structure of gneiss.—At *Híta* we also find this granite, and, associated with it, another variety of a larger grain, composed of white quartz, greyish white felspar, of a soft and friable nature, and a very dark colored mica, the last in great abundance. Shortly after leaving *Híta*, beds of *greenstone schist*, *N. N.* approaching to argillaceous schist, alternate with the close-grained granites for a short distance, and afterwards granitic rocks inclosing beds of quartz are alone observed. A similar granite to the large grained variety of *Híta*, also, occasionally presents itself, but the mica is in much smaller proportion. As we proceed west the felspar acquires a redder tint, and the large-grained granites here and there are seen: the fine-grained varieties preponderate. The mica in the fine-grained granites is frequently of a greenish color, it also occurs nearly black. Hornblende too, occasionally occurs: and this, as we proceed west, appears to be replaced in many instances by actynolite, which is found as a constituent of these granites. *O. O. O. the granitic rocks just described*, are generally speaking stratified, and many of them have a structure approaching to that of gneiss. This is even observed in several of the

varieties composed entirely of quartz and felspar; these two ingredients, being arranged in nearly parallel grains of a prismatic form, the felspar frequently entirely surrounding the longish grains of quartz, and giving rise to a porphyritic structure. The felspar is the principal ingredient in these granitic rocks or perhaps granitic gneisses.

Q. The *waved sienitic gneiss,* similar to that described in a former paper, as occurring at *Karábar.* The country where this occurs is generally covered with soil, but in one or two instances it presents itself at the surface. *S. Primitive dolomite;* it occurs regularly stratified, the surface where exposed, having acquired a dark earthy aspect. The fresh fracture is coarse-grained and crystalline: some of the crystals being of rather a darker color than others, and the whole being of a smoky grey. It is almost entirely dissolved in nitric acid, and is composed of carbonate of lime, with which a considerable proportion of carbonate of magnesia is associated. This is succeeded by alternations of granitic rocks, *W. W. W.*, and hornblende rocks, *X. X. X.* The granitic rocks of this series are very various, some are large-grained, and are composed principally of flesh-red felspar and white quartz; some are fine-grained; many of them almost compact, composed of similar ingredients but are of a lighter colour. In both mica occasionally occurs, but in very small quantity. It is sometimes dark-green and at others greenish yellow; the quantity of mica varies much in different beds, and is very frequently entirely wanting. Sometimes too a granite rock occurs, principally composed of whitish or pale red granular felspar, to which quartz, mica or chlorite are occasionally added in small proportion. In many of the fine-grained granitic rocks, &c. minute yellowish green specks of *epidote* are observed. Some additional remarks on the above rocks will be found in my memoir. *The hornblende rocks X. X. X.* exist in the form of a nearly pure hornblende rock, and to this last felspar of a grey color is occasionally added. When quartz exists in any quantity in these, they pass into sienitic granite. Hornblende schist is also common, and with this a small proportion of felspar is occasionally associated, making it sometimes appear to pass into sienitic gneiss.

An idea of the form of the hills near the line of section may be gathered from the slight uncoloured sketch placed over the different formations. The line of section however does not traverse any of these. The general dip of the strata is to the N. E. and after leaving *Nakrúm* their position is nearly vertical.

N. B. *Mérta* is distant 12 miles from *Oudaipur.* It lies to the east, and a little to the north of the latter city.

VIII.—*Latitude of the Church Bungalow at Nasírábád, by altitudes* (170) *of Polaris out of the Meridian, observed with a Troughton's* 18-*inch Altitude and Azimuth circle, by* Col. Thos. Oliver.

[We use the privilege allowed as by the author to omit the details of observations, and confine our publication to the following abstract carefully calculated by the author himself from them. We trust that the Church *Bungalow* will soon become a more permanent structure ; it is a constant complaint of astronomers in this country that points of reference are not to be had.—Ed.]

Date.		Horizontal point.	Mean of 5 observations on each face.	Mean in each position of Microscopes.
		°	° ′ ″	° ′ ″
December	25th, 1831.	0	26. 18. 03.0	
	28th,	0	01.7	
January	2nd, 1832.	0	03.8	26°. 18′ 03″.2
	3rd,	0	03.2	
	4th,	0	04.5	
	5th,	20	08.4	
	6th,	20	07.5	0.90
	24th,	20	09.9	
	25th,	20	10.2	
	26th,	340	03.0	
	29th,	340	17. 58.8	01.3
	31st,	340	18. 01.4	
February	1st,	340	02.1	
	21st,	330	17. 59.9	
	26th,	330	18. 01.7	01.5
	27th,	330	01.6	
	28th,	330	02.6	
Mean of the whole,				26. 18. 03.8

The observations were conducted thus : five sights were taken with the face of the circle east or west as it happened, the level (both ends) being read off and noted after each sight. The instrument was then turned round 180° in azimuth, and five more sights taken as before. The correction for level (that is, the mean of the ten readings) has been applied to the numbers in the column headed " Microscopes." I have used Dr. Young's refractions, and the position of the star, as given in the Greenwich Ephemeris.

The Microscopes of the Altitude circle having a motion of about 60° concentric with the circle, I occasionally availed myself of this contrivance in order to get readings on different parts of the circle, and to get rid of errors of division ; but I regret that I did not make more use of this expedient, since so wide a result appears when the Microscopes were placed at 20° from what the other positions give. The instrument is now at the Lucknow Observatory, where I did hope that, in the hands of my lamented friend Herbert, it would have had fair play ; but he, poor fellow, died very soon after he received it.

IX.—*Population of the City and District of Allahabad, in* 1831-32.

To the Editor of the Journal of the Asiatic Society.

Sir,

The inclosed census of the town of Allahabad may be considered more accurate than that published in a former number of the Asiatic Society's Journal. Kyd-gunj adjoins the town, and should be considered a portion if it. Dara-gunj, situated on the banks of the Ganges, may be held as a suburb. The census of the whole district or zillah of Allahabad, is a mere approximation to the truth; it has not in consequence been deemed necessary to detail the population of each pergunnah. Some of the returns, from which the total was obtained, were drawn out several years ago by the police officers, other were drawn up by revenue officers. The revenue (land, abkaree, and stamps) drawn from the district amounts to about 20,90,000 Rs. whence the payments of each person will be nearly 2.68 rupees yearly.

Your's obediently,

D. S.

1831 and 32.	Houses.	Musulmans.					Hindus.					Grand Total.
		Men.	Women.	Children. Males.	Children. Females.	Total	Men.	Women.	Children. Boys.	Children. Girls.	Total.	
Kotwalee chouk,	1742	900	889	323	364	2466	1746	1488	726	723	4683	7149
Badshah Mundir,	3987	2397	2679	1031	1116	7223	4391	4503	1281	2366	13041	20264
Dureabad, ...	826	722	826	311	404	2263	1111	1269	520	714	3614	5877
Kholdabad, ...	1486	1295	1471	474	500	3740	1174	1206	543	549	3472	7212
Ahmuty-gunj, ..	1178	347	293	122	134	896	1426	1155	491	581	3623	4519
Total, ...	9219	5661	6158	2251	2518	16593	9850	9621	4061	4903	28433	45021
Dara-gunj, ...	2084	578	602	270	258	1703	2551	2547	1029	1218	7345	9103
Kyd-gunj, ...	2663	760	844	390	379	2373	2904	2841	1158	1485	8288	10661
Grand Total, ...	13966	6999	7604	2911	3155	20669	15203	15009	6298	7606	44116	64785

District of Allahabad, exclusive of the town approximation,	Houses.	Hindus. Males.	Hindus. Females.	Total.	Musulmans. Males.	Musulmans. Females	Total.	Total.
	1,43,737	2,51,789	3,02,417	5,54,206	90,531	70,678	1,61,209	7,15,415
							Grand Total,	7,80,190

Allahabad, May, 1834.

D. S.

X.—*Proceedings of the Asiatic Society.*

Wednesday Evening, the 28th May, 1834.

The Rev. W. H. Mill, D. D. Vice-President, in the chair.

The Proceedings of the last Meeting were read.

Messrs. Wm. Martin, Robert Spiers, and Capt. William Foley, proposed at the last Meeting, were elected members of the Society.

Read a letter from W. E. Frere, Esq., Secretary to the Bombay Branch of the Royal Asiatic Society, conveying its thanks for the XV. and XVI.

volumes of the Asiatic Researches, and announcing that Mr. WALTER ELLIOT, of the Madras Civil Service, had placed in his hands, for presentation to the Society, 20 copies of the ancient Canarese Alphabet, lithographed in Bombay through the liberality of the Right Honorable the EARL OF CLARE.

Library.

Read a letter from J. VAUGHAN, Esq., Librarian of the American Philosophical Society, forwarding on behalf of ISAAC HAYS, Esq. M. D. descriptions of the fossil Mastodons in the Philadelphian Museum.

The following books were presented:

Malatimadhavæ, Fabulæ Bhavabhutis, actus primus, ex Recensione Christiani Lasseni, Prof. BONN.—*By the author.*

Gymnosophista, sive Indicæ Philosophiæ Documenta: 1 fasciculus, by Professor LASSEN.—*Ditto.*

Journal Asiatique, No. 70.—*By the As. Soc. of Paris.*

Meteorological Register, for April, 1834.—*By the Surveyor General.*

The following books received from the book-sellers:

Lardner's Cab. Cyclopedia, Middle Ages, 2nd vol.

————————, British Admirals, 2nd vol.

Library of Useful Knowledge, Lives of Eminent Persons.

Museum.

A large Asamese ornamented chhatta was *presented by Dr. Burlini.*

A stuffed Saw-fish, eight feet in length—*purchased.*

Two boxes of geological specimens, collected in the course of a survey of the river Satlej, from Ludiana to its confluence with the Indus—*presented by Captain C. M. Wade.*

Antiquities.

Read a letter from H. WALTERS, Esq. forwarding fac similes of the inscription on the Ramree stone, and a rough translation in Persian and English, made by himself, with the aid procurable in Arracan.

The stone was found in Ramree. It had been brought from a temple somewhere in the island to Kyúk Phyú, whence it was shipped off, both to serve as a specimen of the sandstone of Arracan and as a curious monument: there were several similar in different parts of the province.

Mr. WALTERS also forwarded specimens of shells encrusted with stalactite from the Musmye Cavern, Silhet; this cave is remarkable for the sparkling purity of its calcareous encrustations, which give it a singularly clean and imposing appearance.

The Secretary submitted the fac simile of an inscription in the Burma language, and Pálí character, found at Gya, and copied by the pandit in attendance on the Burmese ambassador, with a translation of the same, as explained by RATNA PAULA.

[Printed in the present number.]

Read extracts of letters from B. H. HODGSON, Esq, resident at Népál, on the subject of inscriptions in the character No. 1, of the Allahabad column, and forwarding a native drawing of the *Matthia Lat'h,* situated in a wilderness, between *Bettiah* and the *Gandak* river, in the *Sáran* district, with an accurate transcript of its inscription. Also an accurate fac simile

of an inscription from the Ságar territory, which proves to be in old Sanscrit character, (No. 2.)

These inscriptions, Mr. Hodgson says, were communicated to the Asiatic Society, eight or ten years ago, but no trace of them could be found among its records: fortunately he has preserved the originals, from which we shall take an early opportunity to make engravings for publication, together with the author's remarks upon this and three other *Lat'hs* in North Behar of a similar nature.

The Vice-President exhibited a fac simile of an ancient inscription in the same character, No. 2, from the iron pillar at Delhi, carefully taken off at his particular request by the late Lieut. Wm. Elliott, of the 27th N. I. in the year 1831.

Read extracts from Dr. J. G. Gerard's letters to the Secretary, communiating further information of Mr. Masson's proceedings in the examination of the Afghan topes.

Mr. Masson's letter contained copies of an inscription found on a box extracted from a tope at Jelalabad, by himself, in the same character, as that on the cylinder from Manikyála, and bearing strong resemblance to Sanskrit.

Dr. Gerard gives the following account of the disasters which befel Mr. Martine Honigberger, on his route homeward: he had fortunately left the chief part of his collection of relics with General Ventura.

"I beg to notice here the misfortunes which have attended Mr. Honigberger's journey from Kabúl across the Hindú Kúsh mountains, in progress to Balkh and Bokhara, in the hopes that they will become known through this medium to his friends and countrymen in Europe. Mr. H. reached Bamián in safety, and left it, to all appearances, without apprehension, but was almost immediately beset by a party of horsemen, who began a promiscuous plunder of his property, first binding the traveller hand aud foot, and then threatening him with instaut death, which seems to have been most fortuitously averted; the gang declaring at the same time that they had the authority of the governor, at the instance of Dost Mahomed Khan, for the act; but this I can scarcely credit, at least am very unwilling to trace it to such a source, though suspicion is implicated in the mystery at present. After the timely intercession of one of the party, Mr. Martine was untied, but he lost his arms, which were valuable, and all the cash he had on his person. In the struggle, the Kafila Bashi', the same man who conducted Mr. Burnes and myself safely to Balkh, received several slight wounds in attempting to defend his charge. The party then resumed their journey, having been ordered direct to Khúndúz by the chief Mír Morad Beg, which my informant considered by no means inauspicious, since Mr. Honigberger's treatment at Bamían was likely to plead favourably with the Usbek tyrant. Nothing further was heard of him till a few days ago, while I remained at Lahore, Mons. Allard received a letter from himself, dated *Khulm*, stating that he was on route to Balkh, and an open road before him. A large town in the northern base of Hindú Kúsh, in the vicinity of the Oxus, where Mr. Burnes and myself supposed we were prisoners."

The Secretary submitted to the inspection of the Meeting several ancient coins, procured at Kanouj, by Lieut. A. Conolly, amongst which was one gold coin of Hindu fabrication, peculiarly interesting from the legibility of its inscription and superior excellence of its workmanship.

[A drawing aud notice of this coin is given in the present number.]

The Secretary also laid on the table an extensive collection of ancient coins, received through Capt. WADE and Lieut. CONOLLY from Mulvi SHEKH KERAMAT ALI, now residing at Kábúl, on the part of the British Government.

SHEKH KERAMAT ALI is well known as the companion of Lieut. A. CONOLLY in his journey from Persia to India, of which an account was printed in the GLEANINGS, vol. iii. page 346. On quitting Calcutta, in 1832, to join his new appointment, he carried with him copies of all the plates of ancient coins up to that time printed, and others were afterwards forwarded to him, to assist him in the search he zealously undertook to make for Bactrian and Hindu coins, then only sparingly known to us. Later in the field, and bringing none of the knowledge of the subject possessed by his European competitors, his comparatively undirected efforts have been wonderfully successful: the collection now transmitted comprises numerous coins of APOLLODOTUS, MENANDER, HERMÆUS, EUCRATIDES, KANERKOS, KADPHISES, and indeed almost all of those enumerated by Mr. MASSON's Memoir, besides some very curious Parthian and many gold and silver Hindu coins.

In all, the packet contains gold coins, ...	8
Silver ditto, ...	128
Copper ditto, ...	247
	383

[An account of such coins as are new, will be published hereafter.]

Papers read.

Dr. GERARD's Memoir on the Topes of Afghanistán.

[This paper will be noticed in a subsequent number.]

Observations on the Allahabad Inscription, No. 2. with a translation. By the Rev. W. H. MILL, D. D. Vice-Pres. &c.

Dr. MILL has succeeded in restoring completely the main portion of the inscription; of which he presented a transcript in Modern Devanagari, on a large scale, interlined with a verbal translation in Latin. The Vice-President read his version of the same in English, which we shall have the pleasure of presenting to our readers in the next number of the Journal.

XI.—*Scientific Intelligence.*

Willard's Treatise on the Music of Hindustan.

With the exception of Sir WILLIAM JONES' valuable and learned essay in the third volume of the Asiatic Researches, we have had little information on the music of the Hindus, beyond a notice of the adaptation of the rags to the different seasons and hours in GILCHRIST's Hindustani Grammar, and occasional cursory (generally disparaging) mention of the existing practice of the art at nâches, in noisy processions, or on the ghats, by travellers ill capable of appreciating the peculiarities of the science of sweet sounds among the nations of the East. The instruments themselves are pretty well known; SOLWYN's magnificent work contains accurate drawings of most of them, which have been copied into other more popular works.

The present volume therefore, a child of long promise, and consequently of high expectation, was received with avidity, as the author was known to be a skilful

performer himself on several instruments, and to have enjoyed local advantages of observation from his appointment at the native court of the Nawab of Banda: neither has his little volume disappointed us, being a familiar and pleasing account of his subject, intended for the general reader, and rendered more inviting by frequent allusion to the music of the west both ancient and modern. An author in the present day labours under evident disadvantages, in attempting to describe what the music of the Hindus was in the flourishing period of their literature and religion, when poets and priests were also musicians, modulating and singing their own compositions. To have pursued the subject as an antiquary, would have required extensive knowledge of Sanscrit, and sufficient familiarity with the varied metre of its heroic, and erotic poetry, to do without aid from native professors; for the present cultivators of the science are for the chief part of the most ignorant and abandoned classes; so that the very art is held to be disreputable among the more respectable ranks, just as among us the noble drama is forsworn by many, from the abuses which have crept into our theatres. Still in these degenerate days there are exceptions, and the sacred *Vin* may occasionally be heard pouring forth a strain of rhapsody that carries the imagination back to the fabulous age of *Rishés* and *Gandharbas*.

Our author treats successively of the gamut, of time, of oriental melody, rags, and raginees, (giving a long catalogue of compound rags,) instruments, vocal compositions, and of the peculiarities of manners and customs exemplified in the songs of Hindustan. Then follows a brief account of the most celebrated musicians, a copious glossary of musical terms, and copperplate tables of the varieties of time or metre with their native characters and values.

"The musicians of Hindustan never appear to have had any determined pitch by which their instruments were regulated, each person tuning his own to a certain height, adapted by guess, to the power of the instrument and quality of the strings, the capacity of the voice intended to be accompanied, and other adventitious circumstances. From this it may be observed that it is immaterial which note is designated by which letter." Sir WILLIAM JONES makes the *Kharaj*, or key-note, on the *Vín*, to correspond with A, but the author thinks it would be more systematic to tune it to *ut* or C, the key-note of the natural scale of Europe. This depends upon whether it was the intention to speak of the diatonic intervals, or of the absolute pitch of the instrument. "The notes of an octave are divided into 22 minor subdivisions instead of twelve semitones, as is done with us: these are called *srúti*, and each of them has a distinct name assigned as follow:

	Soor.	*Abbreviated for solfaing.*	*Srutis comprised.*
C.	*Kharaj*,....	*Sa*.....	Butra, Cumodutee, Mundrica, Chhundavutee.
D.	*Rikhab*,....	*Ri*.....	Duyavatee, Ructica, Runjunee.
E.	*Gandhár*, ..	*Ga*.	Sivee, Crodhee.
F.	*Maddham*,..	*Ma*.	Bujra, Prusarunee, Preetee, Marjunee.
G.	*Pancham*, ..	*Pa*.....	Kshutee, Ricta, Sidpunee, Ulapunee.
A.	*Dhyvat*,....	*Dha*.	Mundutee, Rohinee, Rummya.
B.	*Nikhád*,....	*Ni*.	Oogra, Joobhanka.

The intervals between the first and second, fourth and fifth, and fifth and sixth notes are divided into four parts; those between the second and third, and sixth and seventh, each into three parts; and those between the third and fourth, and seventh and eighth, which with us are reckoned semitones, each into two parts."

Captain WILLARD asserts under the division 'time,' notwithstanding the authority of TARTINI and Dr. BURNEY, that no musician can execute measures of five notes in a bar,—"There is *beautiful melody* in Hindustan comprising *seven* and other unequal number of notes in a measure, and that they *have* musicians in abundance that are able to execute it." We should much doubt this fact.

Indian Harmony is mostly confined to a monotonous repetition of the keynote during the flights of their vocal or instrumental melody; for it is melody which has ever constituted the soul of the national music in India as among the Greeks and Egyptians. Our author has the following general observations on this subject.

1. Hindoostanee melodies are short, lengthened by repetition and variations.

2. They all partake of the nature of what is denominated by us Rondo, the piece being invariably concluded with the first strain, and sometimes with the first bar, or at least with the first note of that bar.

3. A bar, or measure, or a certain number of measures, is frequently repeated with slight variation, almost *ad lib.*

4. There is as much liberty allowed with respect to pauses, which may be lengthened at pleasure, provided the time be not disturbed.

The author corrects Sir WM. JONES' rendering of *rág* by the expression 'mode, or key, for which the Hindús have the distinct word *t'hat*:—*rág* signifies rather '*tune*' or '*air*.'

The personification of *rágs* and *raginees*, and the series of pictures called *ragmalas*, are too well known to require any remarks; it would have increased the interest of the work to European readers had the descriptions of these been accompanied by engravings of a selected series of drawings, but we are aware that this could not have been easily done in India. The sixteen melodies set to music (always excepting the impossible 7-quaver airs) form however, an interesting part of the author's labour; the effect of metre is strikingly marked in some of these airs.

We cannot resist pointing out the close resemblance of the 9th (a Persian ghazal,) to the hexameter verse; by transposing the first and second section in each line and adding one long foot the metre becomes perfect:

Ashvagarí dil burda za man (*tá*) jalva numáí,
Kajkulahí zarrín kamarí (*ham*) tanga qubáí,
Man bavasálasn ky rasam ín (*ast*) bas ki baráhash,
Kháka shavam rôzí (*tá*) bôsam (*man*) kafi páí.

which may be anglicized in the metre of the original;—

(Dil burda za man—ashvagarí—jalva numáí, &c.)

Oh thief of my heart, eye me not so—shining so brightly
With head dress awry—girdle of gold—bòddice bound tightly—
When, when shall we meet! Ah not in life—not till my ashes
Lie strew'd in thy path—kissing thy feet—treading so lightly.

2.—*Representation in Roman Characters of the principal Asiatic Alphabets.*

Mr. TREVELYAN has done an eminent service to literature, and to the Asiatic Society in particular, by standing forth as the advocate of Sir WILLIAM JONES' mode of expressing native characters in the Roman Alphabet. The cause had nearly become desperate, both from the influence and popularity of the Gilchristian system*, and from the adoption of a modification of the latter by the Gov-

* These are the only two radically opposed systems, taking the characters of the vowels as the most obvious test: the numerous modifications of the consonants are of minor importance.

ernment in its surveys and records ;—when, we may say, the scale has been turned by one whose official situation, and whose zeal in the cause, promise all the success that human efforts can command. The scheme has been printed and circulated extensively ;—it has been adopted in the Persian office :—and in school-books now printing by the promulgator: while on the other hand all the learned oriental societies and their members have ever pursued it, and will rejoice in lending it their renewed support. The distinctions and marks introduced to discriminate the different classes of letters (guttural, nasal, &c.) are judicious, and can hardly be esteemed a departure from Sir WILLIAM's scheme, while their occasional omission will be no stumbling block to the scholar, whose memory will recur to the original orthography of the word in the oriental character. We wish that all contributions to the Journal could be made to conform to the system; but with Europeans this necessarily presupposes an acquaintance with the native characters, otherwise the fallacious ear must ever continue to guide the traveller's pen as he puts down names and places in his note-book. The promulgation of our author's scheme will however now serve the double purpose of teaching the European alphabet to the natives, while it makes theirs known to us in return. That it will have the further effect of displacing the Nagari and Persian alphabets as expected by the originator, is a point of which the discussion may be safely postponed for a few hundred years ! It is not contended that existing knowledge can or ought to be suppressed ;—that during the *transition* period, books are not to be furnished in every type for which there is a demand ;—but it is assumed that the superiority of the *reformed* system will be gradually perceived, and that " the native alphabets, retiring before the Roman, and being naturally displaced by its incumbent and increasing weight, will eventually without violence or alarm, disappear from off the land."

We feel no disposition to contend against the speculative *possibility* : the question requires too many concurrent data, to be made the subject of rational argument :—and as to the abstract advantages of an universal alphabet, they will be as readily granted by all men as those of an universal language.—All we would maintain is, that efforts should not be relaxed in spreading the blessings of education through the medium of the native languages and the native alphabets, in anticipation of the sudden and miraculous substitution of a type utterly foreign to the vast majority of the population.

XII.—*European Science.*

Remarks on the Report of the First and Second Meetings (1831 *and* 1832) *of the British Association for the Advancement of Science. By* D. Butter, *M. D., Surgeon, Bengal Establishment.*

Four years ago, BABBAGE and BREWSTER sounded the alarm of "British science in danger !" and well have the philosophers of England responded to the summons. The recent publication of this admirable report will constitute an important era in our history : it is indeed impossible to calculate the full results of this organization of the scientific strength of the country. The plan adopted, of publishing an account, by the most competent associate, of the recent history and actual state of each department of science, is a signal boon conferred upon its admirers in all parts of the world, more especially upon residents in the more distant parts of the empire, where the original sources of such information are inaccessible. The peculiar excellence of these treatises consists in their shewing, upon good authority, and up to a recent date, the exact points where knowledge terminates and

ignorance begins; thereby indicating the most promising lines of investigation for future explorers, and obviating all the useless and ungrateful labour of re-discovery.

Perhaps the most finished of these essays is Mr. AIRY'S astronomy. He notes, as characteristic of its progress in England, during the present century, an exclusive atteution to the perfection of instruments, and a zeal for accumulating observations, which remain useless until they are reduced and applied by the expert and ingenious analysts of the continent. But how many thousands of these must be lost in their original form, for ever unknown to the skilful metallurgists, who could extract the valuable metal from this heap of ore! The public gratitude will not be withheld from those who thus sacrifice fortune, time, and health, to the comparatively humble toil of observation, and it will be long before the Baconian mode of seeking for truth can be undervalued; but surely there is a savour of ultraism in this bliud devotion to the occupation of storing up barren facts, to the total neglect of moderate generalization. It should not be forgotten that, in nearly all the physical sciences, several of the most brilliant discoveries have been the result of happy *guesses*, which gave a new and infinitely more productive direction to the views of investigators. Astronomy, in short, is in want of what LYELL has so ably done for geology. Conclusions, bearing to each other the most striking relations of analogy, are allowed to stand as ultimate and isolated facts; while by connecting them, not only would their own authenticity be more firmly established, but they would directly lead to others which might without this aid be unattainable.

Thus the recent annals of astronomy are full of scattered evidences of a constant process of *uncompensated attraction*, whereby nebulæ are converted into stars, and separate stars converted probably into binary or multiple systems. Instead of regarding the proper motion of the stars as merely the result of the universal law by which they all tend to approach one another in times inversely proportional to their respective masses, and to the squares of their respective distances, even the enlarged mind of Sir JOHN HERSCHEL has been employed in a fruitless attempt to shew that the only real change of this kind now in progress is the mutual approach of our sun and Hercules, and that the proper motions of other stars are merely a perspective appearance occasioned by their being situated at very different distances from our system. There can be no doubt that many of them depend upon this cause; but this attempted restriction of a universal law to a single case is a retrograde step in generalization, and an admitted failure. It seems, on the contrary, highly probable that *all* the stars of the greater magnitudes are approaching our sun in nearly right lines, and are destined, millions of ages hence, to form multiple systems with our sun, and some of the stars in the constellation of Hercules; whence would arise the necessity of a new creation of organized beings, fitted to exist in the temperatures which would be produced by this new order of things. The complication of attractions to which each star is exposed during this accelerated approach must render the case of actual collision between any pair of them a very uncommon occurrence; instead of impinging upon, they will *pass* each other, and will thenceforth revolve in ellipses having their common centre of gravity in one focus. That such a process of condensation is going on, we have not only the evidence of the otherwise inexplicable apparent *separation* of the stars of Hercules;—the rest of our nebula is undergoing the same change, the milky way visibly "breaking up," as Sir W. HERSCHEL expressed it, in many places into similar

detached groups. This is the unavoidable result of the subjection of a *finite* universe of moveable bodies to the law of gravitation, uncompensated by any projectile force acting tangentially to the radius of the system.

The precipitation of *meteoric stones* upon the earth is,in all probability, another consequence of inadequately restrained gravitation. The cloudy form in which they first appear in the heavens, the light and detonation which precede their fall, and the ignited and occasionally simi-fluid state which they immediately afterwards present, all go to prove that, until their immersion in the earth's atmosphere, and their subjection to its pressure, these bodies existed in a gaseous form, and were cometary satellites of the earth, invisible when at a great distance, by reason of the smallness of their size. It seems therefore reasonable to conclude, that in the event of any portion of a great comet being drawn within the sphere of the earth's attractions, the result would be a precipitation of meteoric dust, and stones of various magnitudes, from the smallest aerolite up to the largest meteoric blocks, such as have been found in Greenland and on the plains of Russia and America.

A cause, which will accelerate the fall of these bodies, especially of those which confine their gyrations to one sun or planet as a focus, is the long doubted, much ridiculed, but now universally acknowledged ETHER of Sir ISAAC NEWTON, whose bold and fortunate conjectures regarding the existence of this medium, and the combustibility of the diamond, will ever be remembered, among the proudest triumphs of the human intellect. By opposing to the projectile force of these vapoury masses a continual resistance, greater* perhaps the nearer to the sun and planets, their centrifugal force will at last be so far weakened that collision with a sun or planet must ensue. As meteoric dust and stones have in all ages fallen upon the earth, so will the comets of ENCKE and BIELA, now entangled within our sun's exclusive† attraction, be finally thrown upon that luminary: the chances of their striking a planet or even approaching so near to one as to suffer a deflection of course, which would again throw them out of the solar system, are too minute for calculation. That the dense planets themselves and their satellites similarly suffer a constant retardation, constantly approach their foci, and would in time come in contact with them, cannot be doubted without calling in question the universality and *equality* of the law of gravitation; but their comparatively great inertia makes the change so slow as to escape observation, and the major axis of each planet's orbit is practically considered as of invariable length‡.

* ENCKE's comet has been observed to contract its diameter as it approaches the sun, whence it may be inferred that the etherial medium has there a greater density, occasioned by its gravitation to the sun, and consequently a greater pressure upon the gaseous mass of the comet, and a more powerful resistance to its motion.

† It may be conjectured that many of the comets of immense period never have their perihelion twice round the same sun, but travel in a zigzag course over the whole extent of our nebula in the milky way; their projectile force being always sufficiently great to carry them within the attraction of stars different from those where they had their last perihelia.

‡ The resistance of the ether must give an eccentric form to the earth's atmosphere, and increase the pressure upon that side of the earth which is most *forward* in its orbit. The same resistance must tend to retard the earth's revolution round its axis, but a counter-balancing agent is here at work—the shrinking of the earth by cooling, which would have an opposite effect.

It appears extremely probable that those *meteors* which are observed to move horizontally over extensive portions of the earth's surface would, if watched to the end of their course, be found to terminate this by an explosion and fall of aërolites. It is also probable that the only remaining phenomenon of analogous character, that of *falling stars*, which may be constantly seen to occur in the field of a large telescope, is a case of precisely the same kind—minute cometary clouds, condensed and burnt into dust by the pressure and oxygen of the atmosphere, with the extinction of light which would follow such condensation and combustion*.

An apparent exception to the general process of attraction presents itself in the case of a few fixed stars, which are supposed to have been changed into nebulæ. It is more probable that no such change has occurred, and that the mistake has happened through the insufficient power of the telescopes of early observers.

Mr. AIRY's paper gives no elucidation of that strange phenomenon, so brilliant in this climate, the zodiacal light, which by its form and position would appear to be a solar atmosphere; while we know for certain that, *if all its parts have the same angular velocity of rotation as the body of the sun*, no such atmosphere can extend to such a distance from the sun without being entirely carried away by its centrifugal force.

Another subject which more comprehensive views could not fail to elucidate is the TEMPERATURE of the solar system and of the medium which surrounds it.

FOURIER concludes that the temperature of *the whole of the planetary space*, or rather of the ether which fills it, is about 58° Fahr. But if this ether obey the universal laws of gravitation, as it is reasonable to infer from general principles must be the case, and as the contracted bulk of ENCKE's comet, near its perihelion, may be said to prove; moreover, if, as is probable, this ether be highly mobile and obedient to the laws of latent heat, its density must be greater in the vicinity of the sun and planets, and each atom of ether in approaching the sun or planets must have its temperature raised by the partial loss of its capacity for heat, and will again lose this heat in moving away from the sun or planets: whence it will follow that the etherial temperature must be higher in the neighbourhood of the larger of these bodies, and that FOURIER's deduction concerns only that portion of the ether *which immediately surrounds the earth's atmosphere.*

If we suppose the whole solar system to have been at its creation endued with the same temperature, and if we consider its members as so many liquid spheroids, subjected to the usual laws of cooling, the largest and rarest masses, and those protected by the largest atmosphere envelopes, retaining their heat the longest; to have an explanation of the present high temperature of the sun, which with only $\frac{1}{4}$ of the earth's density has 300,000 times more weight, of the moderated temperature of the earth's surface, of the ice-bound condition of the surface of the moon, which with a greater density than the earth has, only $\frac{1}{40}$ of its weight, and hardly any appreciable atmosphere, and of the apparently fluid condition of the

* It is a popular belief in some parts of Great Britain that falling stars have been found in a gelatinous form upon the earth's surface; and from professor SILLIMAN's Journal, it would appear that the same notion is current in America; the "sparkling jelly," there described, would form a curious subject for chemical examination! From the composition of aerolites it would seem that the elementary components of the universe are the same every where, but this singular substance would appear to have no representative in our globe.

surface of Jupiter*, which with a density, and therefore a heat-conducting power, even less than those of the sun, has 300 times the earth's weight.

Popular belief, both in ancient and in modern times, has attributed a frigorific power to the rays of the moon. Modern philosophers, on the contrary, have all expected a calorific effect from the concentration of her beams; and an American journalist has recently published the alleged result of an experiment, in which an evident rising of the thermometer was occasioned by a powerful arrangement of this kind. Dr. LARDNER, in his monogram on heat, published in 1833, calculates on the supposition that the respective heating powers of the sun and moon's rays are in the ratio of their brightness; that in the experiment of DE LA HIRE, who condensed the lunar rays 300 times by a 3-feet burning glass, the heating effect could not have been so much as $\frac{1}{20}$ of a degree. Sir JOHN HERSCHEL, in his work (which I have not seen) on Astronomy, also published last year, gives the following imaginary description of the lunar climate:

"The moon has no clouds, nor any other indications of an atmosphere; hence its climate must be very extraordinary: the alternation being that of unmitigated and burning sunshine, fiercer than an equatorial noon, continued for a whole fortnight, and the keenest severity of frost, far exceeding that of our polar winters, for an equal time. Such a disposition of things must produce a constant transfer of whatever moisture may exist on its surface, from the point beneath the sun to that opposite, by distillation *in vacuo*, after the manner of the little instrument called a cryophorus. The consequence must be absolute aridity below the vertical sun, constant accretion of hoar frost in the opposite region, and, perhaps, a narrow zone of running water at the borders of the enlightened hemisphere. It is possible then, that evaporation on the one hand, and condensation on the other, may to a certain extent preserve an equilibrium of temperature, and mitigate the extreme severity of both climates."

In this instance, popular prejudice, though also overshooting the mark, has probably erred less than philosophical hypothesis. There is no sufficient reason for believing that the moon's temperature ever was higher than that of the earth at the same time; and on the supposition that at some very distant period they were equal, it must follow from the *greater comparatively* surface of the moon, from her greater density and heat-conducting probable power, and still more, from her almost total want of *an atmosphere*, that her temperature on the surface is very greatly inferior to that of any portion of the earth; whence, under any circumstances, the earth must constantly *give out heat to the moon*, which will, therefore, with effect, appreciable or not, according to the power and sensibility of the instruments employed, act upon the thermometer like the mass of ice used by the Florentine Academicians, which gave rise to so many speculations upon the possibility of a *radiation of cold*. It is probable that the temperature of the moon's surface does not exceed that of the etherial space which immediately surrounds it; and, from the considerations above detailed, especially the moon's smaller *mass*, that this falls short of the temperature determined by FOURIER as belonging to the etherial space immediately beyond the earth's atmosphere.

* The physical condition of Jupiter's surface, his ever-varying belts, all disposed in parallelism with his equator, and the occasional more permanent spots like the summits of icebergs floating in a liquid medium, would perhaps be best explained by the hypothesis of this planet still being in a state of partial fusion. His moons may be at a lower temperature, and now inhabited.

The telescopic appearance of the moon, the snowy covering of her Phlegræn continents, and the silent ruggedness of her frozen seas, might suffice to disprove the existence of a temperature upon her surface equal or similar to that of the earth. In what respect, it may be asked, differs the aspect of the bright portion of the moon's disc from that which would be assumed by a portion of the Himalaya mountains viewed at the distance of the moon, when winter has clothed both eminence and valley in a uniform robe of snow, and bound in icy chains every stream and expanse of water? In that elevated region of the earth there is a partial, in the moon there is nearly a total, want of that atmospheric envelope, which, like a garment, enables those bodies which receive it to retain the solar warmth. The moon's rays will no more heat a warmer thermometer than will the concentrated light given out by a snowy range of terrestrial mountains. This refrigeration appears to have extended through a great thickness of the moon's external crust, for her volcanoes are nearly extinct: the flames which they give out were barely visible even through Sir W. HERSCHEL's powerful telescopes.

Still less compatible with their snowy whiteness, and with the bold precipices and overhanging character of the lunar Alps, is Sir JOHN HERSCHEL's idea of a monthly revolution of the climate on the moon's surface. Not only would the *linea terminator* or boundary of light and darkness be followed during the moon's increase by a bright line of melting snow, while the enlightened face generally would present a scene of overwhelming deluges, breaking down the edges of its numerons elevated cavities, and reducing the moon's surface to a near resemblance to that of the earth; but the irresistible expansive force of the ice, monthly freeziug in the fissures and cavities of its mountains, would in the course of a few years reduce these to a much smaller altitude than those which are now left upon the earth.

It is probable indeed, that the causes of the striking differences between the lunar and terrestial surfaces may be referred solely to the smaller bulk and rarer atmosphere of the moon. An attentive examination of the most ancient craters of volcanoes now active, such as Vesuvius, will shew, that the first stage of a violent eruption must have been the blowing into the air an inverted conical mass of the mountain, two, three, or four miles in diameter, leaving a crater of similar dimensions, such as may yet be traced of Vesuvius, where Monte Somma forms the eastern edge of the ancient crater, upwards of four miles distant from the western, with the modern cone and crater rising between them, like the central elevations, which are to be seen in the circular hollows of the moon. From the smaller force of gravity at the moon's surface, the masses displaced by those explosions have greatly exceeded the size of any craters that can now be traced upon the earth, many of the lunar cavities being from twenty to fifty miles in diameter and a mile or two in depth. A rapid refrigeration appears to have followed the active era of the lunar volcanoes, so that the whole of them remain visible and unaltered by falls of rain or by alternate frosts and thaws, (while the operation of these causes upon the earth's surface has left barely traceable vestiges of whole volcanic regions;) and, during the short period of her being a habitable world, her atmosphere must have consisted chiefly of watery vapour.

If would appear, from the known laws of the communication of heat by radiation, that the created nniverse is constantly suffering a loss of that principle, which can be supplied only by successive exertions of the creating power. Hence the decay and loss of old stars, and the appearance of new ones recorded in the annals of astronomy.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of May, 1834.

Days of the Month.	Barometer reduced to 32° Fahr. At 4½ A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	Thermometer in the Air. Minimum at 4½ A.M.	At 10 A.M.	Max. by Reg. Ther.	At 4 P.M.	At 10 P.M.	Depression of Moist-bulb Thermometer. At 4½ A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	Hair Hygrometer. At 10 A.M.	At 4 P.M.	Rain. Inches.	Wind. Morning.	Noon.	Evening.	Weather. Morning.	Noon.	Evening.
1	,797	,848	,726	,773	80,5	88,2	111,0	91,0	83,0	2,0	6,0	8,3	9.8	94,0	91		S. E.	N. W.	S.	clear.	clear stm.	clear.
2	,700	,764	,580	,750	82,0	87,2	100,1	92,1	84,0	3,8	6,8	9,4	7,0	95,0	90		s. e.	s. e.	s.	do	cloudy.	do
3	,630	,678	,537	,712	82,0	89,0	100,0	92,7	85,2	3,5	5,8	10,0	5,1	94,0	86		s. e.	S.	s. e.	do	clear.	cloudy.
4	,666	,746	,643	,760	82,0	89,5	96,1	92,6	85,0	3,0	8,0	9,4	5,0	92,0	88		s. e.	S.	S.	do	do	clds. light.
5	,708	,782	,688	,775	81,5	89,4	94,5	93,2	84,0	2,7	7,3	11,3	5,2	92,0	86		s. e.	S.	S.	do	do	clear.
6	,745	,794	,674	,732	80,1	90,1	96,1	94,1	84,4	1,9	7,4	10,7	4,4	91,0	85		s.	S.	S.	do	do	lightning.
7	,697	,740	,575	,643	82,2	90,4	97,3	95,7	83,6	3,1	7,2	11,5	4,1	91,0	83		S.	s.	s. e.	do	do	clear.
8	,619	,668	,544	,669	81,1	90,2	98,0	95,6	84,4	3,7	9,2	12,7	4,3	88,0	81		S.	S.	S.	do	do	do
9	,645	,742	,620	,204	81,2	90,8	97,1	95,5	81,0	2,6	8,0	11,7	8,8	88,0	83		S.	S.	s. e.	do	do	rain.
10	,758	,654	,690	,783	80,2	87,5	96,1	93,6	83,8	6,9	9,9	12,6	4,0	86,0	81		n. e.	E.	s. e.	do	cumst.	clear.
11	,738	,770	,618	,677	81,2	89,3	103,0	92,5	86,3	3,7	8,3	11,0	9,3	87,0	83	0.03	o	n.	s.	do	clear.	do
12	,657	,696	,530	,637	81,2	90,0	98,2	94,3	86,0	9,4	10,8	14,3	8,7	83,0	76		n	var.	s.	do	do	do
13	,602	,612	,480	,538	82,0	90,3	98,0	93,5	85,0	3,8	8,9	14,0	9,2	86,0	75		s.	o.	o.	do	do	do
14	,502	,514	,448	,543	82,5	91,5	102,4	95,3	89,4	7,5	11,5	15,3	12,0	84,0	74		e.	var.	s. w.	do	do	do
15	,532	,548	,435	,534	86,0	92,3	103,0	97,3	88,9	4,0	7,7	13,6	6,7	88,0	79		s.	s.	s. e.	do	do	ha. st. rn.
16	,510	,547	,448	,497	79,0	88,1	95,0	98,9	85,0	4,0	8,9	14,8	4,9	90,0	83	0.40	s. e.	s. e.	s. e.	do	misty,	cum. cir.
17	,456	,532	,418	,523	81,1	91,5	99,5	95,2	87,0	1,1	6,9	10,9	4,6	93,0	85	0.02	e.	o.	s.	storm.	clear.	do
18	,485	,545	,445	,542	85,2	93,1	102,0	95,0	88,2	2,8	7,9	10,8	4,7	90,0	86		e.	s.	s, e.	cloudy.	cumuli.	do
19	,535	,575	,443	,538	84,0	92,7	101,0	95,9	88,4	5,9	7,7	11,9	6,1	91,0	83		o.	s. e.	s.	do	cumuli.	clear.
20	,504	,502	,389	,502	85,4	93,3	101,1	96,4	89,2	3,6	8,6	11,7	7,8	90,0	82		e.	o.	s e.	clear.	do	do
21	,453	,508	,412	,506	85,4	92,7	101,0	96,7	87,1	3,3	10,7	12,1	13,7	89,0	82		e.	o.	s.	do	haze.	dry. n. wr.
22	,471	,500	,400	,480	86,6	93,5	101,4	98,6	81,0	4,6	8,1	12,4	9,7	91,0	82		o.	o.	e.	haze.	do	do
23	,461	,500	,394	,523	86,4	94,2	96,7	96,0	79.4	7,2	9,9	10,0	2,2	88,0	87		o.	o. n. e.	e.	threatning.	do	storm. rn.
24	,450	,525	,420	,519	79,0	89,0	88,7	88,3	85,2	0,8	6,8	5,6	3,6	92,0	94	2.60	o.	n.	o.	cum. st.	rain.	cloudy.
25	,474	,528	,440	,535	81,0	86,3	92,2	90,5	84,3	2,0	5,1	3,7	2,1	94,0	97	0.66	o.	s. w.	e.	rain.	clds. rain,	do
26	,455	,522	,456	,524	86,0	91,8	94,0	91,8	87,4	2,6	9,8	4,8	3,1	89,0	91		s.	var.	s'	cus. strat.	cloudy.	dull.
27	,478	,530	,428	,478	87,2	89,7	95,0	94,4	87,2	4,2	4,7	8,4	3,7	96,0	91		S.	s. w.	s. e.	overcast.	do	haze.
28	,463	,550	,406	,468	86,1	90,9	98,2	95,1	87,2	2,4	5,2	8,0	3,4	93,0	89		S.	s. w.	S.	hazy.	cumuli.	do
29	,432	,520	,500	,533	86,2	92,6	106,1	97,0	90,0	2,2	6,6	12,5	5,3	91,0	78		S.	S.	s. e.	cum. strat.	clear.	clear.
30	,503	,537	,463	,515	86,0	93,2	112,0	97,5	90,2	3,3	7,9	15,0	7,6	88,0	75	0.01	s. e.	S.	s. e.	clear.	shower.	rn. cloudy.
31	,472	,508	,392	,487	88,0	92,8	106.0	96,4	90,0	6,0	7,1	10,1	4,4	91,0	84		s. e.	S.	s. e.	strong wind.	hazy.	hazy.
Mean,	,543	,619	,504	,597	83,1	90,7	99,4	94,6	86,0	3,7	7,9	10,9	6,1	90,0	84,4	37.2	monsoon.			unusually oppressive weather.		

The instruments for 10 A. M. and 4 P. M. are suspended in the free air of the Laboratory, those for 5 A. M. and 10 P. M. in the south veranda of a third story near the cathedral. The register thermometer for extremes is also in the same veranda.