THE
POPULAR EDITION.

ASIATIC RESEARCHES;

OR,

TRANSACTIONS

OF THE

SOCIETY,

INSTITUTED IN BENGAL,

FOR INQUIRING INTO THE

HISTORY AND ANTIQUITIES, THE ARTS, SCIENCES,
AND LITERATURE,

OF

ASIA.

VOLUME THE FIRST.

PUBLISHED BY BROJENDRO LALL DOSS,
No. 8 PUTTULDANGAH STREET.

CALCUTTA:
PRINTED BY AUBHOY CHURN BOSE,
AT THE RAJASTHAN PRESS,
No. 134 AMHERST STREET.
1884.

CONTENTS OF THE FIRST VOLUME.

THE INTRODUCTION.

IF this first publication of the ASIATIC SOCIETY should not answer those expectations, which may have been hastily formed by the learned in *Europe*, they will be candid enough to consider the disadvantages, which must naturally have attended its institution and retarded its progress: a mere man of letters, retired from the world and allotting his whole time to philosophical or literary pursuits, is a character unknown among *Europeans* resident in *India*, where every individual is a man of business in the civil or military state, and constantly occupied either in the affairs of government, in the administration of justice, in some department of revenue or commerce, or in one of the liberal professions; very few hours, therefore, in the day or night can be reserved for any study, that has no immediate connection with business, even by those who are most habituated to mental application; and it is impossible to preserve health in *Bengal* without regular exercise and seasonable relaxation of mind; not to insist, that, in the opinion of an illustrious *Roman*, "No one can be said to enjoy liberty, who "has not sometimes the privilege of doing nothing." All employments, however, in all countries, afford some intervals of leisure; and there is an active spirit in *European* minds, which no climate or situation in life can wholly repress, which justifies the ancient notion, that *a change of toil is a species of repose*, and which seems to consider nothing done or learned, while any thing remains unperformed or unknown: several *Englishmen*, therefore, who resided in a country, every part of which abounds in objects of curious and useful speculation, concurred in opinion, that a Society instituted at *Calcutta*, on the plan of those established in the principal cities of *Europe*, might possibly be the means of concentrating all the valuable knowledge, which might occasionally be attained in

Asia, or of preserving at least many little tracts and essays, the writers of which might not think them of sufficient importance for separate publication. The ASIATIC SOCIETY was accordingly formed on the 15th of *January* 1784, by those Gentlemen, whose names are distinguished by asterisks in the list of Members at the end of this book; and ample materials have already been collected for two large volumes on a variety of new and interesting subjects. By this publication the institution may be considered as having taken root; but the plant will flourish or fade, according as the activity or remissness of the Members and their correspondents shall promote or obstruct its growth: 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 President or the Secretary at *Calcutta*; it will languish, if such communications shall be long intermitted; and it will die away, if they shall entirely cease; for it is morally impossible, that a few men, whatever be their zeal, who have great public duties to discharge, and difficult private studies connected with those duties, can support such an establishment without the most assiduous and eager auxiliaries.

Before we proceed to give a short history of the institution, it may be proper to declare, that the Society will pass no decision in their *collective* capacity on any point of literature or philosophy, but that the writers of such dissertations, as they shall think worthy to be published from time to time, must hold themselves individually responsible for their own opinions; a declaration, which is conformable, we believe, to the practice of similar Societies in *Europe*.

It having been resolved to follow, as nearly as possible, the plan of the Royal Society at *London*, of which the *King* is *Patron*, it was agreed at the first regular meeting, that the following Letter should be sent to the Governor-General and Council, as the *Executive Power* in the Company's territories; and their answer, which is also subjoined, was received in the course of the next month.

To the Honorable WARREN HASTINGS, ESQ.

Governor-General, President;

EDWARD WHELER, JOHN MACPHERSON,

and JOHN STABLES, ESQUIRES,

Members of the Council of Fort William *in* Bengal.

HONORABLE SIR AND GENTLEMEN,

A SOCIETY, of which we are Members, having been instituted for the purpose of inquiring into the History Civil and Natural, the Antiquities, Arts, Sciences, and Literature of *Asia*, we are desirous, that you will honor us with accepting the title of our *Patrons*, and request you to consider this application as a token of the great respect, with which we are,

HONORABLE SIR AND GENTLEMEN,

Your most obedient and most humble Servants,

JOHN HYDE,
WILLIAM JONES,
JOHN CARNAC,
DAVID ANDERSON,
WILLIAM CHAMBERS,
FRANCIS GLADWIN,
JONATHAN DUNCAN,
THOMAS LAW,
CHARLES WILKINS,
JOHN DAVID PATERSON,
CHARLES CHAPMAN,
CHARLES HAMILTON,
GEORGE HILARO BARLOW.

Calcutta, January 22, 1784.

THE ANSWER.

GENTLEMEN,

WE very much approve and applaud your endeavours to promote the extension of knowledge by the means, which your local advantages afford you in a degree, perhaps, exceeding those of any part of the *Globe ;* and we derive great hopes of your attainment of so important an end from our personal knowledge of the abilities and talents of the Gentlemen, whose names we read in the subscription to your address.

We accept the title you have been desirous of conferring upon us of *Patrons* to your Society, and shall be happy to avail ourselves of any occasion that may occur of contributing to its success.

We are, GENTLEMEN,

Your most obedient humble Servants,

WARREN HASTINGS,
EDWARD WHELER,
JOHN MACPHERSON,
JOHN STABLES.

MR. HASTINGS *therefore appeared, as Governor-General, among the Patrons of the new Society ; but he seemed, in his private station, as the first liberal promoter of useful knowledge in* Bengal, *and especially as the great encourager of* Persian *and* Sanskrit *literature, to deserve a particular mark of distinction ; and he was accordingly requested in a short letter to accept the title of* President: *it was, indeed, much doubted, whether he would accept any office, the duties of which he could not have leisure to fulfil ; but an offer of the honorary title was intended as a tribute of respect, which the occasion seemed to demand, and which could not have been omitted without an appearance of inattention to his distinguished merit. His answer is also annexed.*

GENTLEMEN,

I AM highly sensible of the honor, which you have been pleased to confer upon me, in nominating me to be the President of your Society, and I hope you will both admit and approve the motives, which impel me to decline it.

From an early conviction of the utility of the institution, it was my anxious wish that I might be, by whatever means, instrumental in promoting the success of it ; but not in the mode which you have proposed, which, I fear, would rather prove, if of any effect, an incumbrance on it.

I have not the leisure requisite to discharge the functions of such a station ; nor, if I did possess it, would it be consistent with the pride, which every man may be allowed to avow in the pursuit or support of the objects of his personal credit, to accept the first station in a department, in which the superior talents of my immediate followers in it would shine with a lustre, from which mine must suffer much in the comparison, and to stand in so conspicuous a point of view the only ineffective member of a body, which is yet in its infancy, and composed of Members with whose abilities I am, and have long been, in the habits of intimate communication, and know them to be all eminently qualified to fill their respective parts in it.

On these grounds I request your permission to decline the offer which you have done me the honor to make to me, and to yield my pretensions to the Gentleman, whose genius planned the institution, and is most capable of conducting it to the attainment of the great and splendid purposes of its formation.

I at the same time earnestly solicit your acceptance of services in any way in which they can be, and I hope that they may be, rendered useful to your Researches.

I have the honor to be,
GENTLEMEN,
Your most obedient and most humble Servant,

FORT WILLIAM, *January* 30, 1784. WARREN HASTINGS.

On the receipt of this letter, SIR WILLIAM JONES *was nominated President of the Society; and, at their next meeting, he delivered the following Discourse.*

A
DISCOURSE
ON THE
INSTITUTION OF A SOCIETY,
FOR INQUIRING INTO THE
HISTORY, CIVIL AND NATURAL,
THE ANTIQUITIES, ARTS, SCIENCES AND LITERATURE,
OF
ASIA.

BY THE PRESIDENT.

GENTLEMEN,

WHEN I was at sea, last August, on my voyage to this country, which I had long and ardently desired to visit, I found, one evening, on inspecting the observations of the day, that *India* lay before us, and *Persia* on our left, whilst a breeze from *Arabia* blew nearly on our stern. A situation so pleasing in itself, and to me so new, could not fail to awaken a train of reflections in a mind, which had early been accustomed to contemplate with delight the eventful histories and agreeable fictions of this eastern world. It gave me inexpressible pleasure to find myself in the midst of so noble an amphitheatre, almost encircled by the vast regions of *Asia*, which has ever been esteemed the nurse of sciences, the inventress of delightful and useful arts, the scene of glorious actions, fertile in the productions of human genius, abounding in natural wonders, and infinitely diversified in the forms of religion and government, in the laws, manners, customs, and languages, as well as in the features and complexions, of men. I could not help remarking, how important and extensive a field was yet unexplored, and how many solid advantages unimproved; and, when I considered with pain, that, in this fluctuating, imperfect, and limited condition of life, such inquiries and improvements could only be made by the united efforts of many, who are not easily brought, without some pressing inducement or strong impulse, to converge in a common point, I consoled myself with a hope founded on opinions, which it might have the appearance of flattery to mention, that, if in any country or community such an union could be effected, it was among my countrymen in *Bengal*, with some of whom I already had, and with most was desirous of having, the pleasure of being intimately acquainted.

You have realized that hope, gentlemen, and even anticipated a declaration of my wishes, by your alacrity in laying the foundation of a society for inquiring into the history and antiquities, the natural productions, arts, sciences, and literature of *Asia*. I may confidently foretell, that an institution so likely to afford entertainment, and convey knowledge, to mankind, will advance to maturity by slow, yet certain, degrees; as the Royal Society, which at first was only a meeting of a few literary friends at *Oxford*, rose gradually to that splendid zenith, at which a HALLEY was their secretary, and a NEWTON their president.

Although it is my humble opinion, that, in order to ensure our success and permanence, we must keep a middle course between a languid remissness, and an over zealous activity, and that the tree, which you have auspiciously planted, will produce fairer blossoms and more exquisite fruit, if it be not at first exposed to too great a glare of sunshine, yet I take the liberty of submitting to your consideration a few general ideas on the plan of our society; assuring you, that, whether you reject or approve them, your correction will give me both pleasure and instruction, as your flattering attentions have already conferred on me the highest honor.

It is your design, I conceive, to take an ample space for your learned investigations, bounding them only by the geographical limits of *Asia;* so that, considering *Hindustan* as a centre, and turning your eyes in idea to the North, you have, on your right, many important kingdoms in the Eastern peninsula, the ancient and wonderful empire of *China* with all her *Tartarian* dependencies, and that of *Japan*, with the cluster of precious islands, in which many singular curiosities have too long been concealed: before you lies that prodigious chain of mountains, which formerly perhaps were a barrier against the violence of the sea, and beyond them

the very interesting country of *Tibet*, and the vast regions of *Tartary*, from which, as from the *Trojan* horse of the poets, have issued so many consummate warriors, whose domain has extended at least from the banks of the *Ilissus* to the mouths of the *Ganges:* on your left are the beautiful and celebrated provinces of *Iran* or *Persia*, the unmeasured and perhaps unmeasurable deserts of *Arabia*, and the once flourishing kingdom of *Yemen*, with the pleasant isles that the *Arabs* have subdued or colonized; and farther westward, the *Asiatic* dominions of the *Turkish* sultans, whose moon seems approaching rapidly to its wane.—By this great circumference the field of your useful researches will be inclosed; but, since *Egypt* had unquestionably an old connection with this country, if not with *China*, since the language and literature of the *Abyssinians* bear a manifest affinity to those of *Asia*, since the *Arabian* arms prevailed along the *African* coast of the *Mediterranean*, and even erected a powerful dynasty on the continent of *Europe*, you may not be displeased occasionally to follow the streams of *Asiatic* learning a little beyond its natural boundary; and, if it be necessary or convenient, that a short name or epithet be given to our society, in order to distinguish it in the world, that of *Asiatic* appears both classical and proper, whether we consider the place or the object of the institution, and preferable to *Oriental*, which is in truth a word merely relative, and though commonly used in *Europe*, conveys no very distinct idea.

If now it be asked, what are the intended objects of our inquiries within these spacious limits, we answer, M A N and N A T U R E; whatever is performed by the one, or produced by the other. Human knowledge has been elegantly analysed according to the three great faculties of the mind, *memory*, *reason*, and *imagination*, which we constantly find employed in arranging and retaining, comparing and distinguishing, combining and diversifying, the ideas, which we receive through our senses, or acquire by reflection; hence the three main branches of learning are *history*, *science*, and *art:* the first comprehends either an account of natural productions, or the genuine records of empires and states; the second embraces the whole circle of pure and mixed mathematics, together with ethics and law, as far as they depend on the reasoning faculty; and the third includes all the beauties of imagery, and the charms of invention, displayed in modulated language, or represented by color, figure, or sound.

Agreeably to this analysis, you will investigate whatever is rare in the stupendous fabric of nature, will correct the geography of *Asia* by new observations and discoveries; will trace the annals, and even traditions, of those nations, who from time to time have peopled or desolated it; and will bring to light their various forms of government, with their institutions civil and religious; you will examine their improvements and methods in arithmetic and geometry, in trigonometry, mensuration, mechanics, optics, astronomy, and general physics; their systems of morality, grammar, rhetoric, and dialectic; their skill in chirurgery and medicine, and their advancement, whatever it may be, in anatomy and chemistry. To this you will add researches into their agriculture, manufactures, trade; and, whilst you inquire with pleasure into their music, architecture, painting, and poetry, will not neglect those inferior arts, by which the comforts and even elegancies of social life are supplied or improved. You may observe, that I have omitted their languages, the diversity and difficulty of which are a sad obstacle to the progress of useful knowledge; but I have ever considered languages as the mere instruments of real learning, and think them improperly confounded with learning itself: the attainment of them is, however, indispensably necessary; and if to the *Persian*, *Armenian*, *Turkish*, and *Arabic*, could be added not only the *Sanscrit*, the treasures of which we may now hope to see unlocked, but even the *Chinese*, *Tartarian*, *Japanese*, and the various insular dialects, an immense mine would then be open, in which we might labor with equal delight and advantage.

Having submitted to you these imperfect thoughts on the *limits* and *objects* of our future society, I request your permission to add a few hints on the *conduct* of it in its present immature state.

LUCIAN begins one of his satirical pieces against historians, with declaring that the only true proposition in his work was, that it should contain nothing true; and perhaps it may be advisable at first, in order to prevent any difference of sentiment on particular points not immediately before us, to establish but one rule, namely to have no rules at all. This only I mean, that, in the infancy of any society, there ought to be no confinement, no trouble, no expense, no unnecessary formality. Let us, if you please, for the present, have weekly evening meetings in this hall, for the purpose of hearing original papers read on such subjects, as fall within the circle of our inquiries. Let all curious and learned men be invited to send their tracts to our secretary, for which they ought immediately to receive our thanks; and if, towards the end of each year, we should be supplied with a sufficiency of valuable materials to fill a volume, let us present our *Asiatic* miscellany to the literary world, who have derived so much pleasure and information from the agreeable work of KÆMPFER, than which we can scarce propose a better model, that they will accept with eagerness any fresh entertainment of the same kind. You will not perhaps be disposed to admit mere translations of considerable length, except of such unpublished essays or treatises as may be transmitted to us by native authors; but, whether you will enroll as members any number of learned natives, you will hereafter decide, with many other questions as they happen to arise; and you will think, I presume, that all questions should be decided, on a ballot, by a majority of two-thirds; and that nine members should be requisite to constitute a board for such decisions. These points, however, and all others, I submit entirely, gentlemen, to your determination, having neither wish nor pretension to claim any more than my single right of suffrage. One thing only, as essential to your dignity, I recommend with earnestness, on no account to admit a new member, who has not expressed a voluntary desire to become so; and in that case, you will not require, I suppose, any other qualification than a love of knowledge and a zeal for the promotion of it.

Your institution, I am persuaded, will ripen of itself, and your meetings will be amply supplied with interesting and amusing papers, as soon as the object of your inquiries shall be generally known. There are, it may not be delicate to name them, but there are many, from whose important studies I cannot but conceive high expectations; and, as far as mere labor will avail, I sincerely promise, that if, in my allotted sphere of jurisprudence, or in any intellectual excursion, that I may have leisure to make, I should be so fortunate as to collect, by accident, either fruits or flowers, which may seem valuable or pleasing, I shall offer my humble *Nezr* to your society with as much respectful zeal as to the greatest potentate on earth.

THE SYSTEM OF INDIAN, ARABIAN AND PERSIAN LETTERS.

SOFT AND HARD BREATHINGS.

a	e	ha	hha

VOWELS DIPTHONGS AND SEMIVOWELS.

ăā	aȧ	e	è	ya
i	ì	o	ò	wa
u	ù	ai	au	ra
ri	rī	lrĭ	lrī	la
ȧȧ	ėė	i̇i̇	u̇u̇	áá

CONSONANTS.

ca	c'ha	ga	g'ha	ṅa
ka	kha		gha	
sa	sha	za	zha	śa
ťa	t'ha	'da	'd'ha	ńa
			'dha	
ta	t'ha	da	d'ha	na
	tha		dha	
pa	p'ha	ba	b'ha	ma
	fa		va	

COMPOUNDS.

cha	ch'ha	ja	jha	ṅya
ża	ża	ża	csha	jṅya

DÉVANÁGRÍ LETTERS.

अ आ इ ई उ ऊ ऋ ॠ

ऌ ॡ ए ऐ ओ औ अं अः

क का कि की कु कू कृ कॄ

कॢ कॣ के कै को कौ कं कः

क ख ग घ ङ च छ ज झ ञ

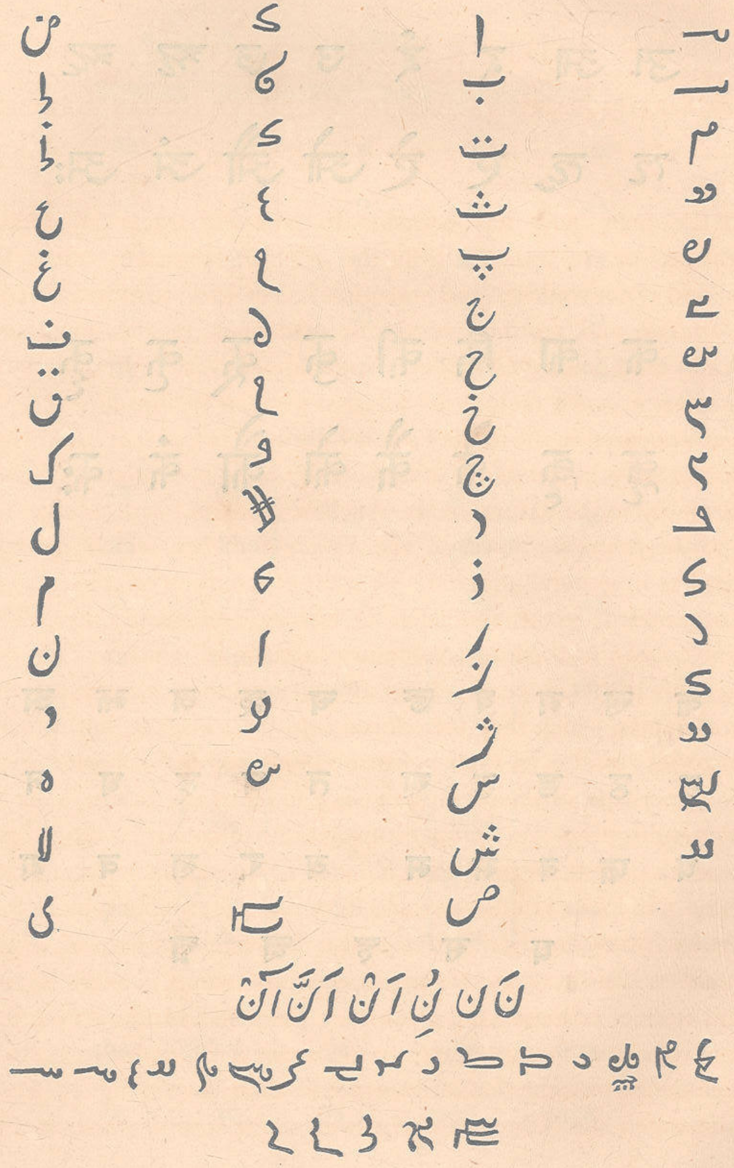
ट ठ ड ढ ण त थ द ध न

प फ ब भ म य र ल व श

ष स ह क्ष ज्ञ

Vol. I. Plate 3.

PERSIAN LETTERS.



TRANSACTIONS
OF THE
ASIATIC SOCIETY.

I.

A DISSERTATION

On the ORTHOGRAPHY *of* ASIATIC WORDS *in* ROMAN LETTERS.

BY THE PRESIDENT.

EVERY man, who has occasion to compose tracts on *Asiatic* Literature, or to translate from the *Asiatic* languages, must always find it convenient, and sometimes necessary, to express *Arabian*, *Indian*, and *Persian* words, or sentences, in the characters generally used among *Europeans;* and almost every writer in those circumstances has a method of notation peculiar to himself: but none has yet appeared in the form of a complete system; so that each original sound may be rendered invariably by one appropriated symbol, conformably to the natural order of articulation, and with a due regard to the primitive power of the *Roman* alphabet, which modern *Europe* has in general adopted. A want of attention to this object has occasioned great confusion in history and geography. The ancient *Greeks*, who made a voluntary sacrifice of truth to the delicacy of their ears, appear to have altered by design almost all the oriental names, which they introduced into their elegant, but romantic, histories; and even their more modern geographers, who were too vain, perhaps, of their own language to learn any other, have so strangely disguised the proper appellations of countries, cities, and rivers in *Asia*, that, without the guidance of the sagacious and indefatigable M. D'ANVILLE, it would have been as troublesome to follow ALEXANDER through the *Panjab* on the Ptolemaic map of AGATHODÆMON, as actually to travel over the same country in its present state of rudeness and disorder. They had an unwarrantable habit of moulding foreign names to a *Grecian* form, and giving them a resemblance to some derivative word in their own tongue: thus, they changed the *Gogra* into *Agoranis*, or *a river of the assembly*, *Uchah* into *Oxydracæ*, or *sharpsighted*, and *Renas* into *Aornos*, or *a rock inaccessible to birds;* whence their poets, who delighted in wonders, embellished their works with new images, distinguishing regions and fortresses by properties, which existed only in imagination. If we have less liveliness of fancy than the Ancients, we have more accuracy, more love of truth, and, perhaps, more solidity of judgment; and, if our works shall afford less delight to those, in respect of whom we shall be Ancients, it may be said without presumption, that we shall give them more correct information on the history and geography of this eastern world; since no man can perfectly describe a country, who is unacquainted with the language of it. The learned and entertaining work of M. D'HERBELOT, which professes to interpret and elucidate the names of persons and places, and the titles of books, abounds also in citations from the best writers of *Arabia* and *Persia;* yet, though his orthography will be found less defective than that of other writers on similar subjects, without excepting the illustrious Prince KANTEMIR, still it requires more than a moderate knowledge of *Persian*, *Arabic*, and *Turkish*, to comprehend all the passages quoted by him in *European* characters; one instance of which I cannot forbear giving. In the account of *Ibnu Zaidùn*, a celebrated *Andalusian* poet, the first couplet of an elegy in *Arabic* is praised for its elegance, and expressed thus in *Roman* letters:

Iekad heïn tenagikom dhamairna;
Iacdha âlaïna alassa laula tassina.

"The time, adds the translator, will soon come, when you will "deliver us from all our cares: the remedy is assured, provided we have "a little patience." When DR. HUNT of *Oxford*, whom I am bound to name with gratitude and veneration, together with two or three others, attempted at my request to write the same distich in *Arabian* characters, they all wrote it differently, and all, in my present opinion, erroneously. I was then a very young student, andcould not easily have procured *Ibnu Zaidùn's* works, which are, no doubt, preserved in the *Bodley* library, but which have not since fallen in my way. This admired couplet, therefore, I have never seen in the original characters, and confess myself at a loss to render them with certainty. Both verses are written by D'HERBELOT without attention to the grammatical points, that is, in a form which no learned

Arab would give them in recitation; but, although the *French* version be palpably erroneous, it is by no means easy to correct the error. If *álásà*, or a *remedy*, be the true reading, the negative particle must be absurd, since *taàssaínà* signifies *we are patient*, and not *we despair;* but, if *álásay*, or *affliction*, be the proper word, some obscurity must arise from the verb, with which it agrees. On the whole I guess, that the distich should thus be written:

يكاد حين تناجيكم ضمايرنا
يقضي علينا الاسي لولا تاسينا

Yecádu hhína tunájícum demáyerunà
Yakdì âláinà 'lásay lau là taássínà.

"When our bosoms impart their secrets to you, anguish would "almost fix our doom, if we were not mutually to console ourselves."

The principal verbs may have a future sense, and the last word may admit of a different interpretation. DR. HUNT, I remember, had found in GIGGEIUS the word *dhemáyer*, which he conceived to be in the original. After all, the rhyme seems imperfect, and the measure irregular. Now I ask, whether such perplexities could have arisen, if D'HERBELOT or his Editor had formed a regular system of expressing *Arabic* in *Roman* characters, and had apprized his readers of it in his introductory dissertation?

If a further proof be required, that such a system will be useful to the learned and essential to the student, let me remark, that a learner of *Persian*, who should read in our best histories the life of Sultan AZIM, and wish to write his name in *Arabic* letters, might express it *thirty-nine* different ways, and be wrong at last: the word should be written *Aàzem* with three points on the first consonant.

There are two general modes of exhibiting *Asiatic* words in our own letters: they are founded on principles nearly opposite, but each of them has its advantages, and each has been recommended by respectable authorities. The first professes to regard chiefly the *pronunciation* of the words intended to be expressed; and this method, as far as it can be pursued, is unquestionably useful: but new sounds are very inadequately presented to a sense not formed to receive them; and the reader must in the end be left to pronounce many letters and syllables precariously; besides, that by this mode of orthography all grammatical analogy is destroyed, simple sounds are represented by double characters, vowels of one denomination stand for those of another; and possibly with all our labor we perpetuate a provincial or inelegant pronunciation: all these objections may be made to the usual way of writing *Kummerbund*, in which neither the letters nor the true sound of them are preserved, while *Kemerbend*, or *Cemerbend*, as an ancient *Briton* would write it, clearly exhibits both the original characters and the *Persian* pronunciation of them. To set this point in a strong light, we need only suppose, that the *French* had adopted a system of letters wholly different from ours, and of which we had no types in our printing-houses: let us conceive an *Englishman* acquainted with their language to be pleased with MALHERBE'S well-known imitation of *Horace*, and desirous of quoting it in some piece of criticism. He would read thus:

'La mort a des rigueurs à nulle autre pareilles;
'On a beau la prier:
'La cruelle qu'elle est se bouche les oreilles,
'Et nous laisse crier.

'Le pauvre en sa cabane, ou le chaume le couvre,
'Est sujet a ses loix,
'Et la garde, qui veille aux barrieres du *Louvre*,
'N'en défend pas nos rois!'

Would he then express these eight verses, in *Roman* characters, exactly as the *French* themselves in fact express them, or would he decorate his composition with a passage more resembling the dialect of savages, than that of a polished nation? His pronunciation, good or bad, would, perhaps, be thus represented:

'Law more aw day reegyewrs aw nool otruh parellyuh,
'Onne aw bo law preeay:
'Law crooellyuh kellay suh booshuh lays orellyuh,
'Ay noo laysuh creeay.

'Luh povre ong saw cawbawn oo luh chomuh luh coovruh,
'Ay soozyet aw say lwaw,
'Ay law gawrduh kee velly ò bawryayruh dyoo *Loovruh*
'Nong dayfong paw nos rwaw!'

The second system of *Asiatic* Orthography consists in scrupulously rendering letter for letter, without any particular care to preserve the pronunciation; and, as long as this mode proceeds by unvaried rules, it seems clearly entitled to preference.

For the first method of writing *Persian* words the warmest advocate, among my acquaintance, was the late Major DAVY, a Member of our Society, and a man of parts, whom the world lost prematurely, at a time, when he was meditating a literary retirement, and hoping to pass the remainder of his life in domestic happiness, and in the cultivation of his very useful talents. He valued himself particularly on his pronunciation of the *Persian* language, and on his new way of exhibiting it in our characters, which he instructed the learned and amiable Editor of his *Institutes of Timour* at *Oxford* to retain with minute attention throughout his work. Where he had acquired his refined articulation of the *Persian*, I never was informed; but it is evident, that he spells most proper names in a manner, which a native of *Persia*, who could read our letters, would be unable to comprehend. For instance: that the capital of *Azarbáíjàn* is now called *Tabríz*, I know from the mouth of a person born in that city, as well as from other *Iranians;* and that it was so called sixteen hundred years ago, we all know from the Geography of *Ptolemy;* yet Major DAVY always wrote it *Tubburaze*, and insisted that it should thus be pronounced. Whether the natives of *Semerkand*, or *Samarkand*, who probably speak the dialect of *Soghd* with a *Turanian* pronunciation, call their birth-place, as DAVY spelled it, *Summurkund*, I have yet to learn; but I cannot believe it, and am convinced, that the former mode of writing the word expresses both the letters and the sound of them better than any other combination of characters. His method, therefore, has every defect; since it renders neither the original elements of words, nor the sounds represented by them in *Persia*, where alone we must seek for genuine *Persian*, as for *French* in *France*, and for *Italian* in *Italy*.

The second method has found two able supporters in MR. HALHED and MR. WILKINS; to the first of whom the public is indebted for a perspicuous and ample grammar of the *Bengal* language, and to the second for more advantages in *Indian* literature than *Europe*, or *India*, can ever sufficiently acknowledge.

MR. HALHED, having justly remarked, 'that the two greatest 'defects in the orthography of any language are the application of 'the same letter to several different sounds, and of different letters to 'the same sound,' truly pronounces them both to be 'so common in '*English*, that he was exceedingly embarrassed in the choice of letters 'to express the sound of the *Bengal* vowels, and was at last by no 'means satisfied with his own selection.' If any thing dissatisfies me, in his clear and accurate system, it is the use of *double* letters for the long vowels (which might however be justified) and the frequent intermixture of *Italic* and *Roman* letters in the same word; which both in writing and printing must be very inconvenient: perhaps it may be added, that his dipthongs are not expressed analogously to the sounds, of which they are composed.

The system of MR. WILKINS has been equally well considered, and MR. HALHED himself has indeed adopted it in his preface to the *Compilation of Hindu Laws:* it principally consists of double letters to signify our third and fifth vowels, and of the common prosodial marks to ascertain their brevity or their length; but those marks are so generally appropriated to books of prosody, that they never fail to convey an idea of metre; nor, if *either* prosodial sign were adopted, would *both* be necessary; since the omission of a long mark would evidently denote the shortness of the unmarked vowel, or conversely. On the whole, I cannot but approve this notation for *Sanscrit* words, yet require something more universally expressive of *Asiatic* letters: as it is perfect, however, in its kind, and will appear in the works of its learned inventor, I shall annex, among the examples, four distichs from the *Bhágawat* expressed both in his method and mine*: a translation of them will be produced on another occasion; but, in order to render this tract as complete as possible, a fuller specimen of *Sanscrit* will be subjoined with the original printed in the characters of *Bengal*, into which the *Bráhmans* of that province transpose all their books, few of them being able to read the *Dévanágari* letters: so far has their indolence prevailed over their piety!

* See Plate IV.

Let me now proceed, not prescribing rules for others, but explaining those which I have prescribed for myself, to unfold my own system, the convenience of which has been proved by careful observation and long experience.

It would be superfluous to discourse on the organs of speech, which have been a thousand times dissected, and as often described by musicians, or anatomists; and the several powers of which every man may perceive either by the touch or by sight, if he will attentively observe another person pronouncing the different classes of letters, or pronounce them himself distinctly before a mirror: but a short analysis of articulate sounds may be proper to introduce an examination of every separate symbol.

All things abound with error, as the old searchers for truth remarked with despondence; but it is really deplorable, that our first step from total ignorance should be into gross inaccuracy, and that we should begin our education in *England* with learning to read *the five vowels*, *two* of which, as we are taught to pronounce them, are clearly dipthongs. There are, indeed, five simple vocal sounds in our language, as in that of *Rome;* which occur in the words *an innocent bull*, though not precisely in their natural order, for we have retained the true arrangement of the letters, while we capriciously disarrange them in pronunciation; so that our eyes are satisfied, and our ears disappointed. The primary elements of articulation are the *soft* and *hard breathings*, the *spiritus lenis* and *spiritus asper* of the *Latin* grammarians. If the lips be opened ever so little, the breath suffered gently to pass through them, and the feeblest utterance attempted, a sound is formed of so simple a nature, that, when lengthened, it continues nearly the same, except that, by the least acuteness in the voice it becomes a cry, and is probably the first sound uttered by infants; but if, while this element is articulated, the breath be forced with an effort through the lips, we form an *aspirate* more or less harsh in proportion to the force exerted. When, in pronouncing the simple vowel, we open our lips wider, we express a sound completely articulated, which most nations have agreed to place the *first* in their symbolical systems: by opening them wider still with the corners of them a little drawn back, we give birth to the *second* of the *Roman* vowels, and by a large aperture, with a farther inflexion of the lips and a higher elevation of the tongue, we utter the *third* of them. By pursing up our lips in the least degree, we convert the simple element into another sound of the same nature with the *first* vowel, and easily confounded with it in a broad pronunciation: when this new sound is lengthened, it approaches very nearly to the *fourth* vowel, which we form by a bolder and stronger rotundity of the mouth; a farther contraction of it produces the *fifth* vowel, which in its elongation almost closes the lips, a small passage only being left for the breath. These are all short vowels; and, if an *Italian* were to read the words *an innocent bull*, he would give the sound of each corresponding long vowel, as in the monosyllables of his own language, *sà, si, sò, se, sù.* Between these ten vowels are numberless gradations, and nice inflexions, which use only can teach; and, by the composition of them all, might be formed an hundred dipthongs, and a thousand tripthongs; many of which are found in *Italian*, and were probably articulated by the *Greeks;* but we have only occasion, in this tract, for two dipthongs, which are compounded of the *first* vowel with the *third*, and with the *fifth*, and should be expressed by their constituent letters: as those vocal compounds which begin with the *third* and *fifth* short vowels, they are generally, and not inconveniently, rendered by distinct characters, which are improperly ranged among the consonants. The tongue, which assists in forming some of the vowels, is the principal instrument in articulating two liquid sounds, which have something of a vocal nature; one, by striking the roots of the upper teeth, while the breath passes gently through the lips; another, by an inflexion upwards with a tremulous motion; and these two liquids coalesce with such ease, that a mixed letter, used in some languages, may be formed by the first of them followed by the second: when the breath is obstructed by the pressure of the tongue, and forced between the teeth on each side of it, a liquid is formed peculiar to the *British* dialect of the *Celtic.*

We may now consider in the same order, beginning with the root of the tongue and ending with the perfect close of the lips, those less musical sounds, which require the aid of a *vowel*, or at least of the *simple breathing*, to be fully articulated; and it may here be premised, that the *harsh breathing* distinctly pronounced after each of these *consonants*, as they are named by grammarians, constitutes its proper *aspirate.*

By the assistance of the tongue and the palate are produced two congenial sounds, differing only as *hard* and *soft;* and these two may be formed still deeper in the throat, so as to imitate, with a long vowel after them, the voice of a raven; but if, while they are uttered, the breath be harshly protruded, two analogous articulations are heard, the second of which seems to characterize the pronunciation of the *Arabs;* while the nasal sound, very common among the *Persians* and *Indians*, may be considered as the *soft palatine* with part of the breath passing through the nose; which organ would by itself rather produce a *vocal* sound, common also in *Arabia*, and not unlike the cry of a young antelope and some other quadrupeds.

Next come different classes of *dentals*, and among the first of them should be placed the *sibilants*, which most nations express by an *indented* figure: each of the *dental* sounds is hard or soft, sharp or obtuse, and, by thrusting the tip of the tongue between the teeth, we form two sounds exceedingly common in *Arabic* and *English*, but changed into lisping sibilants by the *Persians* and *French*, while they on the other hand have a sound unknown to the *Arabs*, and uncommon in our language, though it occurs in some words by the composition of the hard sibilant with our last vowel pronounced as a diphthong. The liquid *nasal* follows these, being formed by the tongue and roots of the teeth, with a little assistance from the other organ; and we must particularly remember, when we attend to the pronunciation of *Indian* dialects, that most sounds of this class are varied in a singular manner by turning the tongue upwards, and almost bending it back towards the palate, so as to exclude them nearly from the order, but not from the analogy, of dentals.

The *labials* form the last series, most of which are pronounced by the appulse of the lips on each other or on the teeth, and one of them by their perfect close: the letters, by which they are denoted, represent in most alphabets the curvature of one lip or of both; and a *natural character* for all articulate sounds might easily be agreed on, if nations would agree on any thing generally beneficial, by delineating the several organs of speech in the act of articulation, and selecting from each a distinct and elegant outline. A perfect language would be that, in which every idea, capable of entering the human mind, might be neatly and emphatically expressed by one specific word; simple, if the idea were simple; complex, if complex;

and on the same principle a perfect system of letters ought to contain one specific symbol for every sound used in pronouncing the language to which they belonged: in this respect the old *Persian* or *Zend* approaches to perfection; but the *Arabian* alphabet, which all *Mohammedan* nations have inconsiderately adopted, appears to me so complete for the purpose of writing *Arabic*, that not a letter could be added or taken away without manifest inconvenience, and the same may indubitably be said of the *Dévanágarì* system; which, as it is more naturally arranged than any other, shall here be the standard of my particular observations on *Asiatic* letters. Our *English* alphabet and orthography are disgracefully and almost ridiculously imperfect; and it would be impossible to express either *Indian*, *Persian*, or *Arabian* words in *Roman* characters, as we are absurdly taught to pronounce them; but a mixture of new characters would be inconvenient, and by the help of the diacritical marks used by the *French*, with a few of those adopted in our own treatises on *fluxions*, we may apply our present alphabet so happily to the notation of all *Asiatic* languages, as to equal the *Dévanágarì* itself in precision and clearness, and so regularly that any one, who knew the original letters, might rapidly and unerringly transpose into them all the proper names, appellatives, or cited passages, occurring in tracts of *Asiatic* literature.

অ

This is the simplest element of articulation, or first *vocal* sound, concerning which enough has been said: the word *America* begins and ends with it; and its proper symbol therefore is A; though it may be often very conveniently expressed by E, for reasons, which I shall presently offer. In our own anomalous language we commonly mark this elementary sound by our *fifth* vowel, but sometimes express it by a strange variety both of vowels and diphthongs; as in the phrase, *a mother bird flutters over her young;* an irregularity, which no regard to the derivation of words or to blind custom can in any degree justify. The *Nágarì* letter is called *Acàr*, but is pronounced in *Bengal* like our *fourth* short vowel, and in the *west* of *India*, like our *first:* in all the dialects properly *Indian* it is considered as *inherent* in every consonant; and is placed last in the system of the *Tibetians*, because the letters, which include it, are

first explained in their schools. If our double consonants were invariably connected, as in *Sanscrit*, it would certainly be the better way to omit the simple element, except when it begins a word. This letter answers to the *fat-hhah*, or *open* sound of the *Arabs*, and, in some few words, to the *Zeber* of the *Persians*, or an acute accent placed *above* the letter; but this *Arabian* mark, which was supplied in the *Pahlavi* by a distinct character, is more frequently pronounced at *Isfahan* either like our *first* or our *second* short vowel, as in *chashm* and *ferzend*, and the distinction seems to depend, in general, on the nature of the consonant, which follows it. Two of our letters, therefore, are necessary for the complete notation of the *acàr* and *zeber;* and thus we may be able occasionally to avoid ridiculous or offensive equivocations in writing Oriental words, and to preserve the true pronunciation of the *Persians*, which differs as widely from that of the *Muslimans* in *India*, as the language of our Court at *St. James's* differs from that of the rustics in the *Gentle Shepherd.*

আ

When the *first* vowel, as the *Persians* pronounce it in the word *bakht*, is doubled or prolonged, as in *bákht*, it has the sound of the second *Nágarì* vowel, and of the first *Arabic* letter, that is, of our long vowel in *cast;* but the *Arabs* deride the *Persians* for their broad pronunciation of this letter, which in *Iràn* has always the sound of our vowel in *call*, and is often so prolated, as to resemble the *fourth* and even the *fifth* of our long vowels. Its natural mark would be the short A *doubled;* but an *acute* accent in the middle of words, or a *grave* at the end of them, will be equally clear, and conformable to the practice of polished nations on the continent of *Europe*. The very broad sound of the *Arabian* letter, which they call *extended*, and which the *Persians* extend yet more, as in the word *ásàn*, may aptly enough be represented by the prosodial sign, since it is constantly long; whereas the mark *hamzah* as constantly *shortens* the letter, and gives it the sound of the point above or below it; as in the words *ósúl* and *Islàm:* the changes of this letter may perplex the learner, but his perplexity will soon vanish, as he advances. In writing *Asiatic* names, we frequently confound the broad *à* with its correspondent short vowel, which we improperly express by an O; thus we write *Cossim* for *Kásim*, in defiance of analogy and correctness. Our vowel in *fond* occurs but seldom, if ever, in *Arabian*, *Indian*, or *Persian* words: it is placed, nevertheless, in the general system with the short prosodial mark, and stands at the head of the vowels, because it is in truth only a variation of the simple breathing.

ই

Our *third* vowel, correctly pronounced, appears next in the *Nágarì* system; for our *second* short vowel has no place in it. This vocal sound is represented in *Arabic* by an acute accent *under* the letter; which at *Mecca* has almost invariably the same pronunciation; but, since, in the *Zend*, a character like the *Greek E-psilon* represents both our *second* and *third* short vowels, the *Persians* often pronounce *zìr* like *zeber*, calling this country *Hend*, and the natives of it *Hendùs*: nevertheless it will be proper to denote the *Sanscrit icàr* and the *Arabian casr* by one unaltered symbol; as in the words *Indra* and *Imám*.

ঈ

The *third* vowel produced or lengthened is, for the reason before suggested, best marked by an accent either acute or grave, as in *Italian*:

Se cerca, se dice:
L'amico dov'è?
L'amico infelice,
Rispondi, morì!
Ah! no; sì gran duolo
Non darle per me.
Rispondi, ma solo:
Piangendo partì.

It was once my practice to represent this long vowel by two marks, as in the words *Lebeid* and *Deiwàn*, to denote the *point* in *Arabic* as well as the letter above it; but my present opinion is, that *Lebìd* and *Díwàn* are more conformable to analogy, and to the *Italian* orthography, which, of all *European* systems, approaches nearest to perfection.

উ

This is our *fifth* vowel; for our *fourth* short one is, like our *second*, rejected from the pure pronunciation of the *Sanscrit* in the west of *India* and at *Bánáras*, though the *Bengalese* retain it in the first *Nágarì* letter, which they call *ocàr*: to the notation of this sound, our vowel in *full* and the *Persian* in *gul* should be constantly appropriated, since it is a simple articulation, and cannot without impropriety be represented by a double letter. It answers to *hupsilon*, and, like that, is often confounded with *iota*: thus *mushc* has the sound of *mishc* among the modern *Persians*, as *Numpha* was pronounced *Nympha* by the *Romans*. The *damm* of the *Arabs* is, however, frequently sounded, especially in *Persia*, like our short O in *memory*, and the choice of two marks for a variable sound is not improper in itself, and will sometimes be found very convenient.

ঊ

The same lengthened, and properly expressed by an accent, as in the word *virtù*: it is a very long vowel in *Persian*, so as nearly to treble the quantity of its correspondent short one; and this, indeed, may be observed of all the long vowels in the genuine *Isfaháni* pronunciation; but the letter *váù* is often redundant, so as not to alter the sound of the short vowel preceding it; as in *khósh* and *khód*: it may, nevertheless, be right to express that letter by an accent.

ঋ

A vocal sound peculiar to the *Sanscrit* language: it is formed by a gentle vibration of the tongue preceding our *third* vowel pronounced *very short*, and may be well expressed by the prosodial mark, as in *Rĭshi*, a Saint. When it is connected with a consonant, as in *Crĭshna*, no part of it is used but the curve at the bottom. We have a similar sound in the word *merrily*, the second syllable of which is much shorter than the first syllable of *riches*.

ৠ

The same complex sound considerably lengthened; and, therefore, distinguishable by the prosodial sign of a *long* vowel.

ঌ

In *Bengal*, where the *ra* is often sunk in the pronunciation of compound syllables, this letter expresses both syllables of our word *lily:* but its genuine sound, I believe, is *lrĭ*, a short triphthong peculiar to the *Sanscrit* language.

ৡ

Whatever be the true pronunciation of the former symbol, this is only an elongation of it, and may, therefore, be distinguished by the metrical sign of a long vowel.

এ

Our *second* long vowel, best represented, like the others, by an accent, as in *Véda*, the sacred book of the *Hindus*, which is a derivative from the *Sanscrit* root *vid*, to *know*. The notation, which I recommend, will have this important advantage, that learned foreigners in *Europe* will in general pronounce the oriental words, expressed by it, with as much correctness and facility as our own nation.

ঐ

This is a diphthong, composed of our *first* and *third* vowels, and expressible, therefore, by them, as in the word *Vaidya*, derived from *Véda*, and meaning *a man of the medical cast:* in *Bengal* it is pronounced as the *Greek* diphthong in *poimèn*, a shepherd, was probably sounded in ancient *Greece*. The *Arabs* and the *English* articulate this composition exactly alike, though we are pleased to express it by a simple letter, which, on the continent of *Europe*, has its genuine sound. In the mouth of an *Italian* the constituent vowels in the words *mai* and *miei* do not perfectly coalesce, and, at the close of a verse, they are separated; but a *Frenchman* and a *Persian* would pronounce them nearly like the preceding long vowel; as in the word *Mai*, which at *Paris* means our month of the same name, and at *Isfahan* signifies *wine:* the *Persian* word, indeed, might with great propriety be written *mei*, as the diphthong seems rather to be composed of our *second* and *third* short vowels; a composition very common in *Italian* poetry.

ও

Though a coalition of *acàr* and *ucàr* forms this sound in *Sanscrit*, as in the mystical word *óm;* yet it is in fact a simple articulation, and the *fourth* of our long vowels.

ঔ

Here, indeed, we meet with a proper diphthong, compounded of our *first* and *fifth* vowels; and in *Persia* the constituent sounds are not perfectly united; as in the word *Firdausi*, which an *Italian* would pronounce exactly like a native of *Isfahan*. Perhaps, in *Arabic* words, it may be proper to represent by an accent the letters *yà* and *wáw*, which, preceded by the *open* vowel, form the respective diphthongs in *Zohaìr* and *Jaúheri;* but the omission of this accent would occasion little inconvenience.

অং

This is no vowel, but an abbreviation, at the end of a syllable, of the *nasal* consonants: thus the *Portuguese* write *Siaó* for *Siam* with a nasal termination; and the accurate M. D'ANVILLE expresses great unwillingness to write *Siam* for the country, and *Siamois* for the people of it, yet acknowledges his fear of innovating, 'notwithstanding his attachment to the original and proper denominations of 'countries and places.' It appears to me, that the addition of a distinct letter *ga* would be an improper and inconvenient mode of expressing the nasal sound, and that we cannot do better than adopt the *Indian* method of distinguishing it, in *Sanscrit*, *Chinese*, and *Persian* words, by a point above the letter; as in *Sińha*, a lion; *Cáńhì*, the name of an illustrious Emperor; and *Sámán*, a household.

অঃ

This too is an abbreviation or substitute, at the close of a syllable, for the *strong aspirate*, and may be distinguished in the middle of a word by a hyphen, as in *duh-c'ha*, pain, though it seems often to resemble the *Arabian hà*, which gives only a more forcible sound to the vowel, which precedes it, as in *hhicmah*, science. It is well known, that, when such *Arabic* words are used in construction, the *final* aspirate of the first noun has the sound of *tà;* but, as the letter remains unaltered, it should, I think, be preserved in our characters, and expressed either by two *points* above it, as in *Arabic*, or by an accentual mark; since if we write *Zubdahu'lmulc*, or, *the Flower of the Realm*, with a comma to denote the suppression of the *álif*, every learner will know, that the first word should be pronounced *Zubdat*. The *hà* is often omitted by us, when we write *Persian* in

English letters, but ought invariably to be inserted, as in *Sháh-námah;* since the aspiration is very perceptibly sounded in the true pronunciation of *dergáh*, *rúbáh*, and other similar words. The *Sanscrit* character before us has the singular property of being interchangeable, by certain rules, both with *ra* and *sa;* in the same manner as the *Sylva* of the *Romans* was formed from the *Æolic* word *hylva*, and as *arbos* was used in old *Latin* for *arbor*.

ক

We come now to the first proper consonant of the *Indian* system, in which a series of letters, formed in the throat near the root of the tongue, properly takes the lead. This letter has the sound of our *k* and *c* in the words *king* and *cannibal;* but there will be great convenience in expressing it uniformly by the *second* of those marks, whatever be the vowel following it. The *Arabs*, and perhaps all nations descended from SEM, have a remarkable letter sounded near the palate with a hard pressure, not unlike the cawing of a raven, as in the word *Kásim;* and for this particular sound the redundance of our own alphabet supplies us with an useful symbol: the common people in *Hhejàz* and *Egypt* confound it, indeed, with the first letter of *Gabr*, and the *Persians* only add to that letter the hard palatine sound of the *Arabian kàf;* but, if we distinguish it invariably by *k*, we shall find the utility of appropriating our *c* to the notation of the *Indian* letter now before us. The third letter of the *Roman alphabet* was probably articulated like the *kappa* of the *Greeks;* and we may fairly suppose, that *Cicero* and *Cithera* were pronounced alike at *Rome* and at *Athens:* the *Welsh* apply this letter uniformly to the same sound, as in *cae* and *cefn;* and a little practice will render such words as *citàb* and *cinnara* familiar to our eyes.

খ

We hear much of aspirated letters; but the only proper *aspirates* (those, I mean, in which a strong breathing is distinctly heard after the consonants) are to be found in the languages of *India;* unless the word *cachexy*, which our medical writers have borrowed from the *Greek*, be thought an exception to the rule. This aspiration may be distinguished by a *comma*, as the letter

before us is expressed in the word *c'hanitra*, a *spade*. The *Arabian*, *Persian*, and *Tuscan* aspirate, which is formed by a harsh protrusion of the breath, while the consonant is roughly articulated near the root of the tongue, may be written as in the word *makhzen*, a *treasury*.

গ

Whatever vowel follow this letter, it should constantly be expressed as in the words *gul*, a *flower*, and *gil*, *clay;* and we may observe, as before, that a little use will reconcile us to this deviation from our irregular system. The *Germans*, whose pronunciation appears to be more consistent than our own, would scarce understand the *Latin* name of their own country, if an *Englishm*[illegible] to pronounce it as he was taught at school.

ঘ

The proper aspirate of the last letter, as in the word *Rag'hu-vansa:* the *Persians* and *Arabs* pronounce their *ghain* with a bur in the throat, and a tremulous motion of the tongue, which gives it a sound resembling that of *r*, as it is pronounced in *Northumberland;* but it is in truth a compound guttural, though frequently expressed by a simple letter, as in *Gaza*, which should be written *Ghazzah*, a city of *Palestine;* and in *gazelle*, as the *French* naturalists call the *ghazàl*, or antelope, of the *Arabians*. The *Persian* word *mígh*, a cloud, is *még'ha* in *Sanscrit;* as *mísh*, a sheep, appears also to be derived from *mésha*, by that change of the long vowels, which generally distinguishes the *Iranian* from the *Indian* pronunciation.

ঙ

This is the *nasal* palatine, which I have already proposed to denote by a *point* above the letter *n;* since the addition of a *g* would create confusion, and often suggest the idea of a different syllable. Thus ends the first series of *Nágarì* letters, consisting of the *hard* and *soft* guttural, each attended by its proper aspirate, and followed by a *nasal* of the same class; which elegant arrangement is continued, as far as possible, through the *Sanscrit* system, and seems conformable to the beautiful analogy of nature.

চ

The next is a series of *compound* letters, as most grammarians consider them, though some hold them to be simple sounds articulated near the palate. The first of them has no distinct sign in our own alphabet, but is expressed, as in the word *China*, by two letters, which are certainly not its component principles: it might, perhaps, be more properly denoted, as it is in the great work of M. D'HERBELOT, by *tsh;* but the inconvenience of retaining our own symbol will be less than that of introducing a new combination, or inventing, after the example of DR. FRANKLIN, a new character. *China* is a *Sanscrit* word; and it will be convenient so to write it, though I feel an inclination to express it otherwise.

ছ

The same composition with a strong breathing articulated after it. Harsh as it may seem, we cannot, if we continue the former symbol, avoid expressing this sound, as in the word *ch'handas*, metre.

জ

This too seems to have been considered by the *Hindus* as a simple palatine, but appears, in truth, to be the complex expression of *dzh.* Perhaps the same letter may, by a small difference of articulation, partake of two different sounds. This, at least, we may observe, that the letter under consideration is confounded, as a simple sound, with *ya;* and, as a compound, with *za*, one of its constituents: thus the *yásmìn* of *Arabia* is by us called *jasmin;* while the same man is *Giorgi* at *Rome* and *Zorzi* at *Venice;* or, (to give an example of both in a single word) *yug*, or *junction*, at *Bánáres*, is *jug* in *Bengal;* and was pronounced *zug*, or, in the nominative, *zugon*, at *Athens.* We should, however, invariably express the letter before us by *ja.*

The *Arabian* letters *dhàl'*, *'dàd*, and *d'hà*, are all pronounced in *Persia* like *za*, with a sort of lisp, from an attempt to give them their genuine sound: they may be well expressed, as in fluxionary characters, by a series of points above them, ż, z̈, z⃛.

ঝ

The preceding letter aspirated, as in the word *J'hasha*, a fish.

ঞ

This is the *second* nasal, composed of the former and the letter *ya.* As the *Italian* word *agnello* and our *onion* contain a composition of *n* and *y*, they should regularly be written *anyello* and *onyon;* and the *Indian* sound differs only in the greater nasality of the first letter, which may be distinguished, as before, by a *point.* A very useful *Sanscrit* root, signifying *to know*, begins with the letter *ja*, followed by this compound *nasal*, and should be written *jṅya;* whence *jṅyána*, knowledge: but this harsh combination is in *Bengal* softened into *gyà:* it is expressed by a distinct character, which stands last in the plate annexed.*

ট

In the curious work entitled *Toh'fahu'l Hind*, or *The Present of* INDIA, this is the *fourth* series of *Sanscrit* letters; but, in general, it has the *third* rank, more agreeably, I think, to the analogy of the system. This class is pronounced with an inflexion of the tongue towards the roof of the mouth, which gives an obtuse sound to the consonant, and may be distinguished by an accent above it. The first is the INDIAN *ťa*, as in the word *cóťara*, a rotten tree, and is commonly expressed in *Persian* writings by *four* points, but would be better marked by the ARABIAN *ťà*, which it very nearly resembles.

ঠ

The same with a strong breathing after it, as in *Vaicunťha*, or *unwearied*, an epithet of *Vishnu.*

ড

A remarkable letter, which the *Muslimans* call the INDIAN *dàl;* and express, also, by four points over it: but it should, by analogy to the others, be distinguished by an accentual mark, as in the word *dańda*, punishment. When the tongue is inverted with a slight vibratory motion, this letter has a mixture of the *ra*, with which it is often, but incorrectly, confounded; as in the common word *bera* for *béda*, great. It resembles the ARABIAN *'dád.*

ঢ

The preceding letter aspirated, as in *D'hácà*, improperly pronounced *Dacca.* In the same manner may be written the *Arabian*

* See Plate II.

'dhá, but without the comma, since its aspirate is less distinctly heard than in the *Indian* sound.

ণ

This is the *nasal* of the third series, and formed by a similar inversion of the tongue. In *Sanscrit* words it usually follows the letters *ra* and *sha*, (as in *Bráhmeńa*, derived from *Brahman'*, the Supreme Being; *Vishńu*, a name of his *preserving* power): or precedes the other letters of the third class.

ত

Here begins the *fourth* series, on which we have little more to remark. The first letter of this class is the common *ta*, or *hard* dental, if it may not rather be considered as a *lingual*.

থ

Its aspirate, which ought to be written with a comma, as in the word *Aswatt'ha*, the *Indian* fig-tree, lest it be confounded by our countrymen with the *Arabian* sound in *thurayyà*, the *Pleiads*, which is precisely the *English* aspiration in *think;* a sound, which the *Persians* and *French* cannot easily articulate: in *Persian* it should be expressed by *s* with a point above it.

দ

The *soft* dental in *Dévatà*, or *Deity*.

ধ

The same aspirated, as in *D'herma*, justice, virtue, or piety. We must also distinguish this letter by a comma from the *Arabian* in *dhahab*, gold; a sound of difficult articulation in *France* and *Persia*, which we write *thus* very improperly, instead of retaining the genuine *Anglo-Saxon* letter, or expressing it, as we might with great convenience, *dhus*.

ন

The simple *nasal*, sounded by the teeth with a little assistance from the nostrils, but not so much as in many *French* and *Persian*

words. Both this *nasal* and the former occur in the name *Nárdyeńa*, or *dwelling in water*.

প

Next come the *labials* in the same order; and first the hard labial *pa*, formed by a strong compression of the lips; which so ill suits the configuration of an *Arabian* mouth, that it cannot be articulated by an *Arab* without much effort.

ফ

The proper aspirate of *pa*, as in the word *shepherd*, but often pronounced like our *fa*, as in *fela*, instead of *p'hela*, fruit. In truth, the *fa* is a distinct letter; and our *pha*, which in *English* is redundant, should be appropriated to the notation of this *Indian* labial.

ব

The *soft* labial in *Budd'ha*, wise, and the second letter in most alphabets used by *Europeans;* which begin with a vowel, a labial, a palatine, and a lingual. It ought ever to be distinguished in *Nágarì* by a transverse bar, though the copyists often omit this useful distinction.

ভ

The *Indian* aspirate of the preceding letter, as in the word *bháshá*, or a *spoken* dialect. No comma is necessary in this notation, since the sound of *bha* cannot be confounded with any in our own language.

ম

This is the last nasal, as in *Menu*, one of the first created beings according to the *Indians:* it is formed by closing the lips entirely, whilst the breath passes gently through the nose. And here ends the regular arrangement of the *Nágarì* letters. Another series might have been added, namely, *sa*, *sha*, *za*, *zha*, which are in the same proportion as *ta*, *tha*, *da*, *dha*, and the rest; but the two last sounds are not used in *Sanscrit*.

য

Then follows a set of letters approaching to the nature of vowels: the first of them seems in truth to be no more than our *third* short vowel, beginning a diphthong, and may, therefore, be thought a superfluous character. Since this union, however, produces a kind of consonant articulated near the palate, it is ranked by many among the consonants, and often confounded with *ja:* hence *Yamunà*, a sacred river in *India*, called also the *Daughter of the Sun*, is written *Jomanes* by the *Greeks*, and *Jumnà*, less properly, by the *English.*

র

The two liquids *na* and *ma*, one of which is a lingual and the other a labial, are kept apart, in order to preserve the analogy of the system; and the other two are introduced between the two semi-vowels: the first of these is *ra*, as in RA'MA, the conqueror of *Sílàn.*

ল

The second is *la*, in *Lanca*, another name of that island both in *Tibut*, and in *India.* A defect in the organs of the common *Bengalese* often causes a confusion between these two liquids, and even the sound of *na* is frequently substituted for the letter before us.

ব

When this character corresponds, as it sometimes does in *Sanscrit*, with our *wa*, it is, in fact, our *fifth short* vowel preceding another in forming a diphthong, and might easily be spared in our system of letters; but, when it has the sound of *va*, it is a labial, formed by striking the lower lip against the upper teeth, and might thus be arranged in a series of proportionals, *pa, fa, ba, va.* It cannot easily be pronounced in this manner by the inhabitants of *Bengal*, and some other provinces, who confound it with *ba*, from which it ought carefully to be distinguished; since we cannot conceive, that, in so perfect a system as the *Sanscrit*, there could ever have been two symbols for the same sound. In fact, the *Montes Parveti* of our ancient geographers were so named from *Parveta*, not *Parbeta*, a mountain. The *wáw* of the *Arabs* is always a vowel, either separate or coalescing with another in the form of a diphthong; but in *Persian* words it is a consonant, and pronounced like our *va*, though with rather less force.

শ

Then follow three *sibilants*, the first of which is often, very inaccurately confounded with the second, and even with the third; it belongs to that class of consonants which, in the notation here proposed, are expressed by acute accents above them, to denote an inversion of the tongue towards the palate, whence this letter is called in *India* the *palatine sa.* It occurs in a great number of words, and should be written as in *paláśa*, the name of a sacred tree with a very brilliant flower. In the same manner may be noted the *śàd* of the *Arabs* and *Hebrews*, which last it resembles in shape, and probably resembled in sound; except that in *Caśmír*, and the provinces bordering on *Persia*, it is hardly distinguishable from the following letter.

ষ

The *second* is improperly written *sha* in our *English* system, and *cha*, still more erroneously, in that of the *French;* but the form generally known may be retained, to avoid the inconvenience of too great a change even from wrong to right. This letter, of which *sa* and *ha* are not the component parts, is formed so far back in the head, that the *Indians* call it a *cerebral:* either it was not articulated by the *Greeks*, or they chose to express it by their *Xi;* since of the *Persian* word *Ardashìr* they have formed *Artaxerxes.*

স

The dental *sa*, which resembles the *Hebrew* letter of the same sound, and, like that, is often mistaken by ignorant copyists for the *ma.*

হ

The strong breathing *ha*, but rather misplaced in the *Nágarì* system; since it is the second element of articulate sounds. The *very* hard breathing of the *Arabs* may be well expressed by doubling the mark of aspiration, as in *Muhhammed*, or by an accent above it, in the manner of the long vowels, as in *Aḣmed.*

ক্ষ

The *Indian* system of letters closes with a compound of *ca* and *sha*, as in the word *paricshà*, ordeal: it is analogous to our *x*, a superfluous character, of no use, that I know of, except in algebra. The

Bengalese give it the sound of *cya*, or of our *k* in such words as *kind* and *sky;* but we may conclude, that the other pronunciation is very ancient, since the old *Persians* appear to have borrowed their word *Racshah* from the *Racsha*, or *demon* of the *Hindus*, which is written with the letter before us. The *Greeks* rendered this letter by their *Khi*, changing *Dacshin*, or the south, into *Dakhin*.

All the sounds used in *Sanscrit, Arabic, Persian*, and *Hindì*, are arranged systematically in the table prefixed to this dissertation*; and the singular letter of the *Arabs*, which they call *ȃin*, is placed immediately before the consonants. It might have been classed, as the modern *Jews* pronounce it, among the strong *nasals* of the *Indians;* but, in *Arabia* and *Persia*, it has a very different sound, of which no verbal description can give an idea, and may not improperly be called a *nasal vowel:* it is uniformly distinguished by a *circumflex* either above a short vowel, or over the letter preceding a long one, as *ȋlm*, learning; *ȃálim*, learned.

Agreeably to the preceding analysis of letters, if I were to adopt a new mode of *English* orthography, I should write ADDISON'S description of the angel in the following manner, distinguishing the *simple breathing*, or first element, which we cannot invariably omit, by a perpendicular line above our first or second vowel:

Sò hwen sm énjel, bai divain cămánd,
Widh raisiṅ tempests shécs a gilti land,
Sch az ăv lét ór pél Britanya pást,
Cálm and sirín hi draivz dhi fyúryas blást,
And, plíz'd dh'ālmaitiz ārderz tu perfórm,
Raids in dhi hwerlwind and dairects dhi stārm.

This mode of writing poetry would be the touchstone of bad rhymes, which the eye as well as the ear would instantly detect; as in the first couplet of this description, and even in the last, according to the common pronunciation of the word *perform.* I close this paper with specimens of oriental writing, not as fixed standards of orthography, which no individual has a right to settle, but as examples of the method, which I recommend; and, in order to relieve the dryness of the subject, I annex translations of all but the first specimen, which I reserve for another occasion.

---

* See Plate I.

श्रीभगवानुवाच ।

अहमेवासमेवाग्रे नान्यद्यत् सदसत् परम्
पश्चादहं यदेतच्च योवशिष्येत सोस्म्यहम्

ऋतेर्थं यत् प्रतीयेत न प्रतीयेत चात्मनि
तद्विद्यादात्मनो मायां यथा भासो यथा तमः

यथा महांति भूतानि भूतेषूच्चावचेष्वनु
प्रविष्टान्यप्रविष्टानि तथा तेषु न तेष्वहं

एतावदेव जिज्ञास्यम् तत्त्वजिज्ञासुनात्मनः
अन्वयव्यतिरेकाभ्यां यत् स्यात् सर्व्वत्र सर्व्वदा

I.

Four Distichs from the SRI'BHA'GAWAT.*

MR. WILKINS'S Orthography.

ăhămēvāsămēvāgrē nānyădyăt sădăsăt părăm
păschādahăm yădētăchchă yōvăsĕĕshyētă sōsmyăhăm

rĕĕtērthăm yăt prătēēyētă nă prătēēyētă chātmănĕĕ
tădvĕĕdyādātmănō māyām yăthā bhāsō yăthā tămăh

yăthā măhāntĕĕ bhōōtānĕĕ bhōōtēshōōchchāvăchēshwănŏŏ
prăvĕĕshtānyăprăvĕĕshtānĕĕ tăthā tēshŏŏ nă tēshwăhăm

ētāvădēvă jĕĕjnāsyăm tăttwăjĕĕjnāsŏŏnātmănăh
ănwăyăvyătĕĕrēkābhyām yăt syāt sărvătră sărvădā.

This wonderful passage I should express in the following manner:

ahamévásamévágrè nányadyat sadasat param
paśchádaham yadétachcha yóvaśishyéta sósmyaham

rĭtért'ham yat pratíyéta na pratíyéta chátmani
tadvidyádátmanó máyám yat'hà bhásó yat'hà tamah

yat'hà mahánti bhútáni bhútéshúchchávàchéshwanu
pravisht́ányapravisht́áni tat'hà téshu na téshwaham

étávadéva jijńyásyam tattwajijńyásunátmanah
anwayavyatirécábhyám yat syát servatra servadà.

---

* See page 25. The Letters are in Plate 2.

II.

MO'HA MUDGARA.

The title of this fine piece properly signifies, *The Mallet of Delusion* or *Folly*, but may be translated, *A Remedy for Distraction of Mind:* it is composed in regular anapæstic verses according to the strictest rules of *Greek* prosody, but in rhymed couplets, two of which here form a *ślóca*.

মূঢ় জহীহি ধনাগমতৃষ্ণাং   কুরু তনুবুদ্ধিমনঃসু বিতৃষ্ণাং ।
যল্লভসে নিজকর্ম্মোপাত্তং   বিত্তং তেন বিনোদয় চিত্তং ॥

কা তব কান্তা কস্তে পুত্রঃ   সংসারোয়মতীব বিচিত্রঃ ।
কস্যত্বং বা কুত আয়াত   স্তত্ত্বং চিন্তয় তদিদং ভ্রাতঃ ॥

মা কুরু ধনজনযৌবনগর্ব্বং   হরতি নিমেষাৎ কালঃ সর্ব্বং ।
মায়াময়মিদমখিলং হিত্বা   ব্রহ্মপদং প্রবিশাশু বিদিত্বা ॥

নলিনীদলগতজলবত্তরলং   তদ্বজ্জীবনমতিশয় চপলং ।
ক্ষণমিহ সজ্জনসঙ্গতিরেকা   ভবতি ভবার্ণবতরণে নৌকা ॥

যাবজ্জননং তাবন্মরণং   তাবজ্জননীজঠরে শয়নং ॥
ইতি সংসারে স্ফুটতরদোষঃ   কথমিহ মানব তব সন্তোষঃ ॥

দিনযামিন্যৌ সায়ম্প্রাতঃ   শিশিরবসন্তৌ পুনরায়াতঃ ।
কালঃ ক্রীড়তি গচ্ছত্যায়ু   স্তদপি ন মুঞ্চত্যাশাবায়ুঃ ॥

অঙ্গং গলিতং পলিতং মুণ্ডং   দন্তবিহীনং জাতং তুণ্ডং ।
করধৃত কম্পিত শোভিত দণ্ডং   তদপি ন মুঞ্চত্যাশাভাণ্ডং ॥

সুরবরমন্দির তরুতলবাসঃ   শয্যাভূতলমজিনং বাসঃ ।
সর্ব্বপরিগ্রহ ভোগত্যাগঃ   কস্য সুখং ন করোতি বিরাগঃ ॥

শত্রৌ মিত্রে পুত্রে বন্ধৌ   মাকুরু যত্নং বিগ্রহসন্ধৌ ।
ভবসমচিত্তঃ সর্ব্বত্রত্বং   বাঞ্ছস্যচিরাদ্যদি বিষ্ণুত্বং ॥

অষ্টকুলাচল সপ্তসমুদ্রাঃ ব্রহ্মপুরন্দরদিনকররুদ্রাঃ ।
নত্বং নাহং নায়ং লোক স্তদপি কিমর্থং ক্রিয়তে শোকঃ ॥

ত্বয়ি ময়ি চান্যত্রৈকোবিষ্ণুঃ ব্যর্থং কুপ্যসি ময্যসহিষ্ণুঃ ।
সর্ব্বং পশ্যাত্মন্যাত্মানং সর্ব্বত্রোৎসৃজ ভেদজ্ঞানং ॥

বালস্তাবৎ ক্রীড়াসক্ত স্তরুণস্তাবত্তরুণীরক্তঃ ।
বৃদ্ধস্তাবচ্চিন্তামগ্নঃ পরমে ব্রহ্মণি কোপি ন লগ্নঃ ॥

দ্বাদশ পজ্ঝটিকাভিরশেষঃ শিষ্যাণাং কথিতোভ্যুপদেশঃ ।
যেষাং নৈষ করোতি বিবেকং তেষাং কঃ কুরুতামতিরেকং ॥

múd́ha jahíhi dhanágamatrĭshńám
curu tenubuddhimanahsu vitrĭshnám
yallabhasè nijacarmópáttam
vittam téna vinódaya chittam.

cá tava cáńtà castè putrah
sańsáróyamatíva vichittrah
casyatwam và cutà áyáta
stattwam chintaya tadidam bhrátah.

má curu dhanajanayauvanagarvam
harati niméshát calah sarvam
máyámayamidamac'hilam hitwà
brehmapadam previśáśu viditwà.

nalinídalagatajalavattaralam
tadvajjívanamatiśaya chapalam
cshenamiha sajjanasańgatirécà
bhawati bhawárnavataranè naucà.

yávajjananam távanmarańam
távajjananìjat́harè śayanam
iti sańsárè sp'hut́ataradóshah
cat'hamiha mánava tava sańtóshah.

dinayáminyau sáyamprátah
śiśiravasantau punaráyátah
cálah críd́ati gach'hatyáyu
stadapi na muńchatyáśáváyuh.

angam galitam palitam muńd́am
dantavihińam játam tuńd́am
caradhrĭta campita śóbhita dańd́am
tadapi na muńchatyáśabhánd́am.

suravaramańdira tarutalavásah
śayyàbhútalamajinam vásah
servaparigraha bhógatyágah
casya suc'ham na caróti virágah.

śatrau mitrè putrè bańdhau
mácuru yatnam vigrahasańdhau
bhavasamachittah servatratwam
váńch'hasyachirádyadi vishnutwam.

asht́aculáchala septasamúdráh
brehmapurańdaradinacararudráh
natwam náham náyam lóca
stadapi cimart'ham criyatè śócah.

twayi mayi chányatraicòvishnuh
vyart'ham cupyasi mayyasahishnuh
servam paśyátmanyátmánam
servatrótsrija bhédajńyánam.

válastávat críd́áśacta
starúnastávattarúnìractah
vriddhastávachchintámagnah
peremé brahmańi cópi na lagnah.

dwádaśa pajj'hat́icábhiraśéshah
śishyánam cat'hitóbhyupadéśah
yésham naisha caróti vivécam
téshàm cah curutámatirécam.

A verbal Translation.

1. Restrain, deluded *mortal*, thy thirst of acquiring wealth; excite an aversion *from it* in *thy* body, understanding, and inclination: with the riches which thou acquirest by thy own actions, with these gratify thy soul.

2. Who *is* thy wife; who thy son; how extremely wonderful is even this world; whose *creature* thou also *art;* whence thou camest—meditate on this, O brother, *and again* on this.

3. Make no boast of opulence, attendants, youth; all *these* time snatches away in the twinkling of an eye: checking all this illusion like *Máyà*, set thy heart on the foot of BRAHME, speedily gaining knowledge of Him.

4. As a drop of water moves tremulous on the lotos-leaf, thus *is* human life inexpressibly slippery: the company of the virtuous *endures* here but for a moment; that is our ship in passing the ocean of the world.

5. The body *is* tottering; the head, grey; the mouth, toothless: the delicate staff trembles in the hand which holds it: still the flaggon of covetousness remains unemptied.

6. How soon *are we* born! how soon dead! how long lying in the mother's womb! how great is the prevalence of vice in this world! Wherefore, O man, hast thou complacency here below?

7. Day and night, evening and morning, winter and spring, depart and return: time sports, life passes on; yet the wind of expectation continues unrestrained.

8. To dwell under the mansion of the high Gods at the foot of a tree, to have the ground for a couch, and a hide for vesture; to renounce all extrinsic enjoyments; whom doth not such devotion fill with delight?

9. Place not thy affections too strongly on foe or friend, on

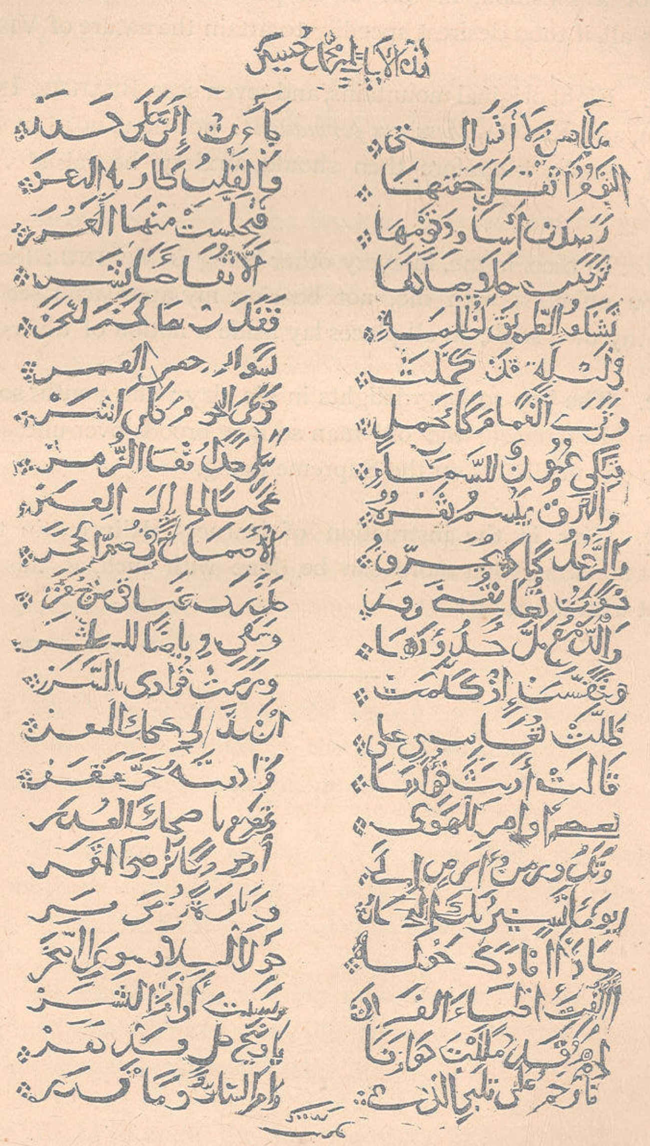
a son or a kinsman, in war or in peace: be thou even-minded towards all, if thou desirest speedily to attain the nature of VISHNU.

10. Eight original mountains, and seven seas, BRAHME, INDRA, the Sun, and RUDRA, *these are permanent:* not thou, not I, not this or that people, wherefore then should anxiety be raised *in our minds?*

11. In thee, in me, in every other being *is* VISHNU; foolishly art thou offended with me, not bearing my approach: see every soul in thy own soul; in all places lay aside a notion of diversity.

12. The boy so long delights in his play; the youth so long pursues his damsel; the old man so long broods over uneasiness; that no one meditates on the Supreme Being.

13. This is the instruction of learners delivered in twelve distinct stanzas; what more can be done with such, as this work fills not with devotion?



III.

The following Elegy, which is chosen as a specimen of *Arabic**, was composed by a learned Philosopher and Scholar, Mír Muhammed Husain, before his journey to *Haidarábàd* with Richard Johnson, Esq.

má ánsa lá ánsa állatí
jáat ílayya âlaí hadhar
álnaúmu áthkala jafnahá
waálkalbu tára bihi áldhaâr

raśadat ásáwida kaúmihá
fatakhallasat minhá álgharar
nazaât khalákhílán lehá
állá tufájíhá bishar

teshcú álťaríka li'dhulmahiń
fakadat bihá najma álsahhar
fí laílahiń kad cahhalat
bisawádihá jafna álkamar

wa teraí álghamáma caájmuliń
terâi álnujúma âlaí áshar
tebcí ûyúnoń lilsemái
âlaí ḣadáyikihá álzuhar

waálberku yebsimu thegruhu
âjabáń lihátíca álghiyar
waálrâdu cáda yukharriku
áláśmákha fí śummi álḣajar

fahawat tuâánikuní wakad
ḣadharat înákí min khafar
waáldemû bella khudúdahá
wasakaí riya'dáń lilna'dhar

wateneffasat i'dh callamat
waramat fuwádí biálsherar
'dhallat tuâátibuneí âlaí
án jedda lí âzmu álsafar

kálat ádhabta fuwádaná
waádhaktahu h́erra álsakar
taâśí áwámera lilhawaı
watut́íûu náśih́aca álghudar

watedúru min ár'din ílaí
ár'díń wamá ter'dái álmekarr
yaúmán tesíru bica álbihháru
watárah́ań turmaí bibarr

má dhá áfádaca jaúlahoń
h́aúla álbiládi siwaí ál'dajar
aálifta á'dhbáa álfelá
wanesíta áráma álbasher

ám kad melelta jiwáraná
yá wáih́a khillìn kad nafar
fárh́em âlaí kalbí álladhí
ráma álsuluwwa wamá kadar.

The Translation.

1. Never, oh! never shall I forget the fair one who came to my *tent* with timid circumspection:

2. Sleep sat heavy on her eye-lids, and her heart fluttered with fear.

3. She had marked the dragons of her tribe, (the *sentinels,*) and had dismissed all dread of danger from them:

4. She had laid aside the rings, which used to grace her ankles; lest the sound of them should expose her to calamity:

5. She deplored the darkness of the way, which hid from her the morning-star.

6. It was a night, when the eye-lashes of the moon were tinged with the black powder *(Alcohol)* of the gloom;

7. *A night*, in which thou mightest have seen the clouds, like camels, eagerly grazing on the stars;

8. While the eyes of heaven wept on the bright borders of the sky;

9. The lightning displayed his shining teeth, with wonder at this change *in the firmament;*

10. And the thunder almost burst the ears of the deafened rocks.

11. She was desirous of embracing me, but, through modesty, declined my embrace.

12. Tears bedewed her cheeks, and, to my eyes, watered a bower of roses.

13. When she spake, her panting sighs blew flames into my heart.

14. She continued expostulating with me on my excessive desire of travel.

15. 'Thou hast melted my heart, she said, and made it feel 'inexpressible anguish.

16. 'Thou art perverse in thy conduct to her who loves thee, 'and obsequious to thy guileful adviser.

17. 'Thou goest round from country to country, and art never 'pleased with a fixed residence.

18. 'One while the seas roll with thee; and, another while, 'thou art agitated on the shore.

19. 'What fruit, but painful fatigue, can arise from rambling 'over foreign regions?

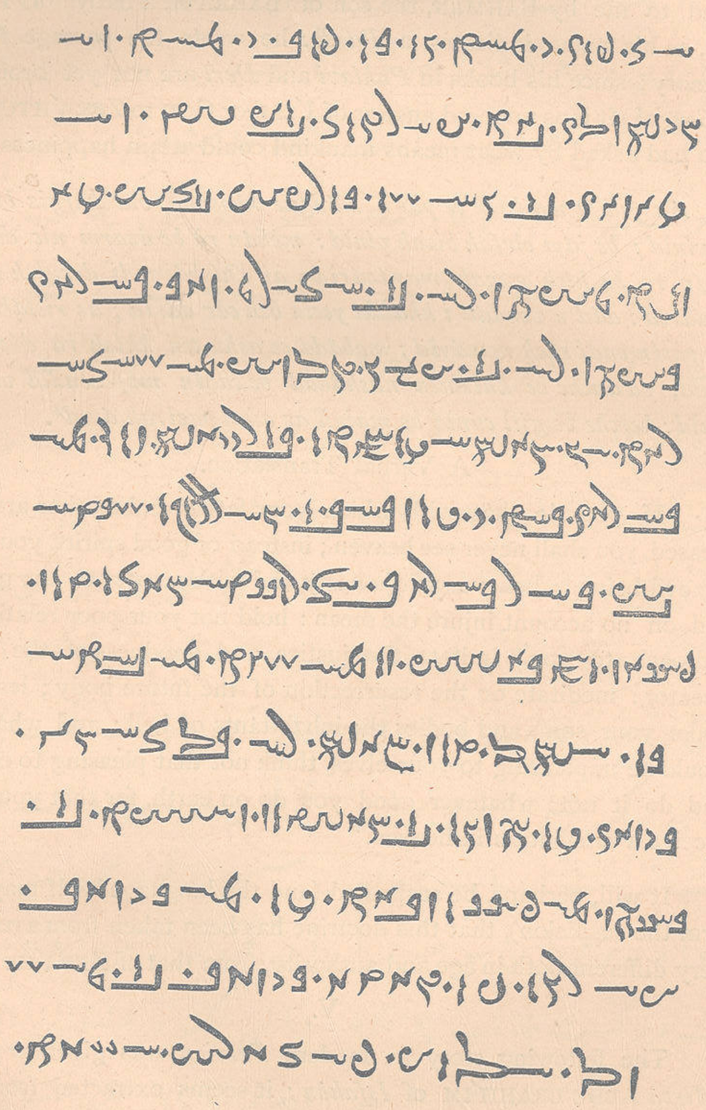
20. 'Hast thou associated thyself with the wild antelopes of 'the desert, and forgotten the tame deer?

21. 'Art thou weary then of our neighbourhood? O woe to 'him who flees from his beloved!

22. 'Have pity at length on my afflicted heart, which seeks 'relief, and cannot obtain it.'

Each couplet of the original consists of two *Dimeter Iambics*, and must be read in the proper cadence.


هو العزیز
حاجت ما از تو بر آید تمام
دامنت از کف نگذاریم ما
کار محمد غوث
۱۲۰۰



IV.

As a specimen of the old *Persian* language and character, I subjoin a very curious passage from the *Zend*, which was communicated to me by BAHMAN, the son of BAHRA'M, a native of *Yezd*, and, as his name indicates, a *Pársì*: he wrote the passage from memory; since his books in *Pahlavi* and *Derì* are not yet brought to *Bengal*. It is as upposed answer of I'ZAD or GOD to ZERA'HTUSHT, who had asked by what means mankind could attain happiness.

*Az pid u mád che ce pid u mád ne khosnúd bìd hargiz bihist ne vínìd; be jáyi cirfah bizah vínìd: mehán rà be ázarm nic dárìd, cehán rà be hìch gúnah mayázárìd: aj khìshávendi dervísh nang medárìd: dád u vendád i kháliki yectà beh càr dárìd; az ristákhí zi ten pasín endí sheh nemáyìd; mabádá ce ashù ten khísh rà dúzakhí cunìd, va ánche be khíshten nasháhad be casán mapasendìd va ma cunìd: herche be gitì cunìd be mainù az aúeh pazírah áyed**.

A Verbal Translation.

"If you do that with which your father and mother are not pleased, you shall never see heaven; instead of good spirits, you shall see evil beings: behave with honesty and with respect to the great; and on no account injure the mean: hold not your poor relations a reproach to you: imitate the justice and goodness of the Only Creator: meditate on the resurrection of the future body; lest you make your souls and bodies the inhabitants of hell; and whatever would be unpleasing to yourselves, think not that pleasing to others, and do it not: whatever good you do on earth, for that you shall receive a retribution in heaven."

It will, perhaps, be suspected (and the language itself may confirm the suspicion), that this doctrine has been taken from a religion very different both in age and authority, from that of ZERA'HTUSHT.

V.

The following story in modern *Persian* was given to me by *Mirzà* ABDU'LRAHH'IM of *Isfahàn*; it seems extracted from one of the many poems on the loves of MEJNU'N and LAILI', the ROMEO and JULIET of the East. Each verse consists of a *Cretic* foot followed by two *Choriambi*, or a *Choriambus* and a *Molossus*.

* See page 37. The *Zend* Letters are in Plate 3.

شیر مست سر بستان الم   پرورش یافتهٔ دامن غم

آب رنگ و رخ لیلای جنون   خال رخسارهٔ هامون مجنون

یافت چون راه بکاشانهٔ عشق   آستان شد بدر خانهٔ عشق

بر سرش شخص جنون سایه فگند   قصهٔ عاشقیش گشت بلند

در عرب هر طرفی غوغا شد   نقل او نقل مجالسها شد

بد امیری بعرب والا شان   صاحب مکنت و ثروت بجهان

ترکت از غم هجران دیده   پر گل داغ محبت چیده

دیده در طفلی خود سوز فراق   تلخی زهر فراقش بمذاق

یافت چون قصهٔ آن درد مآل   کرد فرمان بغلامی در حال

کسوی نجد قدم ساز ز سر   شو بتعجیل روان چون صرصر

آنکه دلبرده ز مجنون بنگاه   ببرم زود بیا در همراه

رفت و آورد غلامک در حال   لیلی آن پادشه ملک جمال

بغلامی دگرش شد فرمان   که تو هم شو بسوی دشت روان

جانب زینت ارباب جنون   شمع پر نور محبت مجنون

زود آور برم آن سوخته را   آن جگر سوز غم اندوخته را

رفت و برگشت غلامک چونگاه   والی کشور عشقش همراه

کرد او را چو نظر مرد امیر   دید زاری بغم عشق اسیر

بر سرش شخص جنون کرده وطن   زخم هجران به تنش پیراهن

موی سر بر بدنش گشته قبا   موزه از آبله پا بر پا

شانه از خار مغیلان بر موش　　خرقه از ریگ بیابان بر دوش
گفت کای گم شدهٔ وادی غم　　هیچ خواهی که تمنات دهم
سرفرازت کنم از مکنت و جاه　　لیلی آرم بسرت خاطرخواه
گفت نی نی که بعید است بعید　　ذره را هم نظری با خورشید
گفت خواهی که کنی راست بگو　　سیر آن صفحهٔ رخسار نکو
یا نداری بجمالش میلی　　راست بر گوی بجان لیلی
گفت کای قدوهٔ ارباب کرم　　ذرهٔ خاک درت تاج سرم
بر دلم درد لیلی کافی است　　خواهش وصل زبی انصافیست
بهر خورسندی این جزو حقیر　　بس بود پرتوی از مهر منیر
گفت و گردید سوی دشت روان　　دیده گریان و مژه اشک فشان

Shírmasti seri pistáni álem
perveresh yáftehi dámeni ghem

ābi rang ò rokhi lailáyi jonùn
kháli rokhsárehi hámún Mejnún

yáft chún ráh bi cáshánehi îshk
āsitán shud bideri khánehì îshk

ber seresh shakhśi jonùn sáyah ficand
kiśśehi âáshikì ásh gasht boland

der ârab her t́arafì ghaughà shud
nakli ù nokli mejális-hà shud

búd ámírì biârab válà shàń
śah́ibi micnat ò servat bijehàń*

* The reader will supply the point over *s*, when it stands for *th*.

torc tázi ghemi hejráń dídah
pur guli dághi moh́abbat chídah

dídah der t́ifliyi khód súzi ferák
talkiyi zahri ferákesh bimežák

yáft chun kiśśehí āń derd sigál
card fermáń bighulámì der h́ál

ceh súyì najd kadam sáz zi ser.
shau beh tâjíl ravàn chùn śerśer

āń ceh dil bordah zi Mejnùn bi nigàh
beh berem zúd biyáver hemràh

raft ò āvard ghulámac der h́ál
Laílì āń pádishahi mulci jemál

beh ghulámì digaresh shud fermán
ceh tò hem shau bi súyì dasht raván

jánibi zínati árbábi jonún
shemî pur núri moh́abbat Mejnùn

zùd āver berem āń súkhtah rà
āń jigarsúzi ghem ándúkhtah rà

raft ò bergasht ghulámac chú nigáh
váliyi cishvari îshkesh hemráh

card úrà chú nažar mardi ámír
díd zárì bighemi îshk ásìr

ber seresh shakhśi jonùn cardah vat́en
zakhmi hejràn bi tenesh piráhen

múyi ser ber bedenesh gashtah kobà
ṁúzah áz ābilahi pà ber pà

shánah áz khári mughíláń ber mùsh
khirkah áz rígi biyábáń ber dúsh

goft cáì gomshudahi vádiyi ghem
hích khwáhì ceh temennát dehem

serferázat cunam áz micnat ó jáh
Laílì ārem biberet khát́er khwáh

goft nì nì ceh baíídest baííd
żerreh rā hem nazarì bà khorshíd

goft khwáhì ceh conì rást bigú
saíri ān śafh́ahi rokhsári nicú

yá nedárì bijemálesh maílì
rást bergúyi bi jáni Laílì

goft cáì kodvahi árbábi cerem
żerrahi kháci deret táji serem

ber dilem derd zi Laílì cáfíst
khwáheshì vaśl zi bí ínsáfíst

bahri khorsendiyi ín jozvi h́akír
bas buvad pertavì áz mihri monír

goft ò gardìd súyì dasht ravàn
dídah giryán ò mizhah áshcfishàn

The Translation.

1. *The man who had* inebriated himself with milk from the nipple of Anguish, who had been nourished in the lap of Affliction,

2. MEJNU´N, mad with the bright hue and fair face of LAILI`, himself a dark mole on the cheek of the desert,

3. Having found the way to the mansion of love, became *fixed like* the threshold on the door of love's palace.

4. Over his head the form of Madness had cast her shadow: the tale of his passion was loudly celebrated.

5. Among the *Arabs* a tumult arose on all sides: the relation of his adventures was a dessert in their assemblies.

6. A powerful Prince reigned in *Arabia*, possessing worldly magnificence and riches:

7. He had seen the depredations of Grief through absence from a beloved object: he had plucked many a black-spotted flower from *the garden of* love.

8. Even in his infancy he had felt the pain of separation: the bitter taste of that poison remained on his palate.

9. When he learned the story of that afflicted lover, he instantly gave an order to a slave,

10. *Saying*, 'Make thy head like thy feet in running towards '*Najd;* go with celerity, like a violent wind:

11. 'Bring speedily with thee to my presence Her, who has 'stolen the heart of MEJNU´N with a glance.'

12. The stripling ran, and in a short time brought LAILI`, that Empress in the dominion of beauty.

13. To another slave *the* Prince gave this order: 'Run thou 'also into the desert,

14. '*Go* to that ornament of frantic lovers, MEJNU´N, the illu- 'mined taper of love.

15. 'Bring quickly before me that inflamed *youth*, that heart- 'consumed anguish-pierced lover.'

16. The boy went, and returned, in the twinkling of an eye, accompanied by the ruler in the territories of love.

17. When the Prince looked at him, he beheld a wretch in bondage to the misery of desire.

18. Madness had fixed her abode on his head: he was clothed, as with a vest, with the wounds of separation.

19. His locks flowed, like a mantle, over his body: his only sandal was the callus of his feet.

20. In his hair stuck a comb of *Arabian* thorns: a robe of sand from the desert covered his back.

21. 'O thou, said *the Prince*, who hast been lost in the valley 'of sorrow; dost thou not wish me to give thee the object of thy 'passion,

22. 'To exalt thee with dignity and power, to bring LAILI` 'before thee gratifying thy soul?'

23. 'No, no; answered he, far, far is it from my wish, that an 'atom should be seen together with the sun.'

24. 'Speak truly, replied the Prince, art thou not willing to 'recreate thyself on the smooth plain of that beautiful cheek?

25. 'Or hast thou no inclination to enjoy her charms? I adjure 'thee, by the soul of LAILI', to declare the truth!'

26. He rejoined: 'O chief of men with generous heart, a 'particle of dust from thy gate is a diadem on my head.

27. 'The pain of my love for LAILI' is sufficient for my heart: 'a wish to enjoy her presence *thus* would be injustice.

28. 'To gratify this contemptible soul of mine, a single ray 'from that bright luminary would be enough.'

29. He spake, and ran towards the desert, his eye weeping, and his eye-lashes raining tears.

These couplets would fully answer the purpose of showing the method, in which *Persian* may be written according to the original characters, with some regard also to the *Isfahánè* pronunciation; but, since a very ingenious artist, named MUHAMMED GHAU'TH, has engraved a tetrastich on copper, as a specimen of his art, and since no moveable types can equal the beauty of *Persian* writing, I annex his plate*, and add the four lines, which he has selected, in *English* letters: they are too easy to require a translation, and too insignificant to deserve it.

Huwa'l ázìz

Chashmi terahh'um zi tó dárìm mà
keblah tóyì rù beceh ārìm mà
h'ájati mà áz to ber āyed temàm
dámenat áz caf naguzárìm má.

VI.

The first specimen of *Hindì*, that occurs to me, is a little *Ghazal*, or love-song, in a *Choriambic* measure, written by GUNNA' BEIGUM, the wife of GHA'ZIU'LDI'N KHA'N, a man of consummate abilities and consummate wickedness, who has borne an active part in modern transactions of Upper *Hindústàn*.

---

* See Plate VI.

مدعی ہمسے سخن ساز بسالوسی هی
اب تمنا کو یہان مژدۂ مایوسی هی

آه اب کثرت داغ غم خوبانسے تمام
صفحۂ سینه میرا جلوۂ طاوسی هی

هی میری طرح جگر خون تیرا مدتسے
ای حنا کسکی تجهے خواهش پابوسی هی

عوض درد مزےسے وه بهرے هین سارے
جس لب زخم نے شمشیر تیری چوسی هی

تهمت عشق عبث کرتے هین مجهپر منت
هان یه سچ ملنے کی خوبانسے تو تک خوسی هی

Muddaïì hemsè sokhan sáz bi sálúsí haì
ab tamennà cò yehàn muzhdeï máyúsì haì

áh ab casrati dághi ghemi khúbán sé temàm
'safh'aï sínah mérà jilwaï t'aúsì haì

haì mérì t'arah' jigar khúni térà muddatsè
aì h'innà cisci tujhè khwáhishi pábúsì haì

áwazi derd mezè sè wah bherè hain sárè
jis lebi zakhm nè shemshíri térì chúsì haì

tohmati ìshk ábas cartè hain mujhper Minnat
hán yeh sech milnè cì khúbàn sè tù tuc khúsì haì

The Translation.

1. My beloved foe speaks of me with dissimulation; and now the tidings of despair are brought hither to the desire of my soul.

2. Alas, that the smooth surface of my bosom, through the marks of burning in the sad absence of lovely youths, is become like the plumage of a peacock.

3. Like me, O *Hinnà*, (the fragrant and elegant shrub, with the leaves of which the nails of *Arabian* women are dyed crimson), thy heart has long been full of blood: whose foot art thou desirous of kissing?

4. Instead of pain, *my beloved*, every wound from thy cimeter sucks with its lips the sweetness, with which it is filled.

5. The suspicion of love is vainly cast on MINNAT—Yes; true it is, that my nature rather leads me to the company of beautiful youths.

Thus have I explained, by observations and examples, my method of noting in *Roman* letters the principal languages of *Asia;* nor can I doubt that *Armenian*, *Turkish*, and the various dialects of *Tartary*, may be expressed in the same manner with equal advantage; but, as *Chinese* words are not written in alphabetical characters, it is obvious, that they must be noted according to the best *pronunciation* used in *China;* which has, I imagine, few sounds incapable of being rendered by the symbols used in this essay.

II.

ASTRONOMICAL OBSERVATIONS

n *FORT WILLIAM*, *and between* *MADRAS* *and* *CALCUTTA*.

BY COLONEL THOMAS D. PEARSE,

COMMANDANT OF THE ARTILLERY, AND SECOND IN COMMAND OF THE BENGAL ARMY.

I BEG leave to communicate to the Society some Astronomical Observations which I made at different times in *Fort William*.

The clock I used from December, 1775, was made by ELLICOT: it beats dead seconds: there is one hand for minutes, and the hours revolve with the plate fixed to the hour wheel.

The pendulum can be lengthened without stopping the clock, by means of a screw, which supports the spring by which the pendulum hangs. And the pendulum is described in the 47th volume of the Philosophical Transactions, page 479. The clock-case is firmly screwed to the wall. The transit instrument was made by SISSON; it is four feet long, and has a double object glass. This is supported by two iron bars, which are joined to a square frame, that lies two feet under the floor, buried in brick work.

The upright bars are protected by a case of wood, which is fixed to the house, without touching them in any part.

At first I used the cornice of the Commandant's house to adjust by; but afterwards a slider, with a slit in it, was put up in the area of the fort, near the same place, behind which I could place a light to adjust with by night. There was another object also to the south, about 1500 yards off, which I could use by day; and both these were fixed when the transits by telescope and equal altitudes agreed; and were examined from time to time.

I had only a tolerably good HADLEY'S quadrant and quicksilver, till December, 1776, when I was lucky enough to get an 18 inch land quadrant, made by RAMSDEN, with a micrometer, to subdivide the nonius. This inverts, and is capable of the nicest adjustments. My first telescope was an 18 inch reflector, made by GREGORY.

In August, 1777, I obtained MR. SMITH'S refractor, made by DOLLOND, with a triple object glass, and a double object glass micrometer. And I made a polar axis for it of brass with rack work, and a declination circle not divided, which also is racked; to which, when the micrometer was used, the telescope was fixed.

I likewise communicate observations made by myself chiefly, and by Lieutenant COLEBROOKE for me, to ascertain the longitudes and latitudes of places between *Madras* and *Calcutta*.

Going to *Madras* in 1782, I used an HADLEY'S octant and quicksilver, which I shall here describe.

The octant had a wooden index. I separated the part which carries the speculum from the arm; then fixed it into a lath, and turned it on its own centre: it was three-tenths of an inch thick; the thickness was divided into three parts, and then the edge was turned away on each side: so that the whole piece of wood became like three wheels of different diameters joined together on their flat surfaces, and the middle one was the biggest, that below was the next in size; and the upper one was the least, and only equal to the brass plate on which the speculum was screwed.

A plate of brass, nearly one-tenth thick, broad enough to admit of a hole as big as the under circular part of the turned wood, and to afford a rim of half an inch broad, was then fixed into the lath, and had a hole turned in it of that size; on one side it had an arm, as broad as the wooden index was.

A second plate of the same kind was also prepared; but the hole was larger, though less than the middle part of the turned wood

The turned piece was then fixed to the octant by its pin, and the plate with the smaller hole, beneath it. As they fitted very nicely, the brass plate turned upon the wood round the centre of the octant, if that were held fast; and both turned on the centre pin, if they were pressed together.

The plate, with the large hole, was then laid above the turned wood, its centre coinciding with the common centre: the wooden arm of the index had the end nearest the centre cut away, above and below, equal to the thickness of the plates of brass: it was there fixed to the octant in the same manner as before it was cut off from the centre, and the brass plates were drilled and rivetted to it.

When these plates were pressed together, they held the turned piece as it were in a vice: when they were forced asunder, the turned piece might be moved independently; and there were in the direction of the radius two screws, one beyond the speculum,

and one between it and the nonius, for the purpose: they had button heads, and their shanks were as high as the top of the index speculum.

On the back of the octant there was a screw with a button head, the thread entered the centre pin, and the shoulder pressed upon the plate which keeps that pin in its place.

The back screw and vice screws being slacked, the index speculum was brought parallel to the horizon glass, then the vice screws were turned to join the speculum to the index, as before the alteration was made.

To extend the power of the octant occasionally, it was nicely adjusted; then the index was carried to 90°, and there screwed to the limb: next, the back screw of the centre pin was forced, till by its pressure, the speculum piece was held fast; after that, the vice screws being slacked, the index was carried back to 0°, and there screwed to the limb. Whilst it was in this position, the vice screws were again turned, which fixed the speculum piece to the index, and then the back screw being slacked, the speculum followed its motions. When it was used, the index shewed the angle which was to be added to 90° for the angular distance.

By this contrivance, with an octant, I could take angles of 150°: and consequently meridian altitudes as far as 75°: and if the horizon glass and telescope could have been made to slide nearer towards the centre, it would have been increased still further.

In RAMSDEN'S new quadrant there is a screw to adjust the horizon glass, and bring it parallel to the other: provided the index speculum is perpendicular to the limb, this is all well; but if that be inclined, as soon as the index quits 0°, there will be an error in the angles observed. I found it so experimentally, and corrected my quadrants accordingly, by turning the horizon glass round its own axis, then having adjusted, as usual, the error sideways was corrected by moving both glasses, by means of their adjusting screws, and dividing the error between them. If, when the horizon glass was restored to its proper position, there still was a lateral error, the operation was repeated. I do not find any mention of this in any of the instructions for using HADLEY'S instruments that I have seen.

The horizon was artificial, invented for the occasion, and consisted of a wooden trough about ½ an inch deep, (or rather more,) filled nearly with quicksilver, which served to float a plate of thick glass, the under surface of which had been unpolished and blacked, that only one image might appear. This needs not any adjustment; the only requisite is, that the glass be equally thick all over, and smooth: that, which was used, was a part of a very large looking-glass, that had been broken by accident.

The watch was a time-keeper, by BROOKBANK, which goes whilst it is wound up, and is tolerably good, considered as a sale watch sent to *India.*

The telescope had a double object glass, with a brass stand, and was made by GREGORY: it magnifies 80 times, but, like all of this construction, that I have seen, it had a dark speck in the middle, and was not equally good in the whole field.

In the way back, we had a land quadrant, of 15 inches radius, made by B. MARTIN, and sent out by the *India* Company. It was used by MR. HURST in the transit of *Venus.* This could not be inverted. But to destroy the effects of collimation and error of level, the latitudes are all determined by stars taken north and south of each place, as the observations will shew.

T. D. PEARSE.

ASTRONOMICAL OBSERVATIONS

made at CALCUTTA.

By T. D. P.

JUPITER'S FIRST SATELLITE.

IMMERSIONS.

Date.	*Apparent time correct.* H. M. S.	*Time by Ephemeris.* H. M. S.	*Longitude.* H. M. S.	
1774, 14th Oct.	12.32.25	6.39.00	5.53.25	*Jupiter* very nearly vertical, and the glass shook much.
23d do.	8.57.15	3.03.17	5.53.58	
1776, 13th Nov.	13.58.56,3	8.04.46	5.54.10,3	
29th.	12.09.39	6.15.53	5.53.46	
6th Dec.	14.00.32,6	8.06.38	5.53.54,6	
13th.	15.50.59,3	9.57.02	5.53.57,3	
15th.	10.18.31	4.24.35	5.53.56	
22d.	12.08.47,6	6.14.50	5.53.57,6	
31st.	8.26.54,1	2.32.49	5.54.05,1	
1777, 16th Jan.	8.51.19,6	2.57.11	5.54.08,6	
27th Dec.	9.38.58,8	3.45.01	5.53.57,8	*Dollond's* triple object glass.
EMERSIONS.				
1774, 29th Dec.	11.25.47	5.31.52	5.53.45	
1777, 30th Jan.	12.36.11,8	6.42.30	5.53.41,8	
1778, 15th March.	8.40.49,6	2.47.41	5.53.08,6	*Dollond's* triple object glass.
7th April.	9.00.02,2	3.07.00	5.53.02,2	Ditto.
14th.	10.56.35,1	5.03.30	5.53.05,1	Ditto.
1779, 3d May.	12.07.38,8	6.14.37	5.53.01,8	Ditto.
SECOND SATELLITE. IMMERSIONS.				
1776, 4th Dec.	10.53.23,5	4.58.08	5.55.21,5	
11th.	13.25.50,4	7.30.42	5.55.08,4	
18th.	15.58.21	10.03.14	5.55.07,0	
29th.	7.48.01,4	1.52.27	5.55.34,4	
1780, 11th July.	9.34.17,3	3.41.33		Emerged from behind the body 9.27.04.3, and was quite clear of the body at 9.28.55,3. *Dollond's* triple object glass.

EMERSIONS.

Date.	Apparent time correct. H. M. S.	Time by Ephemeris. H. M. S.	Longitude. H. M. S.	
1775, 29th Dec.	8.47.47,7	2.53.18	5.54.23,7	
1777, 23d Jan.	7.32.44,3	1.37.41	5.55.03,3	
29th April.	7.20.34,1	1.25.43	5.54.51,1	
6th May.	9.59.28,9	4.04.11	5.55.17,9	
1779, 8th May.	11.45.53,5	5.52.13	5.53.40,5	Here the tables seem to have been corrected. *Dollond's* triple object glass.

THIRD SATELLITE.

1774, 10th Nov.	13.12.30	7.18.17	Emersion.	
1775, 28th Jan.	7.28.58,5	1.33.45	Immersion.	
	9.04.20	3.07.49	Emersion.	But I thought I saw it about a minute before; however it was so very dim that I cannot be certain.
1776, 3d Nov.	10.55.20,2	5.00.14	Emersion.	
17th.	15.31.51,3	9.42.37	Immersion.	
23d Dec.	11.10.33,6	5.19.58	Do.	
1777, 28th Jan.	10.13.13,2	4.22.53	Emersion.	
1778, 3d April.	9.21.24,9	3.33.12	Do.	I think I might have seen it earlier, if I had expected it to emerge at a greater distance than one Satellite appeared, which was the case. *Dollond's* triple object glass.
1779, 2d May.	8.44.37,5	2.54.27	Immersion.	Rather doubtful.
	45.26,5			I thought I saw it, but *Jupiter* was so very bright it dazzled my eyes.
	11.32.80,6	5.44.27	Emersion.	

FOURTH SATELLITE.

Date.	Apparent time correct. H. M. S.			
1776, 2d Nov.	13.23.14,0		Emersion.	
1777, 8th Jan.	9.28.49,5		Immersion.	
25th.	7.23.02,0		Emersion.	At the time of this observation, there was a very small star a very little to the west of the westernmost Satellite.
1778, 9th May.	8.25.13,0		Emersion.	*Dollond's* triple object glass.

Other Observations of Jupiter *and his Satellites.*

1776, 22d November, between 9 and 10, I saw a very small star, not bigger than a Satellite, very near to *Jupiter*. The configuration thus,

At $12^h. 9'. 39''$, the configuration was thus,

that is, the two outermost Satellites had gone forward, and *Jupiter* back, in right ascension, visibly.

30th November, the configuration was thus,

that is, the star was north; distant from the limb in declination about the quantity of the lesser axis. In right ascension the star was advanced further than *Jupiter's* centre, about a fifth of the axis. Some time after I found that the little Satellite, which was below the limb, had immerged into the disk; and soon after I saw the shadow of that Satellite upon the Great Belt. I observed the shadow go off the disk, and about an hour after that, the Satellite emerged a little to the north of the Great Belt. The times were noted, but the book was destroyed by accident. When *Jupiter* passed the meridian, I could not see the star in the transit telescope, but about 4′ afterwards the configuration was thus,

that is, a line drawn from the star to *Jupiter's* centre, made an angle with the Great Belt, which I judged to be about 41°, and in that direction, it was about the quantity o the lesser axis distant from the limb; so that *Jupiter* had moved back about ¾ of his diameter, from the time I first saw him to-night till he passed the meridian.

1776, 8th December, my clock was stopped by an earthquake, which spoilt the observation of the immersion of *Jupiter's* first Satellite.

1776, 23d December, an Emersion of the first Satellite from the Disk.

	Apparent time correct.
	h ′ ″
The shadow touched the middle of the edge of the Great Belt, and made a visible notch in it	11.26.00
It was still visible	28.05
It vanished	30.50
Satellite at the edge of the limb	53.25
In contact emerged	58.53

1777, 25th January, $7^{h}.23'.00'',6$, I saw a small star a little to the west of the westernmost Satellite, not so bright as either of them; it was hardly visible through the reflector.

Configuration thus,

26th, I could not find the star at $7^{h}.11'$.

	h ′ ″
29th May, *Jupiter's* second Satellite immerged behind the disk	7.25.18,7

1779, 2d May, an Immersion of Jupiter's *first Satellite into the Disk.*

	Apparent time correct.
	h ′ ″
In contact	11.31.37,6
Immersion doubtful	35.19,6
Certain	35.50,6

If the immersions and emersions of this nature were calculated so as to set astronomers to look out for them, *Jupiter's* satellites might be rendered more useful than they now are in regard to longitudes by land; and that too, whether the calculations are accurate or erroneous.

For I mean to use an immersion or emersion of any kind, only to note an instant for taking the altitude of *Jupiter* at the place of observation.

If the instruments be of equal powers, and the eyes of equal strength, then certainly the altitudes will be taken by every person, who shall observe the same phenomenon at one and the same instant of time; and thence the distance of *Jupiter* from the meridian of each will be known to seconds, if we suppose the latitudes known before hand.

And if the telescopes of quadrants could be made sufficiently powerful to observe the satellites, then a single observer, at any place, could perform the whole without trouble or difficulty, and would only need a common watch, and a little more patience than would be requisite if the watch were perfect and calculation true.

But supposing the telescopes and quadrants as they are, and two observers at each place, one employed with the Satellite, and the other with the quadrant, then the latter must carefully keep the body of *Jupiter* on the line of altitude till the other tells him to stop, which is to be done at the instant of observing the expected phenomenon.

By this mode, a degree of longitude may be measured with as much accuracy as a degree of latitude, and it is what I have in contemplation to perform, as soon as I can get the requisite instruments.

Remarks on some erroneous Observations of Jupiter's *first Satellite.*

In 1778, I took notice, that when *Jupiter* is very near the opposition, the observations are not to be depended on, and that the Satellite vanished without changing colour. The same happened in 1779, 1780, and again in 1784, at *Beemulwilsa*; therefore, I have put down the times of such observations, as they are reduced to apparent time, from the known deviation of the clock from mean time. The transit instrument was examined by stars that pass over the zenith, and by others north and south, and by equal altitudes, all which shewed it was as nicely in the meridian as it well could be.

In 1779, on the 3d March, I observed η and μ Geminorum, and the deviation was the same as that derived from the transits of the sun on the 23d February and 5th March. In the observation of the moon 23d November following, the accuracy of its position was ascertained, so that the times were correct; and the errors depend on something at the Satellite and planet. Perhaps *Jupiter's* atmosphere may be so dense as to prevent the free passage of the diminished light soon after the beginning of an eclipse, or even before it. If so, these observations may tend to clear up that point, and to measure the extent of that atmosphere.

Date.	*Apparent time correct.* H. M. S.	*Ephemeris.* H. M. S.	
1778, 4th Feb.	7.51.10,3	1.58.08	
1779, 23d do.	9.02.51,0	3.10.01	
2d March.	10.58.15	5.05.17	
9th do.	12.53.08	7.01.07	These two were observed at *Dumdum*, but the time was taken from the transit instrument by a watch, carried out before and back after, and compared with the clock.
11th do.	7.20.35,3	1.30.10	
1780, 13th March.	10.10.47,7	4.20.23	

All these observations were made with *Dollond's* triple object glass.

Observations of Venus.

1776, 2d January, at $7^h.55'$ in the morning, I measured the distance between *Venus* and the *Sun* 46°.32'.

I was informed the natives were viewing it with astonishment, but I did not see it with the naked eye. Through the little telescope of my HADLEY'S quadrant it appeared as bright as *Capilla*.

	Apparent time correct. h ′ ″
1777, 1st July, *Venus* passed the meridian	21.30.41,5
14th, *Venus* visible to the naked eye, and has been so three days.	
Passed the meridian	21.01.02,0

Distances from the Sun, measured with an HADLEY'S *Quadrant.*

	h ′ ″
West limb 41°.57′	21.21.58,5
East do. 42.29	25.08,5
15th, Passad the meridian	20.59.29
16th, Do.	58.08,5

17th, Still visible.

Distances measured as before.

	° ′			h ′ ″
From nearest limb	42.31	...	...	0.08.10
From furthest do.	43.05	...	...	0.12.14

1780, 18*th March, an Appulse of* Venus *to* Mars.

Distances. Inch.	Non. ′ ″			*Apparent time correct.* h ′ ″
2,45 „	3 = 15.17,2	...	...	7.39.33,9
2,45 „	8 = 15.20,9	...	...	44.33,9
2,45 „	5 = 15.18,7	...	...	49.33,9

N. B. The scale of the micrometer is divided into twentieth parts of an inch, and the nonius subdivides these into twenty-five parts each.

The next morning the *Sun's* diameters were measured.

	Inch.		*Non.*
Horizontal	5,15	„	17,25
Vertical	5,10	„	21
Mean ...	5,15	„	06,625
Error of micrometer		+	4
	5,15	„	10,625

Sun's diameter by Ephemeris 32′.11″,6, from which the distances were calculated.

19*th March, Difference of Declinations and right Ascensions.*

Inch.	*Non.* ′ ″			*Apparent time correct.* h ′ ″
4,20 „	00 = 26.08,7	at	...	7.41.51,4
Mars passed the vertical wire			...	43.09,4
Venus do.	...	...	...	45.16,4

Mars was south of *Venus.*

Observations of Mars.

An Appulse of Mars *to* κ Libræ.

Distances. *Inch.*	*Non.* ′ ″			h ′ ″
1,00 „	19 = 6.18,5	...	...	10.50.05
1,00 „	17 = 6.17,0	...	...	10.58.05

The star was west of *Mars.*

Observations of the Moon.

1775, 12*th January, an Occultation of* Aldeberan.

Immersion ... ... 8.54.55 (h ′ ″)

I believe the watch was set by equal altitudes, but I have lost the book in which the entry was made, and have only a copy of my observations as a register of this and the next that follows.

15*th February, an Eclipse of the* Moon.

End 10.15.00,5 (h ′ ″), apparent time correct.

1776, 3*d March, an Occultation of* Regulus.

Not having an ephemeris at the time, the observation was accidental, and consequently not prepared for. The transit instrument was but lately put up, and had not been much used, but it was the only resource for time: accordingly, it was adjusted truly as to level and wires, but it was not in the meridian accurately. Therefore the transits of several stars were taken to determine the position of the instrument, and the error of that being known, the times could be corrected by a very easy rule, which I subjoin. Let x be the error in seconds at the horizon, a and b the sines of the zenith distances of two stars, A and B the sines of the polar distances, d the difference of the errors of the clock, as found from the observed and the calculated transit of those two stars. Then $\frac{xa}{A}$ will be the space at the equator for the equation to correct one, and $\frac{x\ b}{B}$ the same for the other; and the sum of these two will be equal to $d\times 15$. or, which is the same thing, $\frac{x\ a}{15\ A}+\frac{x\ b}{15\ B}=d$. Whence for all small angles $x=\frac{15\times d\times A\ B}{a\ B+b\ A}$.

ζ and γ *Leonis* were the two stars that were relied on for time and position, because they pass so nearly at equal distances from the zenith, that the mean of their errors of the clock would be so near to the true one, that any clock yet invented could not shew the difference actually.

The difference of their errors was 5″,6 and thence the error of the transit instrument was only 1246″,16 at the horizon, and the distance of the wires of the telescope is 1478″

3d March,	*Times of passing the Middle Wire.*	*Equation for the Error of the Instrument.*	*Passage by Calculation.*	*Error of Clock.*
☽ West Limb	10.58.19,5	−15,08		
η Leonis	11.01.45,0	− 7,16	10.54.56,8	6.41,04
α Leonis	03.11	−14,07	56.15,9	6.41,03
ζ The Northern	10.33			
ζ The Southern	10.39	+ 3,01	11.04.00,6	6.41,41
γ The Southern	14.04			
γ The Northern	14.08	− 2,59	07.24	6.41,41
δ Ursæ Majoris	13.08.48	+92,27	13.03.43,9	6.36,37
ε Ursæ Majoris	48.40	+92,01	43.34	6.38,00
Immersion,	14.02.39,5			
It was emerged, but I did not see the Emersion.	52.30			

6th *March, equal Altitudes, by an* HADLEY'S *Quadrant and Quicksilver.*

Quadrant. ° ′			h ′ ″	
30.00	rising	...	20.29.41	
	falling	...	27.42.30	6.05,5
30.30	rising	...	20.32.14	
	falling	...	27.39.56	6.05,0
		Mean	...	6.05,25
	Equation of equal altitudes		...	7,10
				5.58,15

This compared with the error of the clock by ζ and γ, shews that it was loosing 17″,06 daily; at which rate, to the time that ε Ursæ Majoris passed the meridian, it must have lost 1″,95, and the error by ε ought to have been 6′.39″,4. The difference is only 1″,4, which is not greater than the errors of observation may sometime be in stars of great declination.

Result.				*Apparent time correct.* h ′ ″
☽ West limb passed the meridian		...	...	10.51.23
Regulus	...	...	...	56.15,5
Immersion	...	...	...	13.56.00,15

And emerged in less than 50′.

1776, 30th *July, an Eclipse of the* Moon.

Beginning of total darkness.

				Apparent time correct. h ′ ″
By eye	...	...	...	17.00.49
By telescope	...	...	...	01.16

Clouds prevented any other observations.

1777, 20th *January, an Occultation of* ζ Geminorum *by the* Moon.

			Apparent time correct. h ′ ″
Immersion	...	...	13.37.38,6

23d *January, an Eclipse of the* Moon.

				Apparent time correct. h ′ ″
Eclipse began	...	...	...	8.41.21,7
Shadow well defined	...	...	...	44.33,7
Mare Humorum touched	...	...	...	49.13,7
Grimaldus, do.	...	...	...	50.43,7
Grimaldus passed	...	...	...	53.18,7
Mare Humorum, do.	...	...	...	53.33,7
Tycho's dark circle touched		...	...	56.13,7

Tycho's body, do.	56.40,7
Copernicus, do.	9.26.28,7
Do. passed	33.23,7

Going off again.

Copernicus passed	10.12.58,5
Grimaldus, do.	21.23,5
Mare Humorum touched	36.17,5
Aristæus passed	37.33,5
Mare Humorum, do.	47.23,5
Regiomontanus, do.	11.00.08,5
Tycho's body	02.33,5
Tycho's dark circle passed	05.38,5
Vendelin, do.	12.23,5
Faint Penumbra remained	32.25,5
Limb clear. End	33.33,5
☽ West limb passed the meridian	12.03.22,7
East do. do.	05.38,2

The times are those of the shadow's edge, unless it be otherwise expressed.

1777, 13th *February, an Occultation of* μ Ceti.

	Apparent time correct.
	h ′ ″
Immersion	7.53.46,7

I was very certain of the time of the immersion. Five seconds before it, the star began to change colour and to loose light sensibly; one second before the immersion, it was considerably broader and redder than at first; and the light was not so strong as before.

This supports the supposition of an atmosphere round the moon, though it does not extend to any great distance. It has been doubted, and is, I believe, not yet absolutely admitted. But our atmosphere may be doubted by an inhabitant of the moon, for if to its greatest extent, supposed 45 miles, it were of the same density as at the surface of the earth, which is not the case, it would not subtend a minute, as the earth is 8000 miles in diameter, and the greatest parallax only 62′.

1777, 16*th May, an Appulse of the* Moon *to* ν Scorpii.

	Apparent time correct.
	h ′ ″
☽ West limb passed the meridian	7.59.50,1
ν Scorpii do.	8.00.02,1

By the arch of the transit instrument, the star was 10′ from the limb.

1779, 1*st May, an Appulse of the* Moon *to* Mars *and* Saturn.

Having brought the *Moon's* limb to run along a wire of declination,

	Apparent time correct.
	h ′ ″
The eastern limb passed the vertical wire ...	10.23.09,5
Saturn passed the same	10.23.21,5

Saturn did not come within the scale of the micrometer.

For the right Ascensions.

		Apparent time correct.
		h ′ ″
Mars	Passed the meridian at ...	12.55.42
Saturn		56.34
☽ Eastern limb		57.36

Distances of the Moon *and* Mars.

Inch.	*Non.*	′ ″		*Apparent time correct.*
4,70	„ 08,5	= 28.40,3	... ...	13.18.42,5
4,65	„ 21	= 28.31,1	... ...	26.34,5
4,65	„ 15	= 28.26,7	Mean of the three times and the same measure ...	31.53,5
4,65	„ 21	= 28.31,1	... ...	36.49,5
4,70	„ 05	= 28.37,7	... ...	41.06,5

1779, 3*d May, an Appulse of the* Moon *to* b Ophiuchi.

Difference of Declination.

Inch.	*Non.*	′ ″		*Apparent time correct.*
4,70	„ 17	= 28.09,9	... ...	10.22.58,1

The star was to the west of the *Moon's* horn from which the distance was measured, because the micrometer could not take in the limb.

Inch.	*Non.*		*Apparent time correct.*
4,60 "	17	= 28′.09″,9	10.22.51,1

Examination of the Micrometer.

	Inch.	*Non.*
1st May, 19ʰ.29′. lesser diameter of the *Sun* ...	5,2 "	13
Again, ...	5,2 "	15
Greater diameter	5,2 "	23
Again	5,2 "	24
Hence mean diameter ...	5,2 "	17,5

There are twenty-five nonius to divide one twentieth of an inch. When the limbs coincided the zeros agreed.

The ephemeris gives 15′.54″,6 for the semi-diameter, therefore one nonius is equal to 0″,7294.

1779, 23*d November, an Eclipse of the* Moon.

	Apparent time correct. h ′ ″
Beginning	12.02.33,0
Shadow well defined	03.36,0
Aristarchus	10.37,9
Insula Ventorum	12.14.32,9
Copernicus	21.18,9
Mare Vaporum	32.07,8
Bright spot in Mare Vaporum	34.27,7
Tycho's body touched	35.29,7
Mare Serenitatis, do. the border	35.47,7
Tycho passed	36.52,7
Mare Tranquilitatis touched...	40.17,6
Ariadæus	41.37,6
Mare Serenitatis passed	44.07,6
Meerob	51.37,5
Mare Crisium touched	52.37,5
Do. passed	56.40,4

	Apparent time correct. h ′ ″
Total darkness by eye	13.00.37,5
By telescope	01.41,3
Do. end by telescope	14.40.13,3
By eye	41.16,3
Grimaldus passed	43.06,3
Aristarchus	50.42,2
Insula Ventorum touched	53.46,2
Passed	54.20,2
Copernicus	15.02.44,1
Tycho's body touched	04.56,0
Passed	06.23,0
Mare Crisium touched	32.22,7
Passed	35.55,7
Mare Fæcunditatis passed	37.23,6
End by telescope, doubtful	39.45,6
Certain	42.00,6

The apparent times here noted in these observations were derived from the mean times. The difference between the clock and mean time being applied to the hours shewn by the clock. And as the difference or equation was derived from the transit instrument, here follows an examination of its position.

	Transits over the middle wire by clock.	*Difference between the clock and mean time.*
22d November,	h ′ ″	
☉ West limb ...	23.42.34	
East do. ...	44.53	
Centre	23.43.43,5	
Eqtn. time ...	0.13.19,5	
		—2′.57″ to be added to all the transit hours.
23d November,		
α Arietis ...	9.42.02	
☽ West Limb ...	11.38.28	
☽ East do. ...	40.51	
Rigel	12.50.41	
Bellatrix ...	13.00.01	
Castor	15.06.51	
Procyon	14.05	
1st December,		
☉ West Limb ...	23.45.26	
East do. ...	47.47	
Centre	23.46.36,5	
Eqtn. of time ...	10.17,7	—3′.05″,8

Equal Altitudes with the Quadrant which has only one Wire.

	N. B. Before and after this last transit.	*Another altitude not moved.*
	h ′ ″	h ′ ″
Rising U limb	20.16.41	20.23.47
L limb	20.19.38,5	20.26.46,5
Falling L limb	27.13.27	27.06.17
U limb	27.16.23	27.09.19
Centre	23.46.32,4	23.46.32,4
Equation of equal altitudes		+ 4,37
		23.46.36,77

	Apparent time correct.
	h ′ ″
1780, 18th February, ☽ East limb passed the meridian...	10.39.31,6
15th April, ☽ West limb past the meridian ...	9.17.34

5th August, an Appulse of the Moon *to* Jupiter.

☽ West limb passed a circle of the meridian ...	7.14.44
Jupiter's western limb	14.48
Eastern do.	14.58
Centre	18.49
☽ West limb	00.53
Jupiter's centre	25.06
☽	25.19
Jupiter's centre	42.31
☽	43.08
Jupiter	51.21
☽	52.15
Jupiter	8.42.22
☽	44.42

The difference of declination of *Jupiter* and the nearest horn of the *Moon*, was ... 9′.01″,4 at ... 7.28.40

Distances of Limbs.

′ ″	
14.33,2	7.32.12
15.01,5	35.36
15.32,7	38.53
16.25,9	44.31
17.06,5	48.16
30.58,6	8.35.49

OBSERVATIONS *at large for determining the Latitude of the* TREASURY GATE *in* FORT WILLIAM *in* BENGAL.

	Face East.	*Face West.*	*Mean or observed altitude.*	EQUATIONS. *Refraction.*	EQUATIONS. *Aberration.*	EQUATIONS. *Nutation.*	*Altitude correct.*	*Declination.*	*Latitude.*
	° ′ ″	° ′ ″	° ′ ″	″	″	″	° ′ ″	° ′ ″	° ′ ″
γ Tauri ...	89.57.37,3	89.58.16	89.57.56,6	0	+ 2,34	− 0,43	89.57.54,7	22.30.56,4	22.33.01,7
τ Tauri ...	88.41.47	88.42.28	88.42.07,5	− 1,2	+ 0,82	− 0,63	88.42.06,5	21.15.26,2	19,7
O Tauri ...	89.09.49,7	89.11.04	89.10.26,9	0,7	+ 0,95	− 0,39	89.10.25,1	21.43.46,5	21,4
ζ Tauri ...	88.25.48,8	88.26.45,0	88.26.16,9	1,4	+ 0,7	+ 0,7	88.26.16,9	20.59.23	06,1
132 Tauri ...	88.05.07,9	88.04.17	88.04.42,5	2,9	+ 1,11	+ 1,05	88.04.41,8	24.28.25,9	07,7
H Geminorum	89.18.11,7	89.17.08	89.17.39,8	0,6	+ 0,16	+ 1,49	89.17.39,8	23.15.25,3	05,1
μ Geminorum	89.57.17,3	89.55.58,0	89.56.37,6	0	+ 0,44	+ 2,03	89.56.40,4	22.36.32,7	13,1
ν Geminorum	87.46.28,2	87.47.17	87.46.52,6	2,2	+ 0,84	+ 2,6	87.46.53,8	20.20.00,3	06,2
								Mean ...	22.33.09,4
Aldeberam ...	83.29.09,7			6,7	+ 0,82	− 0,63	89.29.03,2	16.02.58N.	22.33.54,8
Rigel ...	58.57.52,2			33,7	− 5,1	+ 0,12	58.57.13,8	8.28.15,9S.	34.30,3
α Orion ...	74.47.00			15,3	− 2,2	+ 1,28	74.46.43,8	7.20.57 N.	34.13,8
γ Geminorum	84.00.29,9			6,0	+ 2,5	+ 2,00	84.00.28,4	16.34.11N.	33.47,6
Syrius ...	51.00.43,5			45,5	+ 4,6	− 2,75	51.00.00	16.25.04,3S.	34.15,7
								Mean ...	22.34.07,4
Capella ...		66.47.18		23,5	+ 6,8	− 0,06	66.47.00,3	45.45.12,5	22.32.12,8
β Tauri ...		84.08.43		5,6	+ 2,4	+ 0,37	84.08.40,2	28.24.08	48,2
136 Tauri ...		84.59.37,1		4,8	+ 1,2	+ 1,2	84.59.34,7	27.32.27,1	01,8
θ Aurigæ ...		75.21.42,8		15,0	+ 2,4	+ 1,2	75.21.31,4	37.10.34	05,4
ε Geminorum		87.12.30		2,9	+ 0,4	+ 2,6	87.12.29,3	25.19.52,4	11,7
								Mean ...	22.32.16
								Mean of the last two sets,	22.33.11,7
								Double collimation, or difference of the last two sets,	1.51,4
								Latitude by the whole,	22.33.10,55

N. B. Face east. 15th Jan. 1779, when the barometer was 30,05, and the thermometer 63,5.

Face west 19th Jan. when the barometer was 30,05, and the thermometer 65, agreeably to which the refraction is taken.

TRIVATOORE.

Observations by T. D. P. 1783.

	Day.		h ′ ″		′ ″
⊙ On the meridian, December	5,	...	23.33.52,5,	slow	26.07,5
⊙ On the meridian, December	6,	...	23.35.53,1,	slow	24.06,9
Daily gain		...	...		2.00,6

The equation of equal altitudes was applied.

An Emersion of Jupiter's *first Satellite.*

		h ′ ″
6th December, by watch emerged	...	6.31.53
Too slow at noon	...	+26.07,3
Gain till observation	...	—34,4
Emersion	...	6.57.25,9
Ephemeris	...	1.36.52,0
Longitude in time	...	5.20.33,9
in degress	...	80°.08′.28″,5

⊙ On the meridian, December 28	...	23.26.37	
Equation of E. A. ...	...	—1,9	
		23.26.35,1,	slow 33′.24″,9
⊙ On the meridian, December 30	...	23.23.40,3	
Equation of E. A. ...	...	—1,9	
		23.23.38,4,	slow 36.21,6

Daily loss ... 88″,4

An Emersion of Jupiter's *first Satellite.*

		h ′ ″
29th December, by watch emerged	...	6.27.07
Too slow at noon ...	...	33.24,9
Loss till observation at 88, 4	...	25,8
Emersion	...	7.00.57,7
Ephemeris	...	1.40.44,0
Longitude in time ...	...	5.20.13,7
in degrees	...	80°.03′.24″,6
The mean of the two longitudes	...	80.05.56,5

The distance between the flag in the fort, and the place of observation at *Trivatoore*, was determined by a long base measured in the sands, and by taking angles for trigonometrical calculations.

Madras flag, distance ... ... 2787,1 feet.
Bearing ... ... S. 10.33.50 W.
Which give difference of Longitude 50″,5.
Latitude 4′.30″,7.

VIPEREE.

Having borrowed the quadrant that MR. HURST used in the transit of *Venus*, I was desired not to alter its line of collimation till I had determined the quantity of error: those observations are in the tables of latitude. It was used in the survey to *Calcutta*.

As I intended to observe at this place, I determined its distance from the fort as accurately as I could by trigonometry. The result is:

Madras flag, distance ... ... 8072,2 feet.
Bearing ... ... S. 23.15,00 E.
Which gives difference of Latitude 31″,5

MADRAS.

			° ′ ″
Latitude of *Trivatoore*, see table	...	...	13.09.00,4
Madras south of it	...	...	— 4.30,7
		Latitude ...	13.04.29,7
Latitude of *Viperee*, see table	...	...	13.05.05,4
Madras south of it	...	...	— 31,5
		Latitude ...	13.04.33,9
Mean 13.04.31,8			
Longitude of *Trivatoore*, mean	...	...	80.05.56,5
Madras west of it	...	...	— 00.50,5
		Longitude ...	80.05.06,0

WUNGOLE, 1782, *commonly called ONGOLE.*

Observations by T. D. P.

14th November, double altitudes of the pole, with the small sextant made by RAMSDEN, and the artificial horizon.

Watch.	*Angles.*	
9.16.12	34.45.30	these were with the small sextant.
21.00	47.30	
31.00	45.30	
49.00	46.30	this was with the large sextant.
9.29.18	34.46.15	
	17.23.08	
	+ 2.40*	beneath meridian.
	— 2.58	refraction.
	17.22.50	meridian altitude.
	1.51.13	polar distance.
	15.31.37	Latitude.

16th November, with the octant double altitudes of the *Sun*.

	Upper L.	*Lower L.*
	° ′ ″	° ′ ″
12.00.28	111.51.00	
2.24	54.00	
4.14		110.48.20 M. A.
5.41	111.56.00 M. A.	
6.36		110.47.00

Observed altitude	...	55.41.05
Ref. and par.	...	— 34
Meridian altitude correct	...	55.40.31
Declination	...S.	18.49.05
Co. Latitude	...	74.29.36
Latitude	...	15.30.24

1784, The Latitude observed by T. D. P. (see observations at large) was, 15°.29′.16″.

This is inserted only to bring to test the accuracy of the octant, which is mentioned (page 48) in the introduction: and it appears, that by a single observation made with it, the Latitude was determined within 1′.8″.

It serves also to shew that, though it is very difficult to take double altitudes of so faint a star, in low latitudes, even the polar star may be used to great advantage: and in these hot climates the stars only can be employed, for the *Sun's* heat at noon, after a long march, is really not to be borne by any constitution.

MASULIPATAM, 1782. *By* T. D. P.

27th October, ⊙ diameter forward 33, backward 32, } then set the speculum to 90°, and shifted the index back.

Double altitudes of the *Sun's* lower limb, taken with the HADLEY'S octant and the artificial horizon.

Watch.	*Angles.*	
h ′ ″	° ′ ″	
12.19.21	120.52.20	
20.32	120.55.20	
28.17	121.21.00	
30.40	121.23.30	
31.38	121.24.00	
32.34	121.25.40	Meridian.
34.23	121.23.20	

				° ′ ″
Observed meridian altitude	...	...	L. L.	60.42.50
Error of quadrant	...	...	...	—30
Semi-diameter	...	...	...	+16.10
Ref. and par.	...	...	...	— 27
		Altitude	...	60.58.03
		Declination	...	S. 12.51.09
		Co. Latitude	...	73.49.12
		Latitude	...	16.10.48

28th October, quadrant the same as above.

		° ′ ″
The mode the same, double altitude	...	120.45.00
Meridian altitude correct	...	60.37.42
Declination	...	S. 13.11.55
Co. Latitude		73.49.37
Latitude		16.10.23

1st November, ⊙ diameter, 34 forwards, 33 backwards, } then set the speculum to 90°

Time.	*Upper L.*	*Lower L.*
h ′ ″		
12.14.56		
	119.13.10	
15.33	———	118.04.30 M. A.
16.11	119.14.50 M. A.	

			° ′ ″
Observed meridian altitude	...	...	59.19.50
Ref. and par.	...	...	—30
Error of quadrant	...	...	—30
Meridian altitude		...	59.18.50
Declination		...	S. 14.30.45
Co. Latitude		...	73.49.35
Latitude		...	16.10.25

The same day Lieutenant HUMPHRYS observed with a sextant made by RAMSDEN, about four inches radius; he made the angles of the lower limb 118°.09′.00″, and the error of his quadrant was—2′, which gave the latitude 16°.11′.05″. This was intended as a kind of test of the instruments, but it was not a fair one, and yet the result is closer than could be expected, considering the difficulty of reading the small one.

Mean of three latitudes with octant 16°. 10′.32″

	h ′ ″		′ ″
⊙ On meridian, October 29th,	00.04.56 too fast	...	4.56
———30th,	00.08.36,5	...	8.36,5
By the small watch,			
———31st,	00.12.37	...	12.37
November 1st,	00.16.36,5	...	16.36,5

Examination of the large watch used at the observation of *Jupiter's* Satellite.

29th October, altered the spring and set it a-going at one o'clock.

		Small Watch.	*Large Watch.*		
		h ′ ″	h ′ ″		′ ″
October 29th	...	22.37.00			
Too fast	...	8.23,2			
Solar time		22.28.36,8	22.34.42	too fast ...	6.05,2

		Small Watch.	Large Watch.	
		h ′ ″		
November 1st,	...	1.46.00		
Too fast	...	0.16.54		
Solar time	...	1.29.06	1.35.57,5 too fast ...	6.51,5

Therefore in 51 hours solar time the large watch gained 46″,3.

An Emersion of Jupiter's *first Satellite.*

		h ′ ″
1st November, by watch emerged	... ...	7.27.20
At last observation, too fast	...	—06.51,5
Gained afterwards at 46″,3	...	—05,3
Emersion	...	7.20.23,2
Ephemeris	...	1.56.15
Longitude in time	...	5.24.08,2
in degrees...		° ′ ″ 81.02.03

The observations before written were made at the Chief's garden. The Fort flag was distant 2′,5″ in a strait line, and bore S. by. E. which give difference of

		′ ″
Longitude	... ...	+0.30
Latitude ...	... ...	—2.28

Longitude of Gardens	...	81.02.03
		+30
Longitude of Flag	...	81.02.33
Latitude of Gardens	...	16.10.32
		— 2.28
Latitude of the Flag	...	16.08.04

PEDDAPOORE, 1784.

Observations by T. D. P.

		h ′ ″
α *Serpentis*, on the meridian, June 18th	...	9.36.45
Do. 19th ...	...	9.28.57,5
		7.47,5
Acceleration for the time	...	4.09,4
Loss in one day	...	3.38,1

⊙ On the meridian, June 18th, ... $\overset{h}{23}.\overset{\prime}{51}.\overset{\prime\prime}{47},75$ slow ... $\overset{\prime}{8}.\overset{\prime\prime}{12},25$

An Emersion of Jupiter's *first Satellite.*

The Planet was extremely bright, and the Belts distinct and clear ; the glass perfectly steady.

		h ′ ″
19th June, by watch changed colour ...	...	15.16.22
Immerged	...	15.18.38
Too slow at noon	...	+ 8.12,25
Loss to observation at 219	...	+ 2.21
Immersion	...	15.29.11,25
Ephemeris	...	10.00.13
Longitude in time		5.28.58,25
in degrees ...		° ′ ″ 82.14.34

From the observations at *Calcutta*, it appears that there is a difference between the Longitudes derived from observations of immersions and emersions.

	h ′ ″
The mean of Longitudes, 10 in number, derived from observations of immersions, with an 18 inch reflector, was	5.53.53,77
Of emersions (2) with the same instrument ...	5.53.43,04
The single immersion with *Dollond's* triple object glass is	5.53.57,08
The mean of 4 emersions with the same ...	5.53.03,09
Difference by the reflector	0.00.10,77
By *Dollond's* refractor	0.00.54,90
The mean of all the immersions (11)	5.53.54,13
Emersions (6)	5.53.17,04
Difference	36,73

As the glass with which the observation was made differed from both, the difference derived from the whole is to be preferred, and so 9′.25″ are to be subtracted from this, to compare it with the other places, which were all emersions, and then the longitudes of *Peddapoore* by emersions will be 82°.05′.19″.

KOSSIM KOTTA, 1782.

Observations by T. D. P.

9th October, double altitudes of *Jupiter* from the artificial horizon.

h ′ ″		° ′ ″		
7.47.00	—	55.10.00		
48.36	—	54.28.50	*Jupiter's* R. A. at the time	h ′ ″ 17.32.06,7
49.57	—	54.01.20	Declination do. ...	S. 23°.12.10
50.58	—	53.37.10	☉ R. A. at do. ...	13.00.24,8
52.02	—	53.13.10	Latitude	17.42.30
53.05	—	52.50.00	Derived from the observed latitudes of *Elmulchillie* and *Sobaurum.*	
7.50.16 Mean,		26.56.43	Apparent altitude.	
		— 1.51	Ref.	
		26.54.52		

		h ′ ″
From the above data the planet had passed the meridian		3.16.37,3
	Jupiter's R. A. ...	17.32.06,7
		20.48.44
	☉ R. A. ...	13.00.25
	Time ...	7.48.19
	Watch ...	7.50.16
	Too fast...	1.57

The watch gained 12″ daily by the meridian of *Vizacpatam.*

An Emersion of Jupiter's *first Satellite.*

		h ′ ″
9th October, by clock emerged		7.11.45
	Too fast at the observation ...	— 1.57
	Emersion ...	7.09.48
	Ephemeris ...	1.38.00
	Longitude in time ...	5.31.48
	in degress ...	82°.57′.00″

VIZACPATAM, 1782.

Observations by T. D. P.

An Emersion of Jupiter's *second Satellite.*

		h ′ ″
3d october, emerged		8.30.58
	Ephemeris ...	2.57.20
	Longitude ...	5.33.38
		83°.24′.30″.

An Immersion of Jupiter's *third Satellite.*

		h ′ ″
7th October, immersion	... ...	8.09.57

The time was shewn by MR. RUSSELL'S time-keeper, which was made by ARNOLD, and was regulated by the meridian line in his hall.

7th September, an Emersion of Jupiter's *first Satellite.*

by T. D. P. 1784.

		h ′ ″
7th September, by watch emerged	... ...	8.23.38
Sky remarkably clear, and glass steady.		
Full splendor ...	... ...	25.40

Observations for Time.

				Zenith Distance.
		h ′ ″		° ′ ″
7th Sept., ⊙ U. L.	22.22.25	By arch of 90	...	41.29.20
				D. S.D. Non.
	24.48	96	...	44.01,01

		° ′ ″
Lat. by 2 northern stars	See observations at large	17.44.33,4
2 southern stars	under *Vizacpatam.*	17.38.46,5

N. B. Refraction + 50″	True Latitude ...	17.41.45
	Error of Collimation ...	+02.58
⊙ Declination for the time and place	... N.	5.30.39

		h ′ ″
From the above data the time was ...	...	21.17.15,5
	By the watch ...	20.23.36,5
	The watch too slow	53.39

Day.	Middle Wire.	Upper Wire.	
	h ′ ″	h ′ ″	
8th september, *a Aquilla* rising	7.01.13	7.03.16	
falling	8.07.35	8.05.30	
			h ′ ″
On the meridian ...	7.34.24	7.34.23	= 7.34.23,5
Passage by calculation		...	... 8.29.55,5
	Watch too slow	...	55.32

8th September, Zenith Distance.

	h ′ ″		D. S.D. Non.	Zenith Distance. ° ′ ″
⊙ L.	19.13.55	90	——————	56.59.20
⊙ U.	16.06	96	60.03.05 —	56.59.23
U.	16.49	90	——————	56.18.20
L.	19.00	96	60.00.07 —	56.18.04,6
U.	21.57	90	——————	55.05.00
L.	24.09	96	58.03.00 —	55.04.41,2
U.	25.18	90	——————	54.18.00
L.	27.28	96	57.03.20 —	54.17.12,7
	19.20.20		Mean, ...	55.40.00,3

		° ′ ″
⊙ Declination	...	N. 5.09.42
Latitude ...	...	17.41.45

		h ′ ″
From the above data, time	...	20.17.30
	Watch ...	19.20.20
	Watch slow	57.10

Therefore the watch lost in 22.57 h ′	...	2.11,0 ″
And consequently daily ...	...	2.21,0

Day	h ′ ″		h ′ ″
8 at	7.34.23,5	watch too slow	55.27.9
7 at	8.23.38	the emersion happened ...	h ′ ″ 0.55.32,0
Difference,	23.10.45,5	loss in this time, at 221 ...	— 3.33

Therefore slow at emersion ...	51.59
Emersion by watch ...	8.23.38
Time of emersion ...	9.15.37
Ephemeris ...	3.42.56
Longitude in time ...	5.32.41
in degrees ...	° ′ ″ 83.10.15

October 23d, an Observation of Jupiter's *first Satellite, by*

MR. MAXTON.

The glass the same as mine; and the watch corrected by MR. RUSSEL'S meridian line.

		h ′ ″
Emersion by watch	...	10.05.30
Watch fast ...	...	— 6.05
Emersion ...	...	9.59.25
Ephemeris ...	...	4.26.08
Longitude in time	...	5.33.17
in degrees	...	° ′ ″ 83.19.15

This was the instant of first appearance, as well as Lieutenant COLEBROOKE'S, who observed the same at *Vizianagarum* palace.

Lngitude by T. D. P.	...	° ′ ″ 83.10.15
by M.	...	83.19.15
Mean	...	83.14.45

MR. RUSSELL also made an observation, which I do not use, because he noted the time of full splendor, which is uncertain; it follows:

			h ′ ″
16th October, Watch fast at noon	...		1.43,5
gained daily		56″,5	
Add its gain to the observation	...		18,5
Watch fast ...	...		— 2.02
Time of full splendor	...		8.04.39
Time of observatoin	...		8.02.37
Ephemeris	...		2.29.17
Longitude in time	...		5.33.20
in degrees	...		° ′ ″ 83.20.00

BEEMULWILSA, 1784.

Observations by Lieutenant COLEBROOKE.

		h ′ ″		′ ″
⊙ On meridian, August 7th	...	23.40.23,15		
Equation of E. A.	...	+,60		
		23.40.23,75	slow ...	19.36,25
⊙ On meridian, August 12th	...	h ′ ″ 23.22.30,5		
Equation of E. A.	...	+ 0,75		
		23.22.31,25	slow ...	′ ″ 37.28,75
Loss in 5 days			...	17.52,50
Daily loss			...	3.34,05

An Immersion of Jupiter's *second Satellite.*

This was his first observation.

		h ′ ″
8th August, by watch immerged	...	12.33.20
Too slow at noon	...	19.36,25
Loss to the observation, at 214″,5	...	1.55,02
Immersion	...	12.54.51,45
Ephemeris	...	7.20.50
Longitude in time	...	5.34.01,45
		° ′ ″
in degrees	...	83.30.15,00

August 13th, by T. D. P.

Jupiter's first satellite vanished by the watch ... $11^h.32'.28''$
6 or 8 seconds before the time noted it had not changed colour: a cloud came on, and hid it for about 8 seconds, and when it was gone, the satellite have vanished.

August 20th, by T. D. P.

Jupiter's first satellite vanished by the watch ... $14^h.02'.30''$
The sky was clear, the glass steady: here I expected what happened, and was on my guard. The satellite vanished at a small distance from the body, *i. e.* before the contact, and without changing colour.

	Day.	h ′ ″		
⊙ On meridian, August	19th ...	23.57.13,25		
Equation of E. A.	...	+ 1,05		
	19th ...	23.57.14,75	slow ...	′ ″ 2.45,25

Immediately before this observation, the watch was set forward one hour without stopping it. By comparing this with the observation of the 12th, the watch lost daily, 3′.36″,6.

The foregoing observation of time is only of use for the erroneous immersions of the 13th and 20th.

	Day.	h ′ ″		
⊙ On meridian, August	27th ...	23.41.26,35		
Equation of E. A.	...	+ 2,1		
	27th ...	23.41.28,6	slow	′ ″ 18.31,4
	Day.	h ′ ″		
⊙ On meridian, August	29th ...	23.35.17,5		
Equation of E. A.	...	+ 2,4		
		23.35.19,9	slow	24.40,1

Daily loss ... 3′.04″,4

An Emersion of Jupiter's *first Satellite, by Lieutenant* COLEBROOKE.

			h ′ ″
29th August, by watch emerged	...	...	12.27.00
Too slow at noon after the observation	...		+ 24.40,1
Loss after the observation	...	...	— 1.25,5
Emersion		...	12.50.14,6
Ephemeris		...	7.16.33
Longitude in time		...	5.33.41,6
in degrees		...	° ′ ″ 83.25.16

Observations by T. D. P.

⊙ On the meridian, September 2 ...	$23^{h}.20'.47''$	
Equation of E. A. ...	+ 02,5	
	23.20.49,5	slow ... $39'.10'',5$
⊙ Altitude, 5th September $21^{h}.53'.55'',5$	$67^{\circ}.31'.35''$	
Refraction and parallax ...	— 20	
Collimation	+ 51	
	67.32.06	
⊙ Declination at the time and place	6.14.26	
Latitude ...	17.53.32	
From which data the time was	$22^{h}.41'.10'',0$	
By the watch ...	21.53.55,5	slow ... $47'.20'',5$
Whence the daily loss was ...	167″,7	

An Emersion of Jupiter's *first Satellite.*

The sky clear of clouds, and the glass steady, but the vapours had a perceptible motion through the telescope. The belts were very distinct.

5th September, by watch emerged	$14^{h}.00'.35''$
N. B. Full splendor $14^{h}.02'.15''$. Too slow at the altitude of the ⊙ taken after the observation ...	+ 47.20,5
Loss after the observation, at 167″,7	— 54,4
Emersion ...	14.47.01,1
Ephemeris ...	9.13.36
Longitude in time ...	5.33.25,1
in degrees ...	$83^{\circ}.21'.18''$

Observations by Lieutenant COLEBROOKE.

⊙ On the meridian, September 29th	$23^{h}.38'.27'',6$	
Equation of E. A. ...	+ 5,4	
	23.38.33,0	slow ... $21'.27'',0$
Equation of time ...	23.49.46,4	
		slow ... 11.13,4
⊙ On the meridian, October 1st ...	23.32.17,3	
Equation of E. A. ...	+ 5,7	
	23.32.23,0	slow ... $27'.37'',0$
Equation of time ...	23.49.08,6	
		slow ... 16.45,6

Daily loss on solar time ... 3′.05″,1

An Emersion of Jupiter's *first Satellite.*

			h ′ ″
30th September, by watch emerged	...	...	9.15.10
Too slow at noon	...	...	+21.27
Loss tlll observation, at 185″,1		...	+ 1.15
Emersion		...	9.37.52
Ephemeris		...	4.05.02
Longitude in time		...	5.32.50
in degrees		...	83°.12′.30″

I suspect that a mistake was committed in writing down the time, and that it ought to have been $9^h.16'.10''$. But this is as it is entered in the original book.

13th October, at 1′.48″ set the watch forward one hour without stopping it.

	h ′ ″		′ ″
⊙ On the meridian, October 15th	23.51.53,5		
Equation of E. A.	+ 6,8		
	23.52.00,3	slow	7.59,7
Equation of time	23.45.31,7	fast	6.28,6

The observation of the ⊙ passage over the meridian was not taken on the next day after the emersion as usual, and between the 17th and 18th the watch ran down, therefore the rate is ascertained from the mean time, compared with the 29th September, and 1st October.

And the watch lost by the 1st	...	173″,6 daily.
by the 2nd	...	174,7
Mean	...	174,2
Daily variation	...	+11,5
Daily loss on solar time	...	185,7

An Emersion of Jupiter's *first Satellite.*

			h ′ ″
16th October, by watch emerged	...	...	7.53.35
Too slow at noon ...		...	+7.59,7
Loss till observation at 185″,7			+1.01,9
Emersion		...	8.02.36,6
Ephemeris		...	2.29.17,0
Longitude in time		...	5.33.19,6
in degrees		...	83°.19′.54″

Result of the Observation of Longitude.

29th August,	COLEBROOKE	...	83°.25′.16″	83°.25′.16″
5th September,	PEARSE	...	83.21.18	83.21.18
30th do.	COLEBROOKE	...	82.12.30	rejected.
16th October,	COLEBROOKE	...	83.19.54	83.19.54
	Mean	...	83.19.44,5	83.22.09,3

VIZIANAGARUM PALACE.

An Observation of Jupiter's *second Satellite, by* T. D. P.

22d October, by watch emerged	... ...	h ′ ″ 7.16.06
Full splendor	...	18.18

Observations by Lieutenant COLEBROOKE.

		Equal Altitudes.	
* *Fumulhoot* rising	...	h ′ ″ 7.48.10	
falling	...	9.44.25	
* On the meridian	...	8.46.17,5	
By calculation	...	8.54.35,5 slow ...	′ ″ 8.18
⊙ On the meridian, 22d	...	h ′ ″ 23.50.14,5	
Equation of E. A.	...	+ 7,0	
		23.50.21,5 slow ...	′ ″ 9.38.5
23d October, * *Fumulhoot* rising	...	h ′ ″ 7.51.39	
falling	...	9.29.05	
* On the meridian	...	8.40.22	
By calculation	...	8.50.46,2 slow ...	′ ″ 10.24,2
⊙ On the meridian, 23d	...	h ′ ″ 23.48.10,3	
Equation of E. A.	...	+ 7,6	
		23.48.17,3 slow ...	′ ″ 11.42,7

From the above, daily loss ... 125″,2

An Emersion of Jupiter's *first Satellite.*

By watch emerged	...	h ′ ″ 9.48.55
22d October, *Jupiter's* second Satellite emerged	...	7.16.06
By *Fumulhoot*, watch slow ...	...	+ 8.18
Loss in 1h.30′ after emersion, at 125″,2	...	— 07,8
Emersion	...	7.24.16,2
Ephemeris	...	1.49.57
Longitude in time ...	...	5.34.19,2
in degrees ...	...	° ′ ″ 83.34.48,0

23d October, *Jupiter's* first Satellite emerged	...	h ′ ″ 9.48.55
By *Fumulhoot* too slow ...	...	+ 10.24,6
Loss in 1h.8′ after *Fumulhoot* passed at 125″,2		+ 06,0
Emersion	...	9.59.25,6
Ephemeris	...	4.26.08,0
Longitude in time ...	...	5.33.17,6
in degrees ...	...	° ′ ″ 83.19.54,0

MR. MAXTON observed this at *Vizacpatam*, and the two observations shew only 39″ difference of longitude; but the high hill that lies to the north of the palace bore from *Beemulwilsa*, N. 8°.25′ E. and by trigonometry its distance was 22,978 miles; therefore it lay north of *Beemulwilsa* 19'.28" and east 2'.52". The palace lies 12'.20",3 to the north by observations at large, and therefore to the east 1'.48". But *Beemulwilsa* lies to the east of *Vizacpatam*. MR. MAXTON'S eye, it may be presumed, is not so quick as Lieutenant COLEBROOKE'S, and will suffice to account for the difference; for, by a particular survey round these parts, *Vizianagur* fort does lie 6'.36" east of *Vizacpatam*.

NARRAINPOOR.

Which, by the table of the route, lies west of *Vizianagarum* palace 2'.

Observations by Lieutenant COLEBROOKE *for Time.*

⊙ On the meridian October 31st ...	h ' " 23.36.04,3		
Equation	+ 6,4		
	23.36.10,7	slow ...	' " 23.49,3
November 1st	23.34.39,5		
Equation	+ 6,8		
	23.34.46,3	slow ...	25.13,7
		Daily loss ...	1.24,4

An Observation of Jupiter's *first Satellite.*

Sky remarkably clear, and glass steady.

31st October, emerged by watch		h ' " 6.00.45
Too slow at noon		23.49,3
Loss till observation at 84",4 ...		22,5
	Emersion ...	6.24.56,8
	Ephemeris ...	51.26
	Longitude in time ...	5.33.30,8
	in degrees ...	° ' " 83.22.42,0

KALINGAPATAM, 1784.

Observations by Lieutenant COLEBROOKE *for Time.*

⊙ On meridian, November 7th ...	h ' " 23.50.56,5		
Equation of E. A. ...	+ 6,8		
	23.51.03,3	slow ...	' " 8.56,7
β Cassiopææ on the meridian ...	8.49.48		
By calculation ...	9.00.01,6	slow ...	10.13,6

Therefore the watch lost 1'.16",9 in 9 hours, and 205",06 daily.

N. B. The watch had run down on the 5th, and the weather was changing from dry to cloudy, which ended in rain.

For Longitude.

An Emersion of Jupiter's *first Satellite.*

Glass steady, atmosphere rather thick

				h ' "
By watch emerged	...	...	...	8.13.35
Too slow by the star	...	...	...	+10.13,6
The star passed after the emersion 36'; loss for that time				— 5,1
Emersion	...		...	8.23.43,5
Ephemeris	...		...	2.47.01,0
Longitude in time	...		...	5.36.42,5
in degrees			...	84.10.37,5

IECHAPOORE, 1782.

Observations by T. D. P.

Double altitudes of *Jupiter*, with the octant and artificial horizon.

Time.		*Angles.*		
h ' "		° ' "		h ' "
8.10.03	—	64.28.10	*Jupiter's* R. A. at the time	17.21.46,6
13.03	—	63.30.00		
			Declination ...	23.02.04S.
15.08	—	62.45.20		
			⊙ R. A. at the time ...	11.55.08,2
18.53	—	61.50.30		
			Latitude by COLEBROOKE 1784, see Table.	
8.14.17 Mean		31.34.15		
			See observations at large ...	19.06.45
Ref.	—	1.34		
		31.32.41		

From the above data, *Jupiter* had passed the meridian

h ' " 2.45.59,2, and the time was	...	h ' " 8.12.37,6
Watch	...	8.14.17
Too fast ...		1.39,4

An Eclipse of the Moon.

21st September	...	h ' " 7.00.15	doubtful.
		01.40	begun certainly.
		02.40	strong shadow came on.
		04.14	Penumbra touched a place which I name A.
		09.03	shadow touched A.
		9.06.56	shadow touched the limb at B.
		08.11	Penumbra going.
		10.12	limb not perfectly bright.
		11.20	end certainly, and at B.

By comparison of the observations at A, it appears that the shadow required 4'.49" to move through the breadth of the penumbra. By comparing those at B, it appears that 4'.24" were then sufficient.

The mean of these will be very near the truth ; it is 4′.37″.

		h ′ ″
Shadow came on	...	7.02.40
Advance of penumbra	...	04.37
Beginning of eclipse	...	6.58.03
Shadow touched the limb	...	9.06.56
Retreat of penumbra	...	+04.37
End of eclipse	...	9.11.33
Duration observed	...	2.13.30
Duration by ephemeris	...	2.08.30
		+05.00
By ephemeris end	...	3.28
Beginning	...	1.19.30
Duration	...	2.08.30
Ephemeris middle	...	2.23.45
Middle observed by watch	...	8.04.48
Too fast	...	1.39,4
		8.03.08,6
Ephemeris	...	2.23.45
Longitude in time	...	5.39.23,6
in degrees	...	84°.50′.54″

GANJAM FORT, 1782.

Observations by T. D. P. *Latitude determined.*

		h ′ ″
4th September, horizon clear, octant	... ...	19.21.30
6th, Very hazy, by sextant, and quadrant, both agreed		19.21.03
16th	Sextant	19.21.50
	Octant	19.19.50
	Mean	19.21.03

These were taken from the top of the Chief's house, the sea was the horizon ; the height above the area of the fort was measured, but the height of that area was guessed at ; the dip was taken corresponding to this height from the tables.

An Observation of Jupiter's *fourth Satellite.*

		h ′ ″
16th September 1782, immersion	... ...	6.45.27
The change of colour was noted at	...	6.44.04

Clouds prevented the observing of the emersion of this, and the immersion of the first, which happened that night.

GANJAM CAMP, 1784.

Observations by Lieutenant COLEBROOKE.

		h ′ ″		′ ″
⊙ On the meridian, November 20th	...	23.57.36,3		
Equation of E. A.		+ 05,5		
		23.57.41,8	slow ...	2.18,2
⊙ On the meridian, 21st	...	23.56.00		
Equation of E. A.	...	+ 05,5		
		23.56.05,5	slow ...	3.54,5
⊙ On the meridian, 22d	...	23.54.15,0		
Equation of E. A.	...	05,4		
		23.54.20,4	slow ...	5.59,6

* ε *Cassiopææ*, 24th November.

	First Wire.	*Middle.*	*Upper.*		
	h ′ ″	′ ″	′ ″		
Rising ...	7.28.20	34.40	42.40		
Falling ...	9.35.53	29.35	21.37		
On the meridian ...	8.32.06,5	32.07,5	32.08,5	=	h ′ ″ 8.32.07,5
		By calculation ...			8.39.51,2
		Slow ...			7.43,7

Which compared with the last solar observation, gives 91″,3 daily loss.

An Emersion of Jupiter's *first Satellite.*

		h ′ ″
24th November, by watch emerged ...	...	6.37.35
Too slow by the star ...	...	+ 7.43,7
Loss after the emersion, at 91″,3,	...	7,3
Emersion ...	...	6.45.11,4
Ephemeris	...	1.04.39
Longitude in time	...	5.40.32,4
in degrees ...		° ′ ″ 86.08.06

JEHAUDJEPOOR, 1784.

Observations by Lieutenant COLEBROOKE.

	Middle.	*Upper.*		
	h ′ ″	′ ″		
17th December, * ε *Cassiopææ* rising ...	6.31.40	42,03		
falling ...	8.05.53	55,31		
* On the meridian ...	7.18.46,5	18,47	=	h ′ ″ 7.18.46,7
By calculation ...				7.54.48,7
Watch slow ...				36.02,0

	h ′ ″		
⊙ On the meridian, 17th ...	23.23.59,3		
Equation of E. A. ...	+ 1		
... ...	23.24,00	slow ...	′ ″ 36.00

An Emersion of Jupiter's *first Satellite.*

			h ′ ″
By watch emerged ...	...	...	6.21.25
Too slow by the *	...	...	36.02
Emersion	...	...	6.57.27
Ephemeris	...	...	1.11.50
Longitude in time	...	...	5.45.37
in degrees	...	...	° ′ ″ 86.24.15

SOOBUNREEKA RIVER CAMP, 1784.

Observations by Lieutenant COLEBROOKE.

N. B. Opposite Jellasore, *on the* Ballasore *side of the river.*

	h ′ ″		
⊙ On the meridian, December 24th ...	23.19.34,1		
Equation of E. A. ...	— 7		
	23.19.33,4	slow ...	′ ″ 40.26,6
⊙ On the meridian, December 25th ...	23.18.12		
Equation of E. A. ...	— 1		
	23.18.11	slow ...	41.49,0
Daily loss ... 82″,4			

15

An Emersion of Jupiter's *first Satellite.*

17th December, by watch emerged ...	...	h ′ ″ 8.12.42
Full splendor.	Too slow at the following noon	40.26,2
h ′ ″ 8.13.50	Loss after emersion, at ″82, 4	— 52
	Emersion ...	8.52.16,2
	Ephemeris ...	3.04.14
	Longitude in time ...	5.48.02,2
	in degrees ...	° ′ ″ 87.00.33,0

An Emersion of Jupiter's *second Satellite.*

25th December, by watch emerged ...	...	h ′ ″ 6.04.40
	Watch slow ...	+ 40.26,6
	Loss till observation, at 82″,4	+ 23,2
	Emersion ...	6.45.29,8
	Ephemeris ...	— 55.57
	Longitude in time ...	5.49.32,8
	in degrees ...	° ′ ″ 87.23.12

A Comparison of the Observations for Longitudes with corresponding Observations at different Places, to fix the Longitudes of those which were undetermined.

By T. D. PEARSE.

CALCUTTA.

The observatory was at the Treasury Gate in *Fort William.*

Lunar Eclipses.

1776, July 30th, Immersion at *Calcutta* ...	h ′ ″ 17.01.16	
Greenwich	11.08.21	h ′ ″ 5.52.55

As this was not of the best, I reject it.

1779, November 23d, I reject the beginning, because when compared with *Tycho* in the former part, it appears, from a like comparison of the *Greenwich* observations, that it is erroneous a full minute. The first *Copernicus* is also rejected. And by comparing the end doubtful with *Tycho* and *Copernicus* of the latter part in both sets, it appears to be the observation that must be compared with the end at *Greenwich.*

	Calcutta.	Greenwich.	Longitude.
	h ′ ″	h ′ ″	h ′ ″
The body of Tycho touched	12.35.30	6.42.29	5.53.01,0
passed	36.53	43.36	17,0
Immersion	13.01.41,3	7.08.08	33,3
Emersion	14.40.13,3	8.46.23	50,3
Grimaldi touched	43.06,3	49.45	21,3
The middle of Copernicus	15.02.44,1	9.08.59,5	44,6
The body of Tycho touched	04.56	11.39	17,0
passed	06.23	12.49	34,0
The end	15.39.45,6	9.46.09	36,6
	Mean, in time		5.53.28,3
	in degrees		° ′ ″ 88.22.04,5

Jupiter's *Satellites.*

From the beginning in 1774, till the 27th December 1777, the observations were made with a middling 18 inch reflector. I allow 24″ to compare it with the large reflector at *Greenwich*, and 12″ for their refractor. The comparison is of actual corresponding observations, except in two cases, in which the *Calcutta* observations are one revolution later. The Longitudes of *Paris* and *Stockholm* are taken from WARGENTIN, Phil. Trans. vol. 67. LUNDEN, from thirty-three corresponding observations found in that same paper. Of *Chislehurst*, from WOLLASTON, vol. 74. Of *Geneva*, *Oxford*, and *Marseilles*, from PIGOT, vol. 68 and 76. *Nagpoore* and *Chunargur* were communicated to me by Lieutenant EWART, of the *Bengal* establishment, who observed at each place a considerable time.

Date.	Place.	Time.	Correction for Longitude or Glass.	Times correct.	Longitude. In Time.	Longitude. In Degrees.
		h ′ ″	h ′ ″	h ′ ″	h ′ ″	° ′ ″
1774, October 14th.	Calcutta,	12.32.25	1st. Sat. Im. +24	12.32.49		
	Stockholm,	07.52.00	—1.12.21	6.39.39		
					5.53.10,0	
21st.	Greenwich,	° ′ ″	1st. Sat. Im.	8.35.00		
	Paris,	8.44.47	— 09.25	22		
	Geneva,	8.59.20	— 24.05	15		
	Oxford,	8.30.26	+ 4.59	25		
		Immersion,	Mean,	8.35.15,5		
			Add one Revolution 1,	18.28.49		
			Day 23d,	3.04.45		
23d.	Calcutta,	8.57.15	1st. Sat. Im. + 24″	8.57.39		
					5.53.34,5	
December 31st.	Calcutta,	11.25.47	— 24″ Em.	11.25.23		
	Lunden,	6.25.05	—52.55	5.32.10		
					5.53.13,0	
1776, November 11th.	Greenwich,	1st. Sat. Im.	N. B. Refractor,	13.37.32		
			Add one Revolution 1,	18.28.06		
			Day, 13th,	8.05.38		
13th.	Calcutta,	13.58.56,3	1st. Sat. Im. + 12″	13.59.08,3		
					5.53.30,3	
17th.	Calcutta,	15.31.51,3	3d. Sät. Im. + 12	15.32.03,3		
	Chislehurst,	9.38.48,5	— 19	9.38.29,5		
					5.53.33,8	
December 18th.	Calcutta,	15.58.21	2d. Sat. Im.	15.58.21		
	Marseilles,	10.25.54	—21.25	10.04.29		
					5.53.52,0	
			Mean by Jupiter's Satellite,		5.53.29	
			By Lunar Eclipses, ...		5.53.28	
			Result—Longitude of Calcutta. ...		5.53.28,5	88.22.07,5

Date.	Place.	Time.	Correction for Longitude or Glass.	Times correct.	Longitude. In Time.	Longitude. In Degrees.
		A Lunar	Eclipse.	h ′ ″	h ′ ″	° ′ ″
1782, September 21st.	Ichapoore,	The shadow	touched the limb.	9.05.16,6		
		h ′ ″	h ′ ″			
	Nagpoore,	8.44.22	— 5.18.46	3.25.36		
		Jupiter's	Satellites.		5.39.40,6	84.55.09,0
October 9th.	Kossim Kotta,	1st. Sat. E.		7.09.48		
	Nagpoore,	6.56.43	— 5.18.46	1.37.57		
					5.31.51,0	82.57.45
1784, September 5th.	York,	9.08.54	+ 4.31	9.13.25		
	Greenwich,		Refractor,	15		
			+ glass, 13			
	Paris,	9.22.18	— 9.25	06		
			1st. Sat. E. Mean,	9.13.15,5		
	Beemulwilsa,	14.47.01,1	— 12	14.46.49,1		
					5.33.34,0	83.23.30,0
				8.23.43,5		
November 8th.	Kalingapatam,		1st. Sat. E.	2.47.09		
	Chunargur,	8.19.45	—5.32.26		5.36.34,5	84.08.37,0

OBSERVATIONS *at large for determining the Latitudes of* PLACES.

Phænomenon and Face of the Quadrant.	*Date.*	ARCH OF 96. *Reading.*	ARCH OF 96. *Value.*	*Arch of 90.*	*Refraction or Equation applied.*	*Zenith Distance corrected.*	*Declination.*	*Latitude by the observation.*	*Name of the Place and its correct Latitude.*
	1783.	D.SD.N.	° ′ ″	° ′ ″	″	° ′ ″	° ′ ″	° ′ ″	
α Aquilæ, E.	Oct. 9th,	4. 3.28,3	4.39.36,2	4.40.00	4,3	4.39.52,4	8.18.24,7N.	12.58.17,1	Viperee.
W.	11th,	6.–3.01,5	4.54.39,2	4.55.00	5	4.54.54,2		13.13.18,9	
E.	12th,	4. 3.28	4.39.29,6	4.40.00	4,3	4.39.49,1		12.58.13,8	
α Cygni, W.	9th,	33. 1.20,5	31.19.19,3	31.19.10	35,3	31.19.50	44.30.53,8N.	13.11.03,8	
W.	11th,	33. 1.18,5	31.18.26,5	31.18.30	35,3	31.19.03,6		13.11.50,2	
Fumulhoot, E.	11th,	46. 2.18	43.43.32	43.44.00	54,5	43.44.40,5	30.45,43 S.	12.58.57,5	
α Pegasi, E.	11th,	2.–3.12	1. 5.02,4	1. 5.00	1	1. 5.02,2	14. 2.42,8N.	12.57.40,6	
W.	11th,	0. 3.21	0.51.11,3	0.51.30,0	0,8	0.51.21,5		13.11.21,3	
4 Stars, E.								12.58.17,2	Viperee,
4 Stars, W.								13.11.53,5	° ′ ″ 13.05.05,35
Algenib, E.	Nov.	1. 0.00	0.56.15	0.57.00	0,9	0.56.38,4	13.58.34,7N.	13. 1.56,4	Trivatore,
W.	21st.	0. 3.00	0.42.11,3	0.42.30	0,7	0.42.21,3		13.16.13,3	° ′ ″
Pole at 10 P.		79. 3.16	74.53.18	74.53.30	210,0 +	75.00.12,2	88. 9.08	13.08.55,8	13. 9.00,4
				Collim.	428,0 —				
	1784. April		Below the Pole,		228,0				
α Leonis, E.	23d.	0. 1.04	0.15.49,2	0.15.55	0	0.15.55,3	13.00.53 N.	13.16.45	North side of Cortelare river,
α Urs. Maj. W.		52. 3.29	49.39.56	49.40.40	67,0	49.41.25	62.54.43 N.	13.13.18	° ′ ″ 13.15.01,5
α Leonis, W.	25th,	0. 2.09	0.32.05	0.32.40	0,5	0.30.43	13.00.53 N.	13.31.34	Arambaukum,
				Collim.	— 102				° ′ ″ 13.31.36
α Urs. Maj. W.	26th,	52. 1.29	49.11.48,4	49.12.20	67,0	49.13.11,2	62.54.43 N.	13.41.32,2	Akamapett,
α Virginis, E.		25. 1.01	23.40.45	23.41.00	25	23.41.17,5	10. 1.46 S.	13.39.31,5	° ′ ″ 13.40.32
α Leonis, W.	27th,	0. 3.10,5	0.46.48	0.47.00	0,8	0.46.54,8	13. 0.53 N.	13.47.47,8	Akarumpauk,
γ Leonis, W.		7. 2.14	7. 8.01,6	7. 7.20	7	7. 7.48,8	20.55.38 N.	13.47,50	° ′ ″ 13.47.49
γ Leonis, W.	28th,	7. 1.20	6.56.36	6.57. 0	7	6.56.55		13.40.43	Nayrpett,
α Virginis, E.		25.20.01	23.54.49	23.55.00	25	23.55.19	10. 1.46 S.	13.53.33	° ′ ″ 13.56.08
α Urs. Maj. W.	29th,	52. 0.12,5	48.50.29,6	48.50.50	65	48.51.45	62.54.43 N.	14. 2.58	Korware,
α Virginis, E.		25. 2.25	24. 5.22	24. 5.50	25	24. 6.01	10. 1.46 S.	14. 4.15	° ′ ″
γ Leonis, W.	30th,	7. 1. 3	6.49.07,2	6.49.10	6,5	6.49.15	20.55.38 N.	14. 6.23	14. 5.12,6
α Urs. Maj. W.		52. 0. 9	48.48.57	48.49.40	65	48.50.23	62.54.43 N.	14. 4.20	
α Virginis, E.		25. 2.23	24. 4.29	24. 5.10	25	24. 5.15	10. 1.46 S.	14. 3.29	Vincateechillum,
α Urs. Maj. W.	May	51. 3.04	48.32.42	48.32.00	64	48.33.25	62.54.43 N.	14.21.18	° ′ ″
α Virginis, E.	1st.	25. 3.26	24.19.52	24.20.00	26	24.20.22	10. 1.46	14.18.36	14.19.57

OBSERVATIONS *at large for determining the Latitudes of* PLACES.

Phænomenon and Face of the Quadrant.	*Date.*	ARCH OF 96. *Reading.*	ARCH OF 96. *Value.*	*Arch of 90.*	*Equation applied.*	*Zenith Distance corrected.*	*Declination.*	*Latitude by the observation.*	*Name of the Place and its correct Latitude.*
	1784.	D. SD.N.	° ′ ″	° ′ ″	″	° ′ ″	° ′ ″	° ′ ″	
δ Urs. Maj. W.	May	46. 2.17	43.43.06	43.44.00	54	43.44.27	58.13.58 N.	14.29.31	Pinnare River,
ζ Urs. Maj. W.	3d,	44. 1.10	41.43.27,4	41.33.10	50,3	41.34.09	56. 3.23 N.	14.29.14	North Bank,
α Virginis, E.		26. 0.15	24.29.05,5	24.29.10	26	24.29.33,7	10. 1.46 S.	14.27.47,7	° ′ ″ 14.28.35
α Virginis, E.	10th,	26. 2.22	25.00.17,6	25.00.40	26,2	25.00.55		14.59.09	Ollore*,
ζ Urs. Maj. W.		44. 1.20	41.37.51	41.37.20	49	41.38.24,5	56. 3.23 N.	14.24.58,5	° ′ ″ 14.42.03,8
δ Urs. Maj. W.	12th,	46. 0.22	43.17.10	43.17.10	53	43.18.03	58.13.58 N.	14.55.55	Mooaumillodooro,
α Virginis, E.		26. 1.28	24.48.52	24.48.50	25	24.49.16	10. 1.48 S.	14.47.28	
ζ Urs. Maj. W.		43. 3.15	41. 7.32	41. 8.10	44	41. 8.35	56. 3.23 N.	14.54.48	
α Virginis, E.	13th,	26. 1.30	24.49.48,5	24.50.00	25	24.50.19,3	10. 1.48 S.	14.48.31,3	° ′ ″
ζ Urs. Maj. W.		43. 3.14	41. 7.05,5	41. 7.10	44	41. 7.51,7	56. 3.23 N.	14.55.31,3	14.51.42,1
δ Urs. Maj. W.	19th,	45. 2.07	42.42.27,1	42.42.10	53	42.43.11,5	58.13.58 N.	15.30.46,5	Ongle, properly
ε Urs. Maj. W.		44. 1.17	41.36.32	41.36.00	50	41.37.06	57. 8.02,5N.	15.30.56,5	Wungole,
α Virginis, E.		27. 0.22	25.28.25	25.29.00	27	25.29.09,5	10. 1.48 S.	15.27.21,5	° ′ ″
ζ Urs. Maj. W.		43. 0.27	40.30.37	40.30.30	49	40.31.22,5	56. 3.23 N.	15.32.00,5	15.29.18,2
α Virginis, E.	20th,	27. 1.05	25.35.01	25.35.00	27	25.35.27,5	10. 1.48 S.	15.33.39,5	Chicoortee,
ζ Urs. Maj. W.		43. 0.17	40.26.13	40.26.05	49	40.26.58	56. 3.23 N.	15.36.25	° ′ ″ 15.35.44,5
α Virginis, E.	22d,	27. 1.05	25.35.01	25.35.00	27	25.35.27,5	10. 1.48 S.	15.33.39,5	Yenmunbender,
ζ Urs. Maj. W.		43. 0.13	40.24.29	40.25.00	49	40.25.33,4	56. 3.23 N.	15.37.49,6	° ′ ″ 15.46.27,5
κ Urs. Maj. W.	23d,	36. 3.15	34.33.37	34.33.50	39	34.34.22,5	50.23.42 N.	15.49.09	Vantipollam,
α Libræ, E.		32. 3.21	30.51.25	30.51.05	34	30.51.49	15. 8.03 S.	15.43.46	° ′ ″ 15.46.27,5
α Virginis, E.	25th,	27. 2.15	25.53.28	25.54.00	28	25.54.12	10. 1.48 S.	15.52.24	Baupetla,
ζ Urs. Maj. W.		42. 3. 3	40. 6.00	40. 5.50	48	40. 6.43	56. 3.23 N.	15.56.40	° ′ ″ 15.54.32

LIEUTENANT COLEBROOKE had by this time acquired the art of using the quadrant, and his observations will appear where I did not take any. The next is his, and where his are substituted, they will be marked C, He did observe Chicoortee, the result I had entered in my book, it was 15°. 34′. 10″ but his observation was lost.

κ Urs. Maj. W.	26th,	36. 2.16	34.20.09,4	34.20.00	39	34.20.43,7	50.23,42 N.	16.02.58,3	Chundole,
α Libræ, E.		33. 0.20	31. 5.02	31. 5.00	34	31. 5.35	15. 8.03 S.	15.57.32	° ′ ″ 16. 0.15,2 C,
κ Urs. Maj. W.	28th,	36. 1.22	34. 8.44	35. 8.05	38	34. 9.02,5	50.23.42 N.	16.14.39,5	Sicacollum, on the North Bank of the Kistna,
α Libræ, E.		33. 1.15	31.16.54	31.17.00	34	31.17.31	15. 8.03 S.	16. 9.28	° ′ ″ 16.12.04,3

* The quadrant was pulled to pieces at Pinnare Camp, and the line of collimation had not been adj usted ; it was performed before it was next used.

OBSERVATIONS *at large for determining the Latitudes of* PLACES.

Phænomenon and Face of the Quadrant.	*Date.*	ARCH OF 96. *Reading.*	ARCH OF 96. *Value.*	*Arch of 90.*	*Equation applied.*	*Zenith Distance corrected.*	*Declination.*	*Latitude by the observation.*	*Name of the place and its correct Latitude.*
	1784,	D.SD.N.	° ′ ″	° ′ ″	′ ″	° ′ ″	° ′ ″	° ′ ″	
ε Urs. Maj. W.	May 29th,	43. 1.18	40.40.43	40.39.55	49	40.41.08	57. 8.02,5N.	16.26.54,5	Moodenoore,
α Virginis, E.		28. 0.21	26.24.14	26.23.30	29	26.24.21	10. 1.48 S.	16.22.33	° ′ ″ 16.24.38,8 C.
α Virginis, E.	June	28. 1.28	26.41.22	26.42.00	29	26.42.10		16.40.22	Ellore,
ζ Urs. Maj. W.	1st.	41. 3.22	39.18.16	39.18.10	48	39.19.10	56. 3.25 N.	16.44.13	16.42.17,5 P.
ε Urs. Maj. W.		43. 0.08	40.22.15,9	40.22.20	49	40.23.07	57. 8.02,5N.	16.44.55,5	
η Urs Maj. W.		35. 3.17	33.38.24,5	33.38.40	37,7	33.39.10	50.23.42 N.	16.44.32	
α Libræ, E.		33. 3.22	31.48.06,3	31.48.10	35	31.48.43,2	15. 8.04 S.	16.40.39,2	° ′ ″ 16.42.41,5 C.
⊙ Up. L. W.	4th,	5. 2.20	5.18.10	5.18.40	5,0	5.34.18	22.32.32 N.	16.58.14P.	Soolaurum,
				Semedia.	+ 15.49				
				Parallax,	1,0				
α Virginis, E.		28. 2.28	26.55.26	26.55.20	29	26.55.52	10. 1.48 S.	16.54.04C.	° ′ ″ 16.56.08,5
α Virginis, E.	12th,	28. 3.02	26.58.04	26.57.05	29	26.58.03,5		16.56.15,5	Rajahmundree,
ζ Urs. Maj. W.		41. 2.15,5	39. 1.11,2	39. 1.20	46	39. 2.01,6	56. 3.23 N.	17. 1.12,4	° ′ ″ 16.58.43,6 P.
x Urs. Maj. W.	12th,	35. 2.09	33.20.50	33.21.00	36	33.21.31	50.23.42 N.	17. 2.11	
α Libræ, E.		34. 0.23	32. 2.44	32. 2.40	35	32. 3.17	15. 8.04 S.	16.55.13	16.58.42 C,
x Urs. Maj. W.	13th,	35. 1.29	33.15.33	33.15.00	35,5	33.15.52	50.23.42 N.	17. 7.50	Rajahnagur,
β Libræ, E.		27. 1.07	25.35.53	25.35.00	27	25.35.53	8.34.33 S.	17. 1.20	° ′ ″ 7. 4.35 C.
x Urs. Maj. W.	14th,	35. 1.29	33.15.33,5	33.15.55	37	33.16.21	50.23.42 N.	17. 7.21	Peddapore,
α Draconis, W.		51. 2.00	48.16.52,5	48.16.10	62,7	48.17.34	65.24.36 N.	17. 7.02	
α Libræ, E.		34. 1.18	32.10.05	32. 9.30	34,5	32.10.22	15. 8.04 S.	17. 2.18	
β Libræ, E.		27. 1.07	25.35.53,3	25.34.40	25,4	25.36.12	8.34.33 S.	17. 1.39	° ′ ″ 17. 4.35 P.
β Scorpii, E,	18th,	38. 2.20	36.14.25	26.13.40	41,5	36.14.44	19.12.01,6 S.	17. 2.42	
γ Draconis, W.		36. 2.24	34.23.40	34.24.00	39,0	34.24.29	51.31.18 N.	17. 6.49	17. 4.45,5 C.
α Virginis, E.	20th,	28. 3.27	27. 8.59,7	27. 8.30	29,0	27. 9.13,7	10. 1.48 S.	17. 7.26	Gooloopool-
β Libræ, E.		27. 1.19	25.41.09,7	25.41.30	28,0	25.41.48	8.34.33 S.	17. 7.15	loore,
ζ Urs. Maj. W.		41. 1.30	38.53.30	38.53.20	44,0	38.54.09	56. 3.33 N.	17. 9.05	
x Urs. Maj. W.		35. 1.23	33.12.55,2	33.12.50	37	33.13.15	50.23.42 N.	17.10.27	° ′ ″ 17. 8.33,5 C.
x Urs. Maj. W.	21st.	35. 1.16	33. 9.50,6	33. 9.20	37	33.10.12	50.23.42 N.	17.13.30	Tonding and Matoor,
α Libræ, E.		34. 1.39	32.19.18	32.20.00	35	32.20.14	58.18.04 S.	17.12.10	° ′ ″ 17.12.45 C.
β Libræ, E.	22d,	27. 2.10	25.51.16	25.50.20	28	25.53.06	8.34.33 S.	17.18.33	Suteawaurum,
			From 18th to 20th June		+ 1.50				° ′ ″ 17,18.33 C.
α Coronæ Borealis, W.	24th,	10. 2.02	9.51.30	9.50.40	10	9.51.15	27.27.03,5N.	17.35.48,5	Ellmuchillee,
β Scorpii, E.		39. 0.19	36.42.06	36.41.50	43	36.42.41	19.12.01,6 S.	17.30.39,4	° ′ ″ 17.33.14 C.

OBSERVATIONS *at large for determining the Latitudes of* PLACES.

Phænomenon and Face of the Quadrant.	*Date.*	ARCH OF 96. *Reading.*	ARCH OF 96. *Value.*	*Arch of 90.*	*Equation applied.*	*Zenith Distance corrected.*	*Declination.*	*Latitude by the observation.*	*Name of the place and its correct Latitude.*
	1784.	D. SD. N.	° ′ ″	° ′ ″	′ ″	° ′ ″	° ′ ″	° ′ ″	
α Coronæ Borealis, W.	June 27th,	10. 1.08	9.40.04,7	9.39.40	9,6	9.40.02	27.27.03,5N.	17.47.01,5	Sobaurum,
β Scorpii, E.	July 9th,	39. 1.23,5	36.58.08,4	36.57.20	43	36.58.27,2	19.12.02 S.	17.46.25,2	° ′ ″ 17.46.59,2 C.
α Scorpii, E.	12th,	46. 2.11	43.40.27,6	43.41.00	55	43.41.39	25.56.12 S.	17.45.27	These were made with difficulty amongst clouds and winds, but they were all that could be had.
⊙ Up. L. W.		5.04.12	3.50.16,4	3.50.00	+ 3,6	4. 5.59	27.55.02 N.	17.49.03	
				Ref. & Par. Semedia	+ 15.47				
α Lyræ, W.	Sept.	22.00.29	29.50.14	20.40.40	33	20.50.30	38.35.26,3 N.	17.44.56,3	Vizacpatam,
β Lyræ, W.	8th,	16.01.20	15.22.51	15.22.10	15	15.22.45,5	33.07.16 N.	17.44.30,5	
α Aquilæ, E.		9.03.27	9.20.18,2	9.20.00	9	9.20.18,1	8.18.32,5 N.	17.38.50,6	° ′ ″
β Aquilæ, E.		12.02.05,5	11.45.33	11.45.10	12	11.45.34	5.53.08,3N.	17.38.42,3	17.41.45 Beemulwilsa
α Coronæ Borealis, W.	July 14th,	10. 0.16	9.29.32	9.28.50	9,5	9.29.20,5	27.27.03,5N.	17.57.43,0	Camp A clear night,
γ Draconis, W.		35. 3.07	33.34.01	33.33.10	37,5	33.34.13	51.31.18 N.	17.57.05	° ′ ″
α Scorpii, E.		39. 2.03	37. 3.11	37. 2.40	43	37. 3.38,5	19.12.02 S.	17.51.36,5	17.54.15 C.
β Scorpii, E.		46. 2.23	43.45.44	43.46.00	55	43.46.47	25.56.12 S.	17.50.35	Simachillum,
β Libræ, E.		28. 0.08	26.18.31	26.19.00	20,5	26.19.14	8.34.33 S.	17.44.41	
α Coronæ Borealis, W.	8th,	10. 1.05,5	9.38.59	9.38.40	9,5	9.38.59,0	27.27.03,5 N.	17.48.04,5	° ′ ″ 17.46.28,8 C.

The four following Observations were taken by a quadrant made by RAMSDEN, eighteen inches radius, which shewed Altitudes.

α Lyræ, W.	Aug.	73. 3.10	69.17.13,6	69.17.35	—22	69.17.02,3	38.35.26,1N.	17.52.28,4	Beemulwilsa,
β Lyræ, W.	29th,	79.03.00,9	74.45.47,3	74.46. 0	—15,6	74.45.38	33.07.16 N.	17.52.54,0	Head Quarters,
α Aquilæ*, E.		85.03. 2	80.24.24	80.24.50	—10	80.24.27	8.18.32 N.	17.54. 5	° ′ ″
β Aquilæ†, E.		83.00.12	77.58.32	77.58.47	—12	77.58.28	5.53.08 N.	17.54.40	17.53.32 P.
α Draconis, W.	8th,	35.03.11	33.35.46,3	33.35.00	38	33.36.01	51.31.18 N.	17.55.17	
α Lyræ, W.		22.00.04	20.39.16	20.38.30	20	20.39.13	38.35.26 N.	17.56.13	
α Lyræ, W.	9th,	22.00.05	20.39.42	20.39.00	20	29.39.41		17.55.45	
ε Sagittarii, E.		55.03.08	52.19.27,3	52.18.50	75	52.20.18,6	34.27.59,5 S.	17.52.29	
α Aquilæ, E.	28th,	10.00.23,5	9.32.50	9.33.00	10	9.33.05	8.18.32,5N.	17.51.37,5	
ε Sagittarii, E.	31st,	55.03.07	52.19.01	52.18.40	75	52.20.06	34.27.59,5 S.	17.52.06,5	
α Lyræ, W.		22.00.06	20.40.09	20.39.30	20	20.40.15	38.35.26 N.	17.55.11	Head Quarters, Cantonments at Beemulwilsa,
α Cygni, W.	Sept.	28.01.13	26.34.46,6	26.35.00	29	26.35.22	44.31.05,3N.	17.55.43,3	The Mean, ... ° ′ ″ 17.53.51 C.
β Aquarii, E.	3d,	25.03.30	24.21.37,3	24.22.00	25	24.22.14	6.30.33 S.	17.51.41	
α Cephei, W.	27th,	46.02.22	43.45.17,3	43.45.00	55	43.46.04	61.40.42 N.	17.54.38	
β Aquarii, E.		26.00.00	24.20.30	24.22.20	25	24.22.50	6.30.33 S.	17.52.17	
6 North Stars,								17.55.28	
6 South Stars,								17.52.14	

* From the reading of α Aquilæ, 29th August, subtract 48″, † and from β Aquilæ 45″.

OBSERVATIONS *at large for determining the Latitudes of* PLACES.

From henceforward all the Observations were taken by Lieutenant COLEBROOKE.

Phænomenon and Face of the Quadrant.	*Date.*	ARCH OF 96. *Reading.*	*Value.*	*Arch of 90.*	*Equation applied.*	*Zenith Distance corrected.*	*Declination.*	*Latitude by the observation.*	*Name of the place and its correct Latitude.*
	1784.	D. SD.N.	° ′ ″	° ′ ″	″	° ′ ″	° ′ ″	° ′ ″	
α Cephei, W.	Oct.	46.01.24	43.32.06,8	43.31.30	53	43.32.42,3	61.40.42,2N.	18.08.00	Vizianagur Palace,
β Aquarii, E.	22d,	26.00.26	24.33.55,6	24.33.30	26	24.34.08,8	6.30.33 S.	18.03.35,8	
α Cygni, W.	23d,	28.00.15,8	26.21.35,5	26.22.00	28	26.22.15,8	44.31.05,3N.	18.08.49,6	
α Cephei, W.		46.01.25	43.32.32,9	43.31.46	54	43.33.03,5	61.40.42,2N.	18.07.38,7	° ′ ″
β Aquarii, E.		26.00.26	24.33.55,6	24.33.35	26	24.34.11,3	6.30.33 S.	18.03.38,3	18.05.52,3
α Cygni, W.	25th,	28.00.27	26.26.51,9	26.27.00	28	26.26.24	44.31.05,2N.	18.03.41,2	Brimsing,
α Cephei, W.		46.02.00	43.36.30,2	43.35.50	54	43.37.04,1	61.40.42,2N.	18.03.38,1	° ′ ″
β Aquarii, E.		26.00.19	24.30.51	24.30.00	26	24.30.51,5	6.30.33 S.	18.00.18,0	18.01.59
7 Lacertæ, W.	26th,	33.01.23	31.20.25,2	31.20.00	34,4	31.20.47	49.10.48 N.	17.50.01	Santipollum,
Fumulhoot, E.		51.03.07	48.34.00,8	48.33.30	64	48.34.49,5	30.45.25,6 S.	17.49.23,8	° ′ ″ 17.49.42,4
α Cephei, W.	31st,	46.02.00	43.35.37,5	43.35.00	54	43.36.13	61.40.42,2N.	18.05.29,2	Chintulwilsa,
β Aquarii, E.		26.00.18	24.30.24,6	24.30.00	25,7	24.30.38	6 30.33 S.	18.00.05	° ′ ″ 18.02.17,1
α Cephei, W.	Nov.	46.01.26	43.32.59,3	43.32.50	54	43.33.48,6	61.40.42,2N.	18.06.53,6	Narrainpoore,
β Aquarii, E.	1st.	26.00.23	24.32.36,5	24.32.20	26	24.32.54,3	6.30.33 S	18.02.21,3	
Fumulhoot, E.		52.00.08	48.48.30,9	48.48.30	65	48.49.35,5	30.45.25,6 S.	18.04.08,9	
β Cassiopææ, W.		42.01.29	39.49.18,4	39.49.00	48	39.49.57,2	57.57.50 N	18.07.52,8	° ′ ″ 18.05.18,7
α Aquarii, E.	3d,	20.02.26	19.24.33,5	19.24.00	20	19.24.36,8	1.21.30,6 S.	18.03.06,2	Kundawilsa,
7 Lacertæ, W.		33.00.11	31.01.05,1	31.01.30	34	31.01.51,6	49.10.48 N.	18.08.56,4	° ′ ″ 18.06.01,3
α Aquarii, E.	4th,	20.03.10	19.31.34,9	19.31.30	20	19.31.52,5	1.21.30,6 S.	18.10.21,9	Timorgudha,
7 Lacertæ, W.		33.00.00	30.56.15	30.55.20	34	30.56.21,5	49.10.48 N.	18.14.26,5	° ′ ″ 18.12.24,2 SicacoleCamp,
α Andromedis, W.	5th,	10.00.27	9.34.22	9.34.20	10	9.34.31	27.53.56 N.	18.19.25	° ′ ″
γ Pegasi, E		4.02.06	4.15.45,7	4.15.00	4	4.15.27	13.59.10 N.	18.14.37	18.17.01
α Cephei, W.	7th,	46.00.21	43.16.43,7	43.17.00	53	43.17.45	61.40.42,2N.	18.22.57,2	Kalingapatam, Camp,
Fumulhoot, E.		52.01.11	49.03.54	49.04.00	65	49.05.02	30.45.25,6 S.	18.19.36,4	° ′ ″ 18.21.16,8
Fumulhoot, E.	9th,	52.01.28	49.11.22,1	49.11.20	64	49.12.25		18.26.59,4	Kulliparoo,
α Andromedis, W.		10.00.02	9.23.22,4	9.23.30	10	9.23.36	27.53.53 N.	18.30.17	° ′ ″
γ Pegasi, E.		4.03.02	4.28.04	4.27.30	5	4.27.52	13.59.07 N.	18.26.59	18.28.39 Cosseboogaum,
α Andromedis, W.	11th,	9.02.27	9.06.14,5	9.05.40	10	9.06.07	27.53.53 N.	18.47.46	° ′ ″
γ Pegasi, E.		5.00.05	4.43.27	4.43. 0	4,5	4.43.18	13.59.07,5N.	18.42.25,5	18.45.05,8
Fumulhoot, E.	14th,	53.00.10	49.45.38,7	49.45.30	67	49.46.41,4	30.45.22,5 S.	19.01.19	Kutwaul Talanb,
β Cassiopææ, W.		41.01.28	38.52.37,1	38.52.00	56	38.53.04,6	57.57.46,7N.	19.04.42,1	° ′ ″ 19.03.00,5

OBSERVATIONS *at large for determining the Latitudes of* PLACES.

Phænomenon and Face of the Quadrant.	*Date.*	ARCH OF 96. *Reading.*	*Value.*	*Arch of 90.*	*Equation applied.*	*Zenith Distance corrected.*	*Declination.*	*Latitude by the observation.*	*Name of the place and its correct Latitude.*
	1784.	D.SD.N.	° ′ ″	° ′ ″	″	° ′ ″	° ′ ″	° ′ ″	
α Andromedis, W.	Nov. 15th,	9.01.10	8.44.42,5	8.45.00	8,7	8.45.00	27.53.59 N.	19.08.59	Ichapoor,
γ Pegasi, E.		5.01.23	5.05.25,3	5.05.00	5	5.05.17,5	13.59.13,3N.	19.04.30,8	° ′ ″ 19.06.45
7 Lacertæ, W.	16th,	31.03.10	29.50.20	29.49.40	33	29.50.33	49.10.45 N.	19.20.12	Burrampoore,
Fumulhoot, E.		53.01.15	50.01.54,3	50.02.00	67	50.03.04,2	30.45.22,5 S.	19.17.41,7	° ′ ″ 19.18.57
7 Lacertæ, W.	17th,	31.03.13	29.51.39,1	29.51.00	33	29.51.52,6	49.10.45 N.	19.18.52,4	Munsoor Cottah,
Fumulhoot, E.		53.01.10	49.59.40,4	49.59.30	67	50.00.42,2	30.45.22,5 S.	19.15.19,7	° ′ ″ 19.17.05,5
E.	18th,	53.01.24	50.05.51,6	50.05.30	67	50.06.48		19.21.25,5	Ganjam Camp,
β Cassiopææ, W.		41.00.13	38.31.58	38.31.00	46	38.32.15	57.57.53 N.	19.25.38	° ′ ″ 19.23.32
Fumulhoot, E.	25th,	53.02.06	50.12.00,7	50.12.00	67	50.13.07,5	30.45.22,5 S.	19.27.45	Piaghee,
β Cassiopææ, W.		41.00.03	38.27.34,7	38.26.50	45,6	38.27.58	57.57.50,0N.	19.29.55	° ′ ″ 19.28.50
Fumulhoot, E.	26th,	43.02.14	50.15.31,7	50.15.30	67	50.16.38	30.45.22,5 S.	19.31.15,5	Maloodee,
β Cassiopææ, W.		40.03.25	38.23.11	38.23.10	45,6	38.23.56,1	57.57.53 N.	19.33.57	° ′ ″ 19.32.36,5
Fumulhoot, E.	29th,	53.03.04	50.25.11,8	50.24.40	67	50.26.02	30.45.22,5 S.	19.40.40,5	Manickpatam,
α Andromedis, W.		8.02.29	8.10.52,2	8.10.50	8	8.10.59,1	27.53.59,0N.	19.43.00	
α Cassiopææ, W.		38.00.01	35.37.56,4	35.37.30	40,8	35.38.24	55.21.23,0	19.42.59	° ′ ″ 19.41.50
Fumulhoot, E.	Dec.	53.03.21	50.32.40	50.32.30	67	50.32.42	30.45.22,5 S.	19.48.19,5	Jaggernaut,
γ Pegasi, E.	4th,	6.00.21	5.46.43,7	5.46.30	6	5.46.43	13.59.13,3 S.	19.45.56,3	
α Cassiopææ, W.		37.03.22	35.33.06,3	35.32.40	41	35.33.34,2	55.21.23 N.	19.47.49	
α Andromedis, W.		8.02.12	8.03.26	8.03.00	8	8.03.21	27.53.59 N.	19.50.38	° ′ ″ 19.41.50
α Andromedis, W.	7th,	8.01.21	7.53.17,5	7.53.20	8	7.53.27	27.53.59 N.	20.00.32	Ahmetpoore,
α Cassiopææ, W.		37.02.26	35.20.48	35.21.00	40	35.21.34	55.21.23 N.	19.59.49	
ε Cassiopææ, W.		45.01.24	42.35.52	42.36.00	52	42.36.44	62.36.07 N.	19.59.23	
γ Pegasi, E.		6.01.06	5.54.12	5.54.00	6	5.54.12	13.59.33,3N.	19.53.25,3	
η Ceti, E.		33.01.05	31.12.30,7	31.12.00	34	31.12.49,4	11.19.35 S.	19.53.14,4	° ′ ″
θ Ceti, E.		31.00.17	29.11.13,3	29.10.30	32	29.11.23,6	9.17.47 S.	19.53.36,6	19.56.40,2
α Cassiopææ, W.		37.02.05	35.11.34,3	35.11.00	40	35.11.57	55.21.23 N.	20.09.26	Peeply,
δ Cassiopææ, W.	8th,	41.02.07	38.57.27,1	38.57.00	46	38.57.59,6	59.06.56 N.	20.08.56	° ′ ″
η Ceti, E.		33.02.00	31.24.22,6	31.24.00	34,4	31.24.46	11.19.35 S.	20.05.11	20.07.11
α Andromedis, W.	9th,	8.00.08	7.33.31	7.33.00	7,5	7.33.23	27.53.59 N.	20.20.36	Ballunta,
γ Pegasi, E.		6.02.22	6.15.18	6.15.30	6	6.15.30	13.59.13 N.	20.14.43	° ′ ″ 20.17.40

OBSERVATIONS *at large for determining the Latitudes of* PLACES.

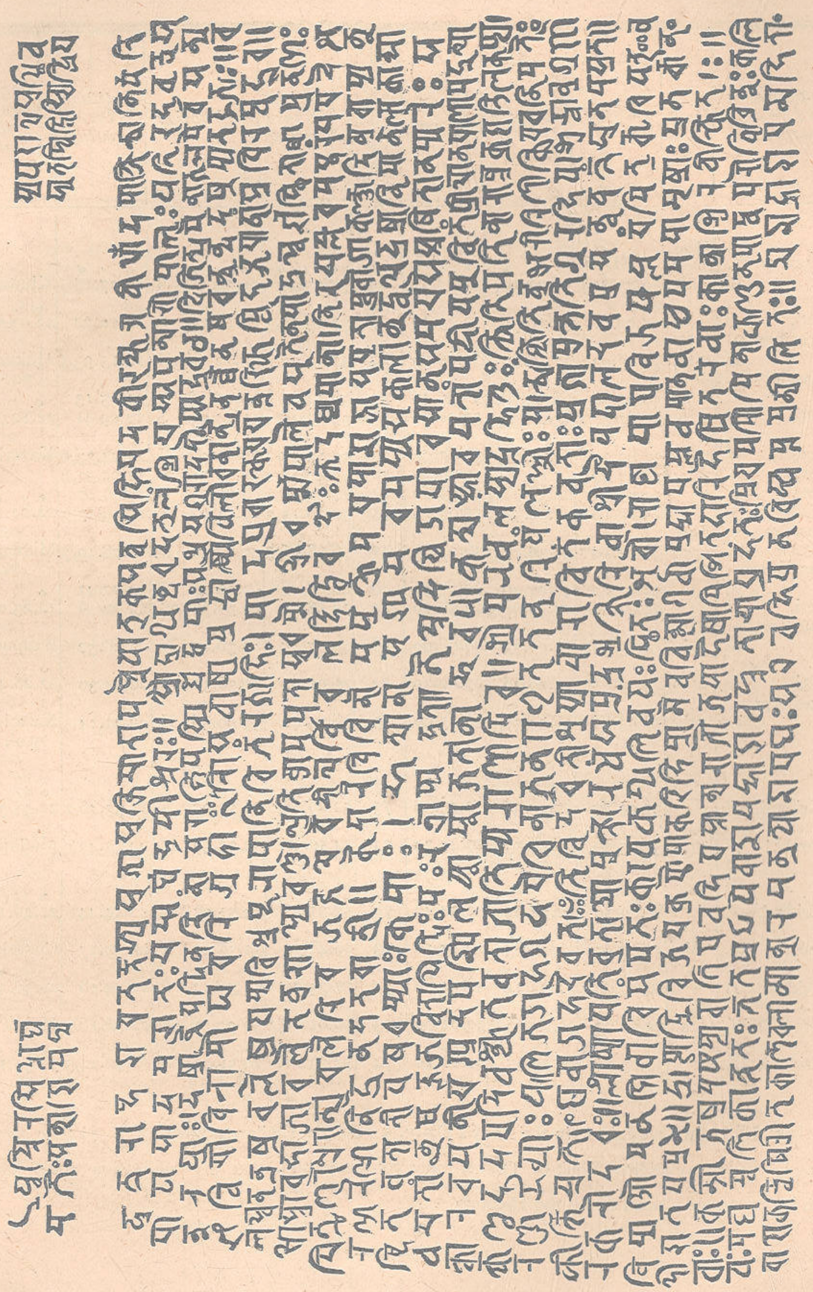
Phænomenon and Face of the Quadrant.	*Date.*	ARCH OF 96. *Reading.*	*Value.*	*Arch of 90.*	*Equation applied.*	*Zenith Distance corrected.*	*Declination.*	*Latitude by the observation.*	*Name of the place and its correct Latitude.*
	1784. Dec.	D.SD.N.	° ′ ″	° ′ ″	″	° ′ ″	° ′ ″	° ′ ″	
γ Cassiopææ, W.	10th,	41.02.22	39.04.02,6	39.03.30	46	39.04.30	59.52.54 N.	20.28.21,7	Sowlagunda, near Kuttack,
η Ceti, E.		33.03.13	31.43.59	31.43.30	35	31.44.20	11.19.35 S.	20 24.45	20.26.33,5
ε Cassiopææ, W.	15th,	44.02.16	41.50.09,4	41.49.40	51	41.50.45,7	62,36.07 N.	20.45.21,3	Koomereah River, north side,
α Piscium, E.		20.00.29	18.57.44,7	18.57.40	19	18.58.01,4	1.43.03 N.	20.41.04,4	20.43.13
α Cassiopææ, W.	17th,	36.02.20	34.26.18,5	34.26.00	39	34.26.48,3	55.21.23 N.	20.54.34,7	Jehaujepoore River, north side,
η Ceti, E.		34.01.04	32.18.19,3	38.08.20	35	32.08.55	11.19.35 S.	20.49.20	20.51.57
γ Cassiopææ, W.	19th,	41.00.15	38.32.50,5	38.32.30	45	38.33.25,3	59.32.54 N.	20.59.28,7	Chorakootee,
δ Cassiopææ, W.		40.02.18	38.06.02,1	38.05.30	44	38.06.30	59.06.56 N.	21.00.26	
θ Ceti, E.		32.01.04	30.15.49,3	30.15.20	33,3	30.16.08	9.17.47 S.	20.58.21	20.59.09
β Cassiopææ, W.	20th,	44.00.29	31.27.44,7	41.27.30	50	41 28.27,4	62.36.07 N.	21.07.40,4	Raneeka Taulaub,
δ Ceti, E.		23.00.29	21.42.06	21.42.00	22	21.42.25	0.36.32 S.	21.05 53	21.06.46
α Cassiopææ, W.	21st.	36.01.15	34.05.39,3	34.05.20	38	34.06.08	55.21 23 N.	21.15.15	Kaunse Baunse,
δ Cassiopææ, W.		40.01.16	37.51.05,7	37.51.00	44	37.51.47	59.06.56 N.	21.15.09	
η Ceti, E.		34.02.24	32.31.10,3	02.30.40	36	32.31.31,2	11.19.35 S.	21.11.56,2	
θ Ceti, E.		32.02.06	30.30.45,7	30.30.20	33	30.31.06	9.17.47 S.	21.13.19	21.13.52,3
α Cassiopææ, W.	22d,	36.00.24	33.55.33	33.55.30	38	33.56.09,5	55.21.23 N.	21.25.13,5	Aumnulla,
η Ceti, E.		34.03.12	32.39.57,3	32.39.40	35,4	32.40.24	11.19.35 S.	21.20.49,0	21.23.01,2
ε Cassiopææ, W.	23d,	43.02.24	40.57.05,4	40.57.00	49,3	40.57.52	62.36.07 N.	21.38.14,3	Daumdurpoor,
γ Andromedis, W.		20.03.25	19.38.10,5	19.37.40	21,8	19.38.17	41.17.22 N.	21.39. 5,0	
α Piscium, E.		21.00.24	19.51.48	19.51.00	21	19.51.45	1.43.03 N.	21.34.48,0	
δ Ceti, E.		23.02.18	22.09.47,2	22.10.00	22,4	22.10.16	0.36.32,0 S.	21.33.44,0	21.36.38
ε Cassiopææ, W.	24th,	43.02.06	40.49.10,8	40.49.00	49	40.19.54,4	62,36,07 N.	21.46.12,6	Soobanreeka River, at Rauje Gaut, on the Ballasore side,
δ Ceti, E.		23.03.09	22.19.54	22.19.30	22	22.20.04	0.36.32 S.	21.43.32,0	
ε Cassiopææ, W.	26th,	43.01.30	40.46.10	40.46.00	49	40.46.54	62.36.07 N.	21.49.13,0	
ε Eridani, E.		34.00.06	31.55.08	31.55.08	35	31.55.43	10.13.26,6 S.	21.42.16,4	21.45.18,5
									Jellasore Camp,
δ Cassiopææ, W.	27th,	39.03.02	37.16.49	37.16.00	48	37.17.13	59.06.56 N.	21.49.43	
δ Ceti, E.		23.03.10	22.20.20	22.20.00	24	22.20.34	0.36.32 S.	21.44.02	21.46.53
η Ceti, E.	28th,	35.01.27	33.14.40,6	33.14.00	38	33.14.58,3	11.19.35 S.	21.55.23,3	Dantoon Camp,
δ Cassiopææ, W.		39.02.11	37.06.32,5	37.06.00	43	37.06.59,3	59.06.56 N.	21.59.56,7	21.57.40

OBSERVATIONS *at large for determining the Latitudes of* PLACES.

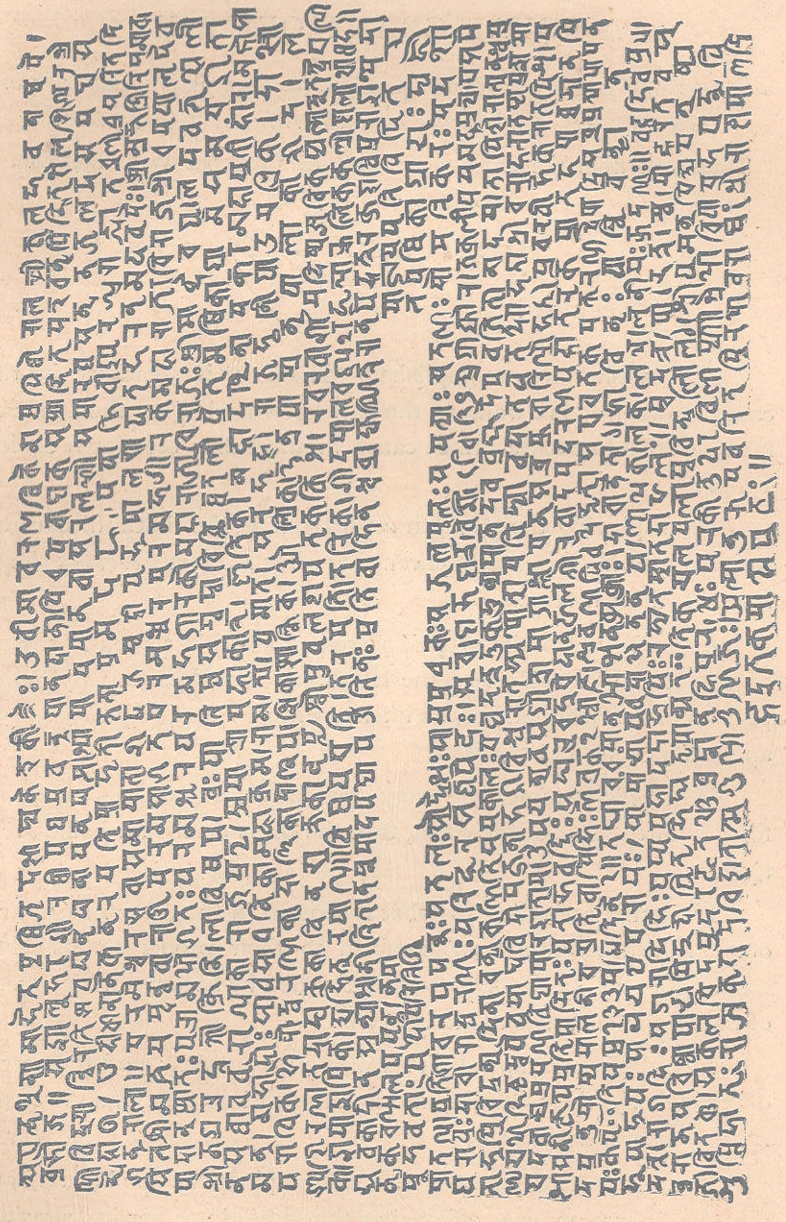
Phænomenon and Face of the Quadrant.	*Date.*	ARCH OF 96. *Reading.*	*Value.*	*Arch of 90.*	*Equation applied.*	*Zenith Distance corrected.*	*Declination.*	*Latitude by the observation.*	*Name of the place and its correct Latitude.*
	1784. Dec.	D.SD.N.	° ′ ″	° ′ ″	″	° ′ ″	° ′ ″	° ′ ″	
γ Cassiopææ, W.	29th,	39.03.21	37.25.10	37.24.40	42	37.25.37	59.32.55,5 N.	22.07.18	Khutnagur,
η Ceti, E.		35.02.06	33.19.30,6	33.19.10	37	33.19.57,3	11.19.35 S.	22.00.22	22.03.50
γ Cassiopææ, W.	30th,	39.03.02	37.16.49	37.16.30	42	37.17.22	59.32.55,5 N.	22.15.33,5	Mokurrumpoor,
δ Cassiopææ, W.		39.01.08	36.51.19,7	36.50.40	43	36.51.43	59.06.56 N.	22.15.13	
η Ceti, E.		35.02.27,5	33.28.57,5	33.28.20	37	33.29.16	11.19.35 S.	22.09.41	22.12.32,1
γ Persei, W.	31st,	32.00.29	30.12.44,7	30.13.00	33	30.13.25,4	52.37.59 N.	22.24.33,6	Kassai River,
β Persei, W.		18.03.14	17.40.50,4	17.40.30	18	17.40.58,2	40.06.50 N.	22.25.51,8	
δ Ceti, E.		24.01.26	22.55.29,3	22.55.00	24	22.55.39	00.36.32 S.	22.19.07	
12 Eridani, E.		55.02.16	52.08.54,5	52.09.10	73	52.10.15,3	29.51.02 S.	22.19.13,3	22.22.11,3
δ Cassiopææ, W.	Jan. 4th,	39.00.10	36.38.08,7	36.37.40	42	36.38.36,3	59.06.56 N.	22.28.19,7	Midnapoor Fort,
ε Cassiopææ, W.		42.03.07	40.07.46	40.07.30	48	40.08.26	62.36.07 N.	22.27.41	
δ Ceti, E.		24.02.00	22.58.07,5	22.58.00	24	22.58.48	00.36.32 S.	22.22.16	22.25.08,3
ε Cassiopææ, W.	5th,	42.03.05	40.06.53	40.06.00	48	40.07.15	62.36.07 N.	22.28.52	Bunpoor,
δ Ceti, E.		24.02.06	23.00.46	23.00.30	24	23.01.02	00.36.32 S.	22.24.30	22.26.41
δ Cassiopææ, W.	6th,	38.03.12	36.24.57,7	36.25.00	43	36.25.42	59.06.56 N.	22.41.14	Narraindeowul,
12 Eridani, E.		55.03.22	52.25.36,4	52.25.30	75	52.26.48,2	29.51.02 S.	22.35.46,2	22.38.30
γ Persei, W.	7th,	31.03.09	29.49.53,6	29.49.20	33	29.50.10	52.37.59 N.	22.47.49	Madapoor,
12 Eridani, E.		56.00.10	52.34.24	52.34.40	74	52.35.46	29.51.02 S.	22.44.44	22.46.16,5
γ Persei, W.	8th,	31.03.05	29.48.03	29.47.50	33	29.48.32	52.37.59 N.	22.49.27	Chunderbund,
12 Eridani, E.		56.00.09	52.34.11	52.34.00	74	52.35.20	29 51.02 S.	22.44.18	22.46.52,5
γ Persei, W.	10th,	32.00.03	30.01.19,8	30.01.00	33	30.01.42,5	52.37.39 N.	22.36.16,5	Habra Gaut,
12 Eridani, E.		55.03.14	52.22.05,4	52.22.10	74	52.33.21,7	29.51.02 S.	22.32.19,7	22.34.18,1

MR. BURROWS published, in the Lady's Diary, a Theorem similar to mine, page 71: he shewed it to me last year: my original Book of Observations convinced him, that his publication could not have been known to me when I wrote the Theorem.

Vol. I. 1.P.112.



Vol. I. 2.P.112.



III.

A ROYAL GRANT OF LAND,

Engraved on a Copper Plate, bearing date twenty-three years before CHRIST, *and discovered among the ruins at* MONGUEER.

Translated from the Original *Sanscrit*, by CHARLES WILKINS, Esq. in the Year 1781.

DEB PAAL DEB*.

PROSPERITY!

HIS wishes are accomplished. His heart is steadfast in the cause of others. He walks in the paths of virtue. May the achievements of this fortunate Prince cause innumerable blessings to his People!

By displaying the strength of his genius, he hath discovered the road to all human acquirements; for being a *Soogot* (1) he is Lord of the Universe.

Gopaal, King of the World, possessed matchless good Fortune: he was Lord of two Brides; the Earth and her Wealth. By comparison of the learned, he was likened unto *Preetoo*, (2,) *Sogor*, (3,) and others, and it is credited.

When his innumerable army marched, the heavens were so filled with the dust of their feet, that the birds of the air could rest upon it.

He acted according to what is written in the *Shastra*, (4,) and obliged the different sects to conform to their proper tenets. He was blessed with a son, *Dhormo Paal*, when he became independent of his forefathers, who are in heaven.

His elephants moved like walking mountains; and the earth, oppressed by their weight, and mouldered into dust, found refuge in the peaceful heavens.

He went to extirpate the wicked, and plant the good; and happily his salvation was effected at the same time: for his servants

* In this translation the *Sanscrit* names are written, as they are pronounced in *Bengal*; but, in the following paper, the translator has adopted the more elegant pronounciation of *Vâránes* and *Cas'hmir*.

visited *Kedaar*, (1,) and drank milk according to the law: and they offered up their vows, where the Ganges joins the ocean, and at *Gokornaa*, (2,) and other places, (3,)

When he had completed his conquests, he released all the rebellious princes he had made captive; and each returning to his own country laden with presents, reflected upon this generous deed, and longed to see him again; as mortals, remembering a pre-existence, wish to return to the realms of light.

This prince took the hand of the daughter of *Porobol*, Raajaa of many countries, whose name was *Ronnaa Debee;* and he became settled.

The people, being amazed at her beauty, formed different opinions of her; some said it was *Lockee* (4,) herself in her shape; others, that the earth had assumed her form; many said it was the Raajaa's fame and reputation; and others that a household goddess had entered his palace. And her wisdom and virtue set her above all the ladies of the court.

This virtuous and praise-worthy princess bore a son, *Deb Paal Deb*, as the shell of the ocean produces the pearl: ———

In whose heart there is no impurity; of few words, and gentle manners; and who peaceably inherited the kingdom of his father, as *Bodheestwo* (5,) succeeded *Soogot*.

He who, marching through many countries making conquests, arrived with his elephants in the forests of the mountains of *Beendhyo*, (6,) where seeing again their long lost families, they mixed their mutual tears; and who going to subdue other princes, his young horses meeting their females at *Komboge* (7,) they mutually neighed for joy.

He who has opened again the road of liberality, which was first marked out in the *Kreeto Joog* (8,) by *Bolee*, (9,) in which *Bhaargob* (10,) walked in the *Tretaa Joog*, (11,) which was cleansed by *Korno* (12,) in the *Dwapor Joog*, (13,) and was again choked up in the *Kolee Joog* (14,) after the death of *Sokodwesee*, (15,)

He who conquered the earth from the source of the *Ganges* as far as the well-known bridge which was constructed by the enemy of *Dosaasyo*, (16,) from the river of *Luckeecool* (17,) as far as the ocean of the habitation of *Boroon*, (18,) At *Mood-go-gheeree*, (1,) where is encamped his victorious army, across whose river a bridge of boats is constructed for a road, which is mistaken for a chain of mountains, where immense herds of elephants, like thick black clouds, so darken the face of day, that people think it the season of the rains; whither the princes of the north send so many troops of horse, that the dust of their hoofs spreads darkness on all sides; whither so many mighty chiefs of *Jumboodweep* (2,) resort to pay their respects, that the earth sinks beneath the weight of the feet of their attendants. There *Deb Paal Deb* (who, walking in the footsteps of the mighty lord of the great *Soogots*, the great commander, *Raajaa* of *Mohaa Raajaas, Dhormo Paal Deb*, is himself mighty lord of the great *Soogots*, a great commander, and *Raajaa* of *Mohaa Raajaas)* issues his commands. To all the inhabitants of the town of *Meseeka*, situated in *Kreemeelaa*, in the province of *Sree Nogor*, (3,) which is my own property, and which is not divided by any land belonging to another; to all *Raanok and Raaje-pootro*; to the (4,) *Omaatyo, Mohaa-kaarttaa-kreeteeko, Mohaa-Dondo-Nayk, Mohaa-Proteehaar, Mohaa-Saamont, Mohaa-Dow-Saadhon-Saadhoneeko, Mohaa-Koo-maaraa-Matyo;* to the *Promaatree* and *Sorobhongo;* to the *Raajas-taaneeyo, Ooporeeko, Daasaaporaadheeko, Chowrod-dhorneeko, Daan-deeko, Dondopaaseeko, Sowl-keeko, Gowlmeeko, Kyotropo, Praanto-paalo, Kothtopaalo* and *Kaandaarokyo*, to the *Todaajooktoko* and the *Beeneejooktoko;* to the keeper of the elephants, horses and camels; to the keeper of the mares, colts, cows, buffaloes, sheep, and goats; to the *Dootoprysoneeko, Gomaa-Gomeeko*, and *Obheetworomaano;* to the *Beesoypotee, Toropotee*, and *Toreeko*. To the different tribes, *Gowr, Maalob, Khoso, Hoon, Kooleeko, Kornaato, Laasaato*, and *Bhoto;* to all others of our subjects, who are not here specified; and to the inhabitants of the neighbouring villages, from the *Braahmon* and fathers of large families, to the tribes of *Medo, Ondhoroko*, and *Chondaalo*.

Be it known that I have given the above-mentioned town of *Meeseeka*, whose limits include the fields where the cattle graze, above and below the surface, with all the lands belonging to it; together with all the *Mango* and *Modhoo* trees; all its waters, and all their banks and verdure; all its rents and tolls, with all fines for crimes, and rewards for catching thieves. In it there shall be no molestation, no passage for troops; nor shall any one take from it the smallest part. I give likewise every thing that has been possessed by the servants of the Raajaa. I give the Earth and Sky, as long as the Sun and Moon shall last. Except, however, such lands as have been given to God, and to the *Braahmons*, which they have long possessed and now enjoy. And that the glory of my father and mother, and my own fame, may be increased, I have caused this *Saason* (1,) to be engraved, and granted unto the great *Botho Beehkoraato Meesro*, who has acquired all the wisdom of books, and has studied the *Beads* (2,) under *Oslaayono;* who is descended from *Owpomonyobo;* who is the son of the learned and immaculate *Botho Boraahoraato;* and whose grandfather was *Botho Beesworaato*, learned in the *Beads*, and expert in performing the *Jog*, (3,).

Know all the aforesaid, that as bestowing is meritorious, so taking away deserves punishment; wherefore leave it as I have granted it. Let all his neighbours, and those who till the land, be obedient to my commands. What you have formerly been accustomed to perform and pay, do it unto him in all things. Dated in the 33d *Sombot*, (4,) and 21st day of the month of *Maargo*.

Thus speak the following *Slokes* (5,) from the *Dhormo Onoosaason:*

1. "*Ram* hath required, from time to time, of all the Raajaas "that may reign, that the bridge of their beneficence be the same, "and that they do continually repair it.

2. "Lands have been granted by *Sogor*, and many other "Raajaas; and the same of their deeds devolves to their successors.

3. "He who dispossesses any one of his property, which I "myself, or others, have given, may he, becoming a worm, grow "rotten in ordure with his forefathers!

4. "Riches and the life of man are as transient as drops of "water upon a leaf of the lotus. Learning this truth, O man! do "not attempt to deprive another of his reputation."

The Raajaa, for the public good, hath appointed his virtuous son, *Raajyo Paal*, to the dignity of *Jowbo Raajaa*. He is in both lines of descent illustrious, and hath acquired all the knowledge of his father.

NOTES.

Page 112. (1,) *Soogot*—signifies an atheist, or follower of the tenets of *Soogot*, a philosopher, who is said to have flourished at a place called *Keekot*, in the province of *Behar*, one thousand years after the commencement of the *Kolee Joog*, or *Iron Age*; of which this is the 4882d year. He believed in visible things only, or such as may be deduced from effects the cause of which is known: as from smoke the existence of fire. He wrote many books to prove the absurdity of the religion of the *Brahmons*; and some upon astronomy and other sciences, all which are said to be now in being. He further held that all our actions are attended by their own rewards and punishments in this life; and that all animals, having an equal right to existence with man, they should not be killed either for sport or food.

(2,) *Preetoo*—was the son of *Beno*, and *Raajaa* of a place called *Beetoor*, near *Lucknow*. He flourished in the first age of the world, and is said to have levelled the earth, and, having prepared it for cultivation, obliged the people to live in society.

(3,) *Sogor*—the name of a Raajaa who lived in the second age at *Ojoodho*, and is said to have dug the rivers.

(4,) *Shastra*—book of divine ordinations. The word is derived from a root signifying to command.

Page 113. (1,) *Kedaar*—a famous place, situated to the north of Hindostan, visited, to this day, on account of its supposed sanctity.

(2,) *Gokornaa*—a place of religious resort near *Punjab*.

(3,) This and a few other passages appear inconsistent with the principles of a *Soogot*; to reconcile it therefore, it should be remarked, that, as he was issuing his orders to subjects of a different persuation, it was natural for him to use a language the best calculated to strike them with awe, and bind them to a performance of his commands. The *Pundit*, by whose assistance this translation was made, when he was desired to explain this seeming contradiction, asked whether we did not, in our courts, swear a *Mussulman* upon the *Koran*, and a *Hindoo* by the waters of the *Ganges*, although we ourselves had not the least faith in either.

(4,) *Lockee*—the *Hindoo* goddess of fortune.

(5,) *Bodheestwo*—was the son of *Soogot*.

(6,) *Beendhyo*—name of the mountains on the continent near *Ceylon*.

(7,) *Komboge*—now called *Cambay*.

(8,) *Kreeto Joog*—the first age of the world, sometimes called the *Sutteo Joog*, or age of purity.

(9,) *Bolee*—a famous giant of the first age who is fabled to have conquered earth, heaven, and hell.

(10,) *Bhaargob*—a *Brahmon*, who, having put to death all the princes of the earth, usurped the government of the whole.

(11,) *Tretaa Joog*—the second age, or of three parts good.

(12,) *Korno*—a famous hero in the third age of the world. He was general to *Doorjodhon*, whose wars with *Joodzisteer* are the subject of the *Mohabharat*, the grand epick poem of the *Hindoos*.

(13,) *Dwapor Joog*—the third age of the world.

(14,) *Kolee Joog*—the fourth or present age of the world, of which 4882 years are elapsed.

(15,) *Sokodwesee*—an epithet of *Beekromaadeetyo*, a famous Raajaa. He succeeded his brother *Sokaadeetyo*, whom he put to death.

(16,) *Dosaasyo*—one of the names of *Raabon*, whose wars with *Raam* are the subject of a poem called the *Raamayon*.

(17,) *Luckeecool*—now called *Luckeepoor*.

(18,) *Boroon*—God of the ocean.

According to this account the Raajaa's *dominions* extended from the Cow's Mouth to Adam's Bridge in *Ceylon*, said to have been built by *Raam* in his wars with *Raabon*; from *Luckeepoor* as far as *Goozerat*.

Page 114. (1,) *Mood-go-gheeree*—now called *Mongueer*.

(2,) *Jumboodweep*—according to the Hindoo geography, implies the habitable part of the earth.

(3,) *Sree Nogor*—the ancient name of *Patna*.

(4,) *Omaatyo*, prime minister. *Mohaa-kaarttaa-kreeteeko*, chief investigator of all things. *Mohaa-Dondo-Nayk*, chief officer of punishments. *Mohaa-Protee-haar*, chief keeper of the gates. *Mohaa-Saamonto*, generalissimo. *Mohaa-Dow-Saadhon-Saadhoneeko*, chief obviator of difficulties. *Mohaa-Koomaaraa-Matyo*, chief instructor of children. *Promaatree*, keeper of the records. *Sorobhongo*, patrols. *Raajostaaneeyo*, viceroy. *Ooporeeko*, superintendent. *Daasaapo-raadheeko*, investigator of crimes. *Chow-rod-dhoroneeko*, thief catcher. *Daan-deeko*, mace-bearer. *Dondo-paseeko*, keeper of the instruments of punishment. *Sowl-keeko*, collector of customs. *Gowlmeeko*, commander of a small party. *Kyotropo*, supervisor of cultivation. *Praantopaalo*, guard of the suburbs. *Kothtopaalo*, commander of a fort. *Kaandaarokyo*, guard of the wards of the city. *Todaajooktoko*, chief guard of the wards. *Beeneejook-toko*, director of affairs. *Dootoprysoneeko*, chief of the spies. *Gomaa-Gomeeko*, messengers. *Obheeworomaano*, swift messengers. *Beesoypotee*, governor of a city. *Toropotee*, superintendent of the rivers. *Toreeko*, chief of the boats.

Page 115. (1,) *Saason*—signifies an edict.

(2,) *Beads*—Hindoo Scriptures.

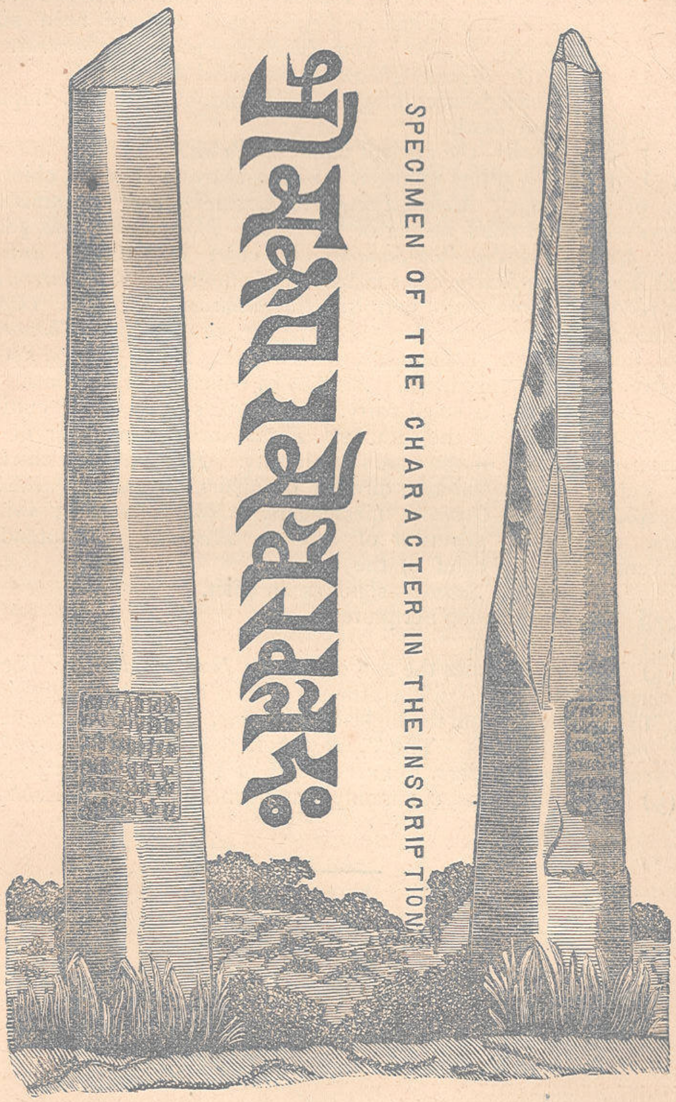
(3,) *Jog*—sacrifice.

(4,) *Sombot*—implies the æra of Raajaa *Beekromadeetyo*. The *Brahmons* throughout Hindostan keep time according to the three following epochs: The *Kolyobdo*, from the flight of *Kreeshno*, or commencement of the *Kolee Joog*, 4882 years. The *Sombot*, from the death of *Beekromadeetyo*, 1837 years. The *Sokaabdo*, from the death of Raajaa *Soko* 1703.

(5,) *Slokes*—stanzas, commonly, but erroneously, written *Ashlogues*.

VOL. I. PAGE 119

FRONT VIEW SIDE VIEW



IV.

AN INSCRIPTION ON A PILLAR NEAR BUDDAL.

TRANSLATED FROM THE SANSCRIT,

BY CHARLES WILKINS, ESQ.

SOME time in the month of November, in the year 1780, I discovered, in the vicinity of the town of *Buddal*, near which the Company have a factory, and which at that time was under my charge, a decapitated monumental column, which at a little distance has very much the appearance of the trunk of a coco-nut tree broken off in the middle. It stands in a swamp overgrown with weeds, near a small temple dedicated to *Hărgowrēē*, whose image it contains. Upon my getting close enough to the monument to examine it, I took its dimensions, and made a drawing of it; and soon after a plate was engraved, from which the accompanying is an impression.

It is formed of a single stone of a dirty grey complexion; and it has lost by accident a considerable part of its original height. I was told upon the spot that it had, in the course of time, sunk considerably in the ground; but upon my digging about the foundation I found this was not the case. At a few feet above the ground is an inscription, engraved in the stone, from which I took two reversed impressions with printer's ink. I have lately been so fortunate as to decypher the character; and I have the honour to lay before the Society a transcript of the original in the modern writing, and a translation; and at the same to exhibit the two impressions I took from the stone itself.

The original character of this inscription is very different from the modern form; but it so much resembles that on the plate found by Col. WATSON at *Mongueer*, that I am induced to conclude it to be a work of the same period. The language is *Sămskrēēt*, and the whole is comprised in twenty-eight metrical verses of various measures.

CHARLES WILKINS.

14th July 1785.

PROSPERITY!

I.

VEERĂ DĒV was of the *Sāndēēlyă race*, (1,) from him was descended *Pānchāl;* of whose generation, and of whom, was *Gărgă* born.

II.

He, another *Săkră*, (2,) was ruler but of one quarter, and had no authority in other regions. He, too, was defeated by *Dityă* (3,) chiefs; but being a virtuous prince, he became supreme over every country without reserve; and his conduct was such, that he laughed *Vrēēhăspatēē* (4,) to scorn.

III.

Eechā (5,) was his wife; and, like love, she was the mistress of his heart. She was admired for the native purity of her mind, and her beauty was like the light of the moon.

IV.

In his countenance, which was like the flower of the waters, (6,) were to be traced the lines of four sciences, (7,). The three worlds were held in subjection by his hereditary high rank.

From these two was descended a *Brāhmăn* like *Kămălăyōnēē*, (8,) and he took unto himself the name of *Srēē Dărbhă-pānēē.*

V.

Whose country (extending to *Rēvă-Jănăk*, (9,) to the father of *Gowrēē*, (10,) whose piles of rocks reek with the juice exuding from the heads of intoxicated elephants, and whose snow-white mountains are brightened by the sun's rays; to the two oceans: to that

(1,) A tribe of Brāhmăns still extant.
(2,) Eendră, the God of the Heavens, who is supposed to be the Guardian of the East.
(3,) Evil spirits. *Eendră* is said to have lost his kingdom, for a while, to the Ăsŏŏrs, or Evil spirits.
(4,) The Tutor of the good spirits and the Planet Jupiter.
(5,) Love, Desire.
(6,) The Lotus.
(7,) Arms, Music, Mechanics, Physics.
(8,) Brăhmā.
(9,) Perhaps the *Narbădda*.
(10,) The snowy mountains that part India from Tartary. Gowrēē, one of the names of the *Pārvătee*, the consort of *Seev.*

whence *Arŏŏn* (1,) riseth from its bed, and to that wherein the sun sinketh in the west) the Prince *Srēē Dēv Pāl*, (2,) by his policy, rendered tributary:

VI.

At whose gates (although the prospect, hidden by the dust arising from the multitude of marching force, was rendered clear from the earth being watered by constant and abundant streams, flowing from the heads of lustful elephants of various breeds) stood, scarce visible, amongst the vast concourse of nobles flocking to his standard from every quarter, *Srēē Dēv Pāl*, in expectation of his submission.

VII.

Whose throne that Prince (who was the image of *Eĕndră*, and the dust of whose feet was impressed with the diadems of sundry potentates) himself ascended with a flash of glory, although he had formerly been wont to offer him large sums of *Pēētās*, (3,) bright as the lunar rays.

VIII.

To him was born, of the Princess *Sărkără*, the Brāhmăn *Sōmēswăr*, who was like *Sōm*, (4,) the offspring of *Ătrēē*, and a favourite of the Most High.

IX.

He adopted the manners of *Dhănănjay*, (5,) and did not exult over the ignorant and ill-favoured. He spent his riches amongst the needy. He neither vainly accepted adulation, nor uttered honey words. His attendants were attached by his bounty; and because of his vast talents, which the whole universe could not equal, he was the wonder of all good men.

X.

Anxious for a home and an asylum, he took the hand of

(1,) The charioteer of the sun.—The Aurora of the Hindoos.
(2,) If this be the prince mentioned in the copperplate found by Col. WATSON, he reigned at Mongueer above 1800 years ago.
(3,) A square coin.
(4,) The moon.
(5,) One of the sons of Pandoo, commonly called *Arjoon.*

Rănnā, (1,) a Princess of his own likeness, according to the law, even as *Sēēv* the hand of *Sēēva*, (2,)—even as *Hărēē* (3,) the hand of *Lăkshmēē*.

XI.

From this pair proceeded into life, bursting forth like *Gŏŏhă*, (4,) with a countenance of a golden hue, the fortunate *Kēdārā Mēēsră*, whose actions rendered him the favourite of heaven.—The lofty diadem, which he had attained, shone with faultless splendour, kissing the vast circumference of the earth. His extensive power was hard to be limited; and he was renowned for boundless knowledge raised from his own internal source.

XII.

The ocean of the four sciences, which had been at a single draught drunk up, he brought forth again, and laughed at the power of *Agăstyă*, (5,).

XIII.

Trusting to his wisdom, the king of *Gowr* (6,) for a long time enjoyed the country of the eradicated race of *Ŏŏtkal*, (7,) of the *Hoons* (8,) of humbled pride, of the kings of *Drăvēēr* (9,) and *Gŏŏrjăr*, (10,) whose glory was reduced, and the universal sea-girt throne.

XIV.

He considered his own acquired wealth the property of the needy, and his mind made no distinction between the friend and the foe. He was both afraid and ashamed of those offences which condemn the soul to sink again into the ocean of mortal birth; and he despised the pleasures of this life, because he delighted in a supreme abode.

(1,) A princess of this name is also mentioned in Colonel WATSON's plate.
(2,) *Sēēvā* is the feminine of *Sēēv*.
(3,) *Hărēē*, a name of *Vēēshnŏŏ*.
(4,) *Gŏŏhă*, a name of *Kărtēēk*.
(5,) Who is said to have drunk up the ocean.
(6,) The kingdom of *Gowr* anciently included all the countries which now form the kingdom of *Bengal*, on this side the *Brăhmăpŏŏtră*, except *Mongueer*.
(7,) Orixa.
(8,) Huns.
(9,) A country to the south of the Carnatick.
(10,) Goozerat.

XV.

To him, emblem of *Vrēēhăspătēē*, (1,) and to his religious rites, the prince *Srēē Sŏŏră Păl* (who was a second *Eendră*, and whose soldiers were fond of wounds) went repeatedly; and that long and happy companion of the world, which is girt with several oceans as with a belt, was wont, with a soul purified at the fountain of faith, and his head humbly bowed down, to bear pure water before him.

XVI.

Vánwā, of celestial birth, was his consort, with whom neither the fickle *Lăkshmēē*, nor *Sătēē*, (2,) constant to her lord, were to be compared.

XVII.

She, like another *Dēvăkēē*, (3,) bore unto him a son of high renown, who resembled the adopted of *Yăsōdhă*, (4,) and husband of *Lăkshmēē*, (5,).

XVIII.

This youth, by name *Srēē Gŏŏrăvă Mēēsră* was acquainted with all the constellations. He resembled *Răm*, the son of *Jămădăgnēē*, (6,). He was another *Răm*.

XIX.

His abilities were so great, that he was solicitous to discover the essence of things, wherefore he was greatly respected by the Prince *Srēē Nārăyăn Păl*. What other honour was necessary?

XX.

His policy (who was of no mean capacity, and of a reputation not to be conceived) following the sense of the *Vēds*, was of boundless splendor; and, as it were, a descent of *Dhărmă*, the Genius of Justice. It was regulated by the example of those who trust in the power of speech over things future, who stand upon the connexion

(1,) The preceptor of the good spirits, and the planet *Jupiter*.
(2,) The consort of *Sēēv*.
(3,) The real mother of *Krēēshnă*.
(4,) The foster-mother of *Kreeshnd*.
(5,) *Rŏŏkmeenēē* the consort of *Kreeshnd*. She is here called *Lakshmēē*, in compliance with the idea of her being a descent of that Goddess.
(6,) This is neither the conqueror of *Ceylon*, nor the brother of *Kreeshnd*.

of family, who are in the exercise of paying due praise to the virtues of great men, and who believe in the purity of *Astrology*.

XXI.

In him was united a lovely pair, *Lăksmēē* and *Săr ăswătēē*, the disposer of fortune, and the Goddess of Science, who seemed to have forsaken their natural enmity, and to stand together pointing at friendship.

XXII.

He laughed to scorn him who, in the assemblies of the learned, was intoxicated with the love of argument, and confounded him with profound and elegant discourses framed according to the doctrine of the *Sāstrăs;* and he spared not the man who, because of his boundless power and riches, was overwhelmed with the pride of victory over his enemy in the field.

XXIII.

He had a womb, but it obstinately bore him no fruit. One like him can have no great relish for the enjoyments of life! He never was blessed with that giver of delight, by obtaining which a man goeth unto another almoner, (1,).

XXIV.

He, who was, as it were, another *Vālmēēkēē*, (2,) born in this dark age of impiety, amongst a dreadful and a cruel race of mortals, was a devout man, who displayed the learning of the *Vēds* in books of moral tales.

XXV.

His profound and pleasing language, like *Găngā*, flowing in a triple course (3,) and constant stream, purifieth and delighteth.

XXVI.

He, to whom, and to those of whose generation, men were

(1,) He had no issue to perform the *Srādh* for the release of his soul from the bonds of sin. By *another almoner* is meant the Deity.
(2,) The first poet of the Hindoos, and supposed author of the *Rāmāyān*.
(3,) He is supposed to have written in three languages.

wont to resort as it were to *Brăhmā*, waited so long in expectation of being a father, that, at length, he himself arrived at the state of a child.

XXVII.

By him was recorded here upon this lasting column, the superior beauty of whose shaft catcheth the eye of the beholder, whose aspiring height is as boundless as his own ideas, which is, as it were, a stake planted in the breast of *Kālēē*, (1,) and on whose top sits *Tārkshyă*, (2,) the foe of serpents, and favourite bird of *Haree*, the line of his own descent.

XXVIII.

Gărōōr, like his fame, having wandered to the extremity of the world, and descended even unto its foundation, was exalted here with a serpent in his mouth.

This work was executed by the artist *Bēēndōō Bhădrá*.

(1,) Time.
(2,) Otherwise called *Gărōōr*.

REMARKS ON THE TWO PRECEDING PAPERS.

BY THE PRESIDENT.

NO man has greater respect than myself for the talents of MR. WILKINS, who, by decyphering and explaining the old *Sanscrit* inscriptions lately found in these provinces, has performed more than any other *European* had learning enough to accomplish, or than any *Asiatic* had industry enough even to undertake: but some doubts having arisen in my mind concerning a few passages in the two preceding translations, I venture to propose them in the form of notes with entire deference to his judgment.

P. 112. *l.* 12. *This fortunate Prince*—Is not the first couplet in honour of BUDDHA, one of whose names, in the *Amarcósh*, is SUGATA? A *follower* of his tenets would have been denominated a *Saugat*, in the derivative form. We must observe, that the *Bauddhs*, or *Saugats*, are called *Atheists* by the *Bráhmans*, whom they opposed; but it is mere invective; and this very grant fully disproves the calumny, by admitting a future state of rewards and punishments. SUGAT was a reformer; and every reformer must expect to be calumniated.

P. 112. *l.* 21. *When his inumerable army*—The third stanza in the original is here omitted, either by an oversight, or because the same image of *weeping elephants* occurs afterwards, and might have been thought superfluous in this place: nevertheless, I insert a literal translation of it.

"By whom, having conquered the earth as far as the ocean, it *was* left, "as being unprofitably seized; so *he declared: and his* elephants weeping "saw again in the forests their kindred, whose-eyes-*were*-full-of-tears."

P. 113. *l.* 11. *Of many countries*—The *Pandits* insist that *Ráshtracúta*, in the original, is the name of a particular country.

P. 115. *l.* 20. *Dated in the* 33d *Sombot*—That is, *year*; for *Samvat* is only an abbreviation of *Samvatsara*. This date, therefore, might only mean the thirty-third year *of the King's reign*; but, since VICRAMA'DITYA was surnamed *the foe of* SACA, and is praised by that name in a preceding stanza, we may safely infer, that the grant was dated thirty-three years after the death of that illustrious Emperor, whom the king of *Gaur*, though a sovereign prince, acknowledged as lord paramount of *India*.

P. 120. Verse II. *A virtuous prince*—Many stanzas in this inscription prove, that the *Sándilya* family were not *princes*, but that some of them were prime *ministers* to the kings of *Gaur*, or *Bengal*, according to this comparative genealogy:

Kings.	Ministers*.
GO'PA'LA.	PA'NCHA'LA.
DHERMAPA'LA.	GARGA.
DE'VAPA'LA. B. C. 23.	* DERBHAPA'NI.
RA'JYAPA'LA.	SOME'SWARA.
S'U'RAPA'LA.	* CE'DA'RAMIS'RA.
NA'RA'YANAPA'LA. A. C. 67.	* GURAVAMIS'RA.

So that, reckoning thirty years to a generation, we may date the Pillar of GURAVAMIS'RA in the sixty-seventh year *after* CHRIST. A *Pandit*, named RA'DHA'CA'NTA, with whom I read the original, appeared struck with my remark on the two families, and adopted it without hesitation; but if it be just, the second stanza must be differently interpreted. I suspect *Dharma*, the Genius of *Justice* or *Virtue*, to be the true reading, instead of *Dharmya*, or *virtuous*; and have no doubt that *purò* must be substituted for *paró*: the sense will then be, that INDRA *was ruler in the East only*; and, *though valiant, had been defeated even there by the Daityas* or *Titans*, *but that* DHARMA *was made sovereign over him in all quarters.*

P. 120. Verse V. *Whose country*—The original is:

à réva'janaca'nmatangajamadastimyachch'hilàsanghatéh,
à gauri'piturîswar*éndra*ciranaihpushyatsitimnógiréh,
ma'rtan"da'stamayódaya'runa'jala'd a' va'r'ira'sidwayàt,
nítyà yasya bhuwain chacára carada'n srí dévapálò nrĭpah.

The father of *Révà* is the *Mahéndra* mountain in the south, in which that river has its source; as the father of GAURI' is the *Himálaya* in the north, where IS'WARA, who has a *moon* on his forehead, is believed often to reside: hence RA'DHA'CA'NTA proposed a conjectural emendation, which would have done honour to SCALIGER or BENTLEY. Instead of *indra*, which is a name of the *sun*, he reads *indu*, or the *moon*, by changing only a small straight line into a small curve; and then the stanza will run thus:

By whose policy the great Prince DE'VAPA'LA made the earth tributary, from the father of *Révà*, whose-piles-of-rocks-are-moist-with-juice-from-the-heads-of-lascivious-elephants, to the-father-of-GAURI, whose-white-mountains-are-brightened-with-beams-from-the-moon-of-ISWARA,-*and* as far as the-two-oceans whose-waters-are-red-with-the-rising-and-with-the-setting-Sun.

The words connected by hyphens are compounds in *Sanscrit*.

P. 121. Verse VI. *Submission*—I understand *avasara* in this place to mean the *leisure* of the minister from public affairs, for which even the king waited at the head of his army.

P. 121. Verse VII. *Sums of Peetàs*—The common sense of *pit'ha* is a *chair*, *seat*, or *throne*; and in this sense it occurs in the thirteenth verse. *Ud'upachch'habipit"ham*, or *with-a-seat-as-bright-as-the-moon*, appears to be the compound epithet of *ásanam*, or *chair of state*, which though the king had often given to his minister, yet, abashed by his wisdom, and apprehensive of his popularity, he had himself ascended his throne *with fear*.

P. 121. Verse X. The tenth stanza is extremely difficult, as it contains many words with two meanings, applied in one sense to the Minister CE'DA'RA MIS'RA, but, in another, to CA'RTICE'YA, the *Indian* MARS: thus, in the first hemistich, *s'ic'hin* meas *fire*, or a *peacock*; *s'ic'há*, a *bright flame*, or a *crest*; and *s'acti*, either *power* or a *spear*. As the verse is differently understood, it may be a description of the *Bráhmen* or of the Deity.

P. 122. Verse XII. The *Bráhmans* of this province insist, that by the four *Vidyà's*, or branches of *knowledge*, are meant the four *Véda's*, not the *Upavéda's*, or *Medicine*, *Archery*, *Music*, and *Mechanics*; and they cite two distichs from the *Agnipuràna*, in which *eighteen Vidyà's* are enumerated, and among them the *four Védas*; *three* only of which are mentioned in the *Amarcósh*, and in several older books. In this verse also RA'DHA'CA'NT has displayed his critical sagacity: instead of *nála* he reads *bála*; and, if his conjecture be right, we must add, "*even* when he was a *boy*."

P. 123. Verse XVI. *Constant to her lord*—RA'DHA'CA'NT reads *anapatyayà*, or *childless*, for *anupatyayà*; SATI' having borne *no children* till she became regenerate in the person of PA'RVATI'.

P. 124. Verse XXIII. *It obstinately bore him no fruit*—The original stanza is uncommonly obscure: it begins with the words *yónirbabhúva*, the two first syllables of which certainly mean *a womb*; but several *Pandits*, who were consulted apart, are of opinion, that *yò* is the relative, of which some word in the masculine gender, signifying *speech*, is the antecedent, though not expressed: they explain the whole stanza thus:—"*That speech*, "which came forth (*nirbabhúva*) inconsiderately, of which *there was* "no fruit, *he was a man* who spoke nothing of that kind for his own grati-"fication: *he was a man* also, by whom no present-of-playthings was ever "*given*, which the suppliant having received goes to another *more bountiful* "giver." If the relative had been *yan* in the *neuter* gender, I should have acquiesced in the translation offered by the *Pandits*; but the suppression of so material a word as *speech*, which, indeed, is commonly *feminine* in *Sanscrit*, appears unwarrantably harsh according to *European* ideas of construction.

P. 124. Verse XXVI. If the preceding interpretation be just, the object of the pillar was to perpetuate the names of GURAVA MIS'RA and his ancestors; and this verse must imply, that *he expected to receive from his own sons the pious offices which he had performed to his forefathers.*

V.

SOME ACCOUNT OF THE SCULPTURES AND RUINS AT MAVALIPURAM,

A PLACE A FEW MILES NORTH OF SADRAS, AND KNOWN TO SEAMEN BY THE NAME OF THE SEVEN PAGODAS.

BY WILLIAM CHAMBERS, ESQ.

AS amidst inquiries after the histories and antiquities of *Asia* at large, those of that division of it in which this society resides, may seem on many accounts to lay claim to a particular share of its attention, a few hints put down from recollection, concerning some monuments of *Hindoo* antiquity, which, though situated in the neighbourhood of *European* settlements on the *Choromandel* coast, have hitherto been little observed, may it is conceived, be acceptable, at least as they may possibly give rise hereafter to more accurate observations, and more complete discoveries on the same subject. The writer of this account went first to view them in the year 1772, and curiosity led him thither again in 1776; but as he neither measured the distances nor size of the objects, nor committed to writing at the time the observations he made on them, he hopes to be excused if, after the lapse of so many years, his recollection should fail him in some respects, and his account fall far short of that precision and exactness, which might have been expected, had there then existed in *India* so powerful an incentive to diligent inquiry, and accurate communication, as the establishment of this society must now prove.

The monuments he means to describe, appear to be the remains of some great city, that has been ruined many centuries ago; they are situated close to the sea, between *Covelong* and *Sadras*, somewhat remote from the high road, that leads to the different *European* settlements. And when he visited them in 1776, there was still a native village adjoining to them, which retained the ancient name, and in which a number of *Brahmins* resided, that seemed perfectly well acquainted with the subjects of most of the sculptures to be seen there.

The rock, or rather hill of stone, on which great part of these works are executed, is one of the principal marks for mariners as they approach the coast, and to them the place is known by the name of the *Seven Pagados*, possibly because the summits of the rock have presented them with that idea as they passed: but it must be confessed, that no aspect which the hill assumes, as viewed on the shore, seems at all to authorize this notion; and there are circumstances, which will be mentioned in the sequel, that would lead one to suspect, that this name has arisen from some such number of Pagados that formerly stood here, and in time have been buried in the waves. But, be that as it may, the appellation by which the natives distinguish it, is of a quite different origin: in their language, which is the *Tamulic*, (improperly termed *Malabar*,) the place is called *Mâvalipuram*, which, in *Shanscrit*, and the languages of the more northern *Hindoos*, would be *Mahâbalipûr*, or the *City of the great Bali*. For the *Tamulians*, (or *Malabars*,) having no *h* in their alphabet, are under a necessity of shortening the *Shanscrit* word *mahâ*, *great*, and write it *mâ**. They are obliged also, for a similar reason, to substitute a *v* for a *b*, in words of *Shanscrit*, or other foreign original that begin with that letter; and the syllable *am*, at the end, is merely a termination, which, like *um* in *Latin*, is generally annexed to neuter substances†. To this etymology of the name of this place it may be proper to add, that *Bălĭ* is the name of a hero very famous in *Hindoo* romance; and that the river *Mávaligonga*, which waters the eastern side of *Ceylone*, where the *Tamulic* language also prevails, has probably taken its name from him, as, according to that orthography, it apparently signifies the *Ganges* of the great *Bălĭ*.

The rock, or hill of stone, above mentioned, is that which first engrosses the attention on approaching the place; for, as it rises abruptly out of a level plain of great extent, consists chiefly of one single stone, and is situated very near to the sea beach, it is such a kind of object as an inquisitive traveller would naturally turn aside to examine. Its shape is also singular and romantic, and, from a distant view, has an appearance like some antique and lofty edifice. On coming near to the foot of the rock from the north, works of imagery* and sculpture croud so thick upon the eye, as might seem to favour the idea of a petrified town, like those that have been fabled in different parts of the the world by too credulous travellers†. Proceeding on by the foot of the hill, on the side facing the sea, there is a pagoda rising out of the ground, of one solid stone, about sixteen or eighteen feet high, which seems to have been cut upon the spot out of a detached rock, that has been found of a proper size for that purpose. The top is arched, and the style of architecture, according to which it is formed, different from any now used in those parts. A little further on, there appears upon an huge surface of stone, that juts out a little from the side of the hill, a numerous group of human figures in bass relief, considerably larger than life, representing the most remarkable persons, whose actions are celebrated in the *Mahâbharit*, each of them in an attitude, or with weapons or other insignia, expressive of his character, or of some one of his most famous exploits. All these figures are, doubtless, much less distinct than they were at first; for, upon comparing these and the rest of the sculptures that are exposed to the sea air, with others at the same place, whose situation has afforded them protection from that element, the difference is striking; the former being every where much defaced, while the others are fresh as recently finished. This defacement is no where more observable, than in the piece of sculpture which occurs next in the order of description. This is an excavation in another part of the east side of the great rock, which appears to have been made on the same plan, and for the same purpose that Chowltries are usually built in that country; that is to say, for the accommodation of travellers. The rock is hollowed out to the size of a spacious room, and two or three rows of pillars are left, as a seeming support to the mountainous mass of stone which forms the roof. Of what pattern these pillars have originally been, it is not easy now to conjecture; for the air of the sea has greatly corroded them, as well as all the other parts of the

* They do indeed admit a substitute, but the abbreviation is most used.

† This explains also, why the *Shanscrit* word *Vêd*, by which the *Hindoos* denominate the books of the law of their religion, is written by the *Tamulians Vêdam*, which is according to the true orthography of their language, and no mistake of *European* travellers, as some have supposed; while the same word is called *Bêd* by the *Bengalies*, who have in effect no *V* in their alphabet.—See Dow, Vol. I. Dissert. P.41.

* Among these, one object, though a mean one, attracts the attention, on account of the grotesque and ridiculous nature of the design; it consists of two monkies cut out of one stone, one of them in a stooping posture, while the other is taking the insects out of his head.

† See SHAW'S Travels, P. 155, et seq.

cave. And this circumstance renders it difficult to discover, at first sight, that there is a scene of sculpture on the side fronting the entrance. The natives, however, point it out, and the subject of it is manifestly that of *Krishen* attending the herds of *Nund Ghose*, the *Admetus* of the *Hindoos;* from which circumstance, *Krishen* is also called *Gopaul*, or the cowherd, as *Apollo* was entitled *Nomius*.

The objects which seem next to claim regard, are those upon the hill itself, the ascent of which, on the north, is, from its natural shape, gradual and easy at first, and is in other parts rendered more so, by very excellent steps cut out in several places, where the communication would be difficult or impracticable without them. A winding stair of this sort leads to a kind of temple cut out of the solid rock, with some figures of idols in high relief upon its walls, very well finished, and perfectly fresh, as it faces the west, and is therefore sheltered from the sea air. From this temple again there are flights of steps, that seem to have led to some edifice, formerly standing upon the hill; nor does it seem absurd to suppose, that this may have been a palace, to which this temple, as a place of worship, may have appertained. For, besides the small detached ranges of stairs that are here and there cut in the rock, and seem as if they had once led to different parts of one great building, there appear in many places, small water channels cut also in the rock, as if for drains to an house; and the whole top of the hill is strewed with small round pieces of brick, which may be supposed, from their appearance, to have been worn down to their present form, during the lapse of many ages. On ascending the hill by its slope on the north, a very singular piece of sculpture presents itself to view. On a plain surface of the rock, which may once have served as the floor of some apartment, there is a platform of stone, about eight or nine feet long, by three or four wide, in a situation rather elevated, with two or three steps leading up to it, perfectly resembling a couch or bed, and a lion very well executed at the upper end of it by way of pillow, the whole of one piece, being part of the hill itself. This the *Brahmins*, inhabitants of the place, call *the bed of Dhermarâjah*, or *Judishter*, the eldest of the five brothers, whose fortunes and exploits are the leading subject in the *Mahabhârit*. And at a considerable distance from this, at such a distance, indeed, as the apartment of the women might be supposed to be from that of the men, is a bath excavated also from the solid rock, with steps in the inside, which the *Brahmins* call the bath of *Dropedy*, the wife of *Judishter* and his brothers. How much credit is due to this tradition, and whether this stone couch may not have been anciently used as a kind of throne rather than a bed, is matter for future inquiry. A circumstance, however, which may, seem to favour this idea is, that a throne in the *Shanscrit*, and other *Hindoo* languages, is called *Singhâsen*, which is composed of the words *Singh*, a lion; and *âsen*, a seat.

These are all that appear on that part of the upper surface of the hill, the ascent to which is on the north; but, on descending from thence, you are led round the hill to the opposite side, in which there are steps cut from the bottom to a place near the summit, where is an excavation that seems to have been intended for a place of worship, and contains various sculptures of *Hindoo* Deities. The most remarkable of these, is a gigantic figure of *Vishnoo*, asleep on a kind of bed, with a huge snake wound about in many coils by way of pillow for his head; and these figures, according to the manner of this place, are all of one piece, hewn from the body of the rock.

But though these works may be deemed stupendous, they are surpassed by others that are to be seen at the distance of about a mile, or a mile and an half, to the southward of the hill. They consist of two Pagodas, of about thirty feet long by twenty feet wide, and about as many in heighth, cut out of the solid rock, and each consisting originally of one single stone. Near these also stand an elephant full as big as life, and a lion much larger than the natural size, but very well executed, each hewn also out of one stone. None of the pieces that have fallen off in cutting these extraordinary sculptures, are now to be found near or any where in the neighbourhood of them, so that there is no means of ascertaining the degree of labour and time that has been spent upon them, nor the size of the rock or rocks from which they have been hewn, a circumstance which renders their appearance the more striking and singular. And though their situation is very near the sea-beach, they have not suffered at all by the corrosive air of that element, which has provided them with a defence against itself, by throwing up before them a high bank, that completely shelters them. There is also great symmetry in their form; though that of the Pagodas is different from the style of architecture, according to which idol temples are now built in that country. The latter resembles the *Egyptian;* for the towers are always pyramidical, and the gates and roofs flat, and without arches; but these sculptures approach nearer to the *Gothic* taste, being surmounted by arched roofs or domes, that are not semicircular, but composed of two segments of circles meeting in a point at top. It is also observable that the lion in this group of sculptures, as well as that upon the stone couch above mentioned, are perfectly just representations of the true lion; and the natives there give them the name, which is always understood to mean a lion in the *Hindoo* language, to wit, *Singh*; but the figure, which they have made to represent that animal in their idol temples for centuries past, though it bears the same appellation, is a distorted monster, totally unlike the original; insomuch that it has from hence been supposed that the lion was not anciently known in this country, and that *Singh* was a name given to a monster that existed only in *Hindoo* romance. But it is plain that that animal was well known to the authors of these works, who, in manners as well as arts, seem to have differed much from the modern *Hindoos.*

There are two circumstances attending these monuments, which cannot but excite great curiosity, and on which future inquiries may possibly throw some light. One is, that, on one of the Pagodas last mentioned, there is an inscription of a single line, in a character at present unkown to the *Hindoos.* It resembles neither the *Deyva-nâgre*, nor any of the various characters connected with or derived from it, which have come to the writer's knowledge from any part of *Hindostan.* Nor did it, at the time he viewed it, appear to correspond with any character, *Asiatic* or *European*, that is commonly known. He had not then, however, seen the alphabet of the *Balic*, the learned language of the *Siamese*, a sight of which has since raised in his mind a suspicion, that there is a near affinity between them, if the character be not identically the same. But as these conjectures, after such a lapse of time, are somewhat vague, and the subject of them is perhaps

yet within the reach of our researches, it is to be hoped that some method may be fallen upon of procuring an exact copy of this inscription.

The other circumstance is, that though the outward form of the Pagodas is complete, the ultimate design of them has manifestly not been accomplished, but seems to have been defeated by some extraordinary convulsion of nature. For the western side of the most northerly one, is excavated to the depth of four or five feet, and a row of pillars left on the outside to support the roof; but here the work has been stopped, and an uniform rent of about four inches breadth has been made throughout the solid rock, and appears to extend to its foundations, which are probably at a prodigious depth below the surface of the ground. That this rent has happened since the work begun, or while it was carrying on, cannot be doubted; for the marks of the mason's tools are perfectly visible in the excavated part on both sides of the rent, in such a manner as to show plainly that they have been divided by it. Nor is it reasonable to suppose that such a work would ever have been designed, or begun, upon a rock that had previously been rent in two.

Nothing less than an earthquake, and that a violent one, could apparently have produced such a fissure in the solid rock: and that this has been the case in point of fact, may be gathered from other circumstances, which it is necessary to mention in an account of this curious place.

The great rock above described is at some small distance from the sea, perhaps fifty or an hundred yards, and in that space the *Hindoo* village before mentioned stood in 1776. But close to the sea are the remains of a Pagoda, built of brick, and dedicated to *Sib*, the greatest part of which has evidently been swallowed up by that element; for the door of the innermost apartment, in which the idol is placed, and before which there are always two or three spacious courts surrounded with walls, is now washed by the waves; and the pillar used to discover the meridian at the time of founding the Pagoda* is seen standing at some distance in the sea. In the neighbourhood of this building there are some detached rocks,

* See Voyage du M. Gentil, Vol. I. Page 158.

washed also by the waves, on which there appear sculptures, though now much worn and defaced. And the natives of the place declared to the writer of this account, that the more aged people among them remembered to have seen the tops of several Pagodas far out in the sea, which being covered with copper (probably gilt) were particularly visible at sun rise, as their shining surface used then to reflect the sun's rays, but that now that effect was no longer produced, as the copper had since become incrusted with mould and verdegrease.

These circumstances look much like the effects of a sudden inundation; and the rent in the rock above described makes it reasonable to conjecture, that an earthquake may have caused the sea to overflow its boundaries, and that these two formidable enemies may have joined, to destroy this once magnificent city. The account which the *Brahmins*, natives of the place, gave of its origin and downfal, partly, it should seem, on the authority of the *Mahabhârit*, and partly on that of later records, at the same time that it countenances this idea, contains some other curious particulars, which may seem to render it worthy of attention. Nor ought it to be rejected on account of that fabulous garb, in which all nations, but especially those of the east, have always clad the events of early ages.

"*Hirinâcheren* (said they) was a gigantic prince, that rolled "up the earth into a shapeless mass, and carried it down to the "abyss, whither *Vishnoo* followed him in the shape of an hog, "killed him with his tusks, and replaced the earth in its original "situation. The younger brother of *Hirinâcheren* was *Hirinakas-* "*sap*, who succeeded him in his kingdom, and refused to do homage "to *Vishnoo*. He had a son named *Pralhaud*, who at an early "age openly disapproved this part of his father's conduct, being "under the tuition of *Sokerâchârj*. His father persecuted him on "this account, banished him, and even sought to kill him, but was "prevented by the interposition of heaven, which appeared on "the side of *Pralhaud*. At length *Hirinakassap* was softened, "and recalled his son to his court, where, as he sat in full assembly, "he began again to argue with him against the supremacy of "*Vishnoo*, boasted that he himself was lord of all the visible world,

"and asked what *Vishnoo* could pretend to more. *Pralhaud* re- "plied, that *Vishnoo* had no fixed abode, but was present every "where. Is he, said his father, in that pillar? Yes, returned *Pral-* "*haud*. Then let him come forth, said *Hirinakassap*; and, rising "from his seat, struck the pillar with his foot; upon which *Vishnoo*, "in the *Narasinghah Awtâr*, that is to say, with a body like a man, "but an head like a lion, came out of the pillar, and tore *Hirina-* "*kassap* in pieces. *Vishnoo* then fixed *Pralhaud* on his father's "throne; and his reign was a mild and virtuous one, and as such "was a contrast to that of his father. He left a son named *Nama-* "*chee*, who inherited his power and his virtues, and was the father "of *Balee*, the founder of the once magnificent city of *Mahâbali-* "*poor*, the situation of which is said to be described in the following "verse, taken from the *Mahabhârit*.

গঙ্গায়াঃ দক্ষিণেভাগে যোজনানাং শতদ্বয়ং
পঞ্চযোজন মাত্রো পূর্ব্বাব্ধিস্তু পশ্চিমে।

The sense of which is literally this:

"South of the *Ganges* two hundred Yojen
"Five Yojen* westward from the eastern sea.

Such is the *Brahmin* account of the *origin* of this place. The *sequel* of its history, according to them, is as follows:

"The son of *Balee* was *Banâcheren*, who is represented as a "giant with a thousand hands. *Anuredh*, the son of *Krishen*, came "to his court in disguise, and seduced his daughter; which pro- "duced a war, in the course of which *Anuredh* was taken prisoner, "and brought to *Mahâbalipoor*; upon which *Krishen* came in "person from his capital *Duârikah*, and laid siege to the place. "*Sîb* guarded the gates, and fought for *Banâcheren*, who worship-

* The *Yojen* is a measure often mentioned in the *Shanscrit* books, and, according to some accounts, is equal to nine, according to others twelve *English* miles. But at that rate the distance here mentioned, between this place and the *Ganges*, is prodigiously exaggerated, and will carry us far south of *Ceylone*. This, however, is not surprising in an *Hindoo* poem; but, from the second line it seems pretty clear, that this city, at the time this verse was composed, must have stood at a great distance from the sea.

"ped him with his thousand hands; but *Krishen* found means to "overthrow *Sîb*, and having taken the city, cut off all *Banâcheren's* "hands, except two, with which he obliged him to do him homage. "He continued in subjection to *Krishen* till his death; after which "a long period ensued, in which no mention is any where made "of this place, till a prince arose, whose name was *Malêcheren*, who "restored the kingdom to great splendour, and enlarged and beau-"tified the capital. But in his time the calamity is said to have "happened by which the city was entirely destroyed; and the "cause and manner of it have been wrapt up by the *Brahmins* in "the following fabulous narration. *Malêcheren*, (say they,) in an "excursion which he made one day alone, and in disguise, came to "a garden in the environs of the city, where was a fountain so "inviting, that two celestial nymphs had come down to bathe there. "The *Rajah* became enamoured of one of them, who condescended "to allow of his attachment to her; and she and her sister nymph "used thenceforward to have frequent interviews with him in that "garden. On one of those occasions, they brought with them a "male inhabitant of the heavenly regions, to whom they intro-"duced the *Rajah;* and between him and *Malêcheren* a strict "friendship ensued; in consequence of which he agreed, at the "*Rajah's* earnest request, to carry him in disguise to see the court "of the divine *Inder*, a favour never before granted to any mortal. "The *Rajah* returned from thence with new ideas of splendour and "magnificence, which he immediately adopted in regulating his "court, and his retinue, and in beautifying his seat of government. "By this means *Mahâbalipoor* became soon celebrated beyond all "the cities of the earth; and an account of its magnificence "having been brought to the gods assembled at the court of *Inder*, "their jealousy was so much excited at it, that they sent orders to "the God of the Sea to let loose his billows, and overflow a place "which impiously pretended to vie in splendour with their celestial "mansions. This command he obeyed, and the city was at once "overflowed by that furious element, nor has it ever since been able "to rear its head."

Such is the mode in which the *Brahmins* choose to account for the signal overthrow of a place devoted to their wretched superstitions.

It is not, however, improbable, that the rest of this history may contain, like the mythology of *Greece* and *Rome*, a great deal of real matter of fact, though enveloped in dark and figurative representations. Through the disguise of these we may discern some imperfect records of great events, and of revolutions that have happened in remote times; and they perhaps merit our attention the more, as it is not likely that any records of ancient *Hindoo* history exist but in this obscure and fantastic dress. Their poets seem to have been their only historians, as well as divines; and whatever they relate, is wrapped up in this burlesque garb, set off, by way of ornament, with circumstances hugely incredible and absurd, and all this without any date, and in no other order or method, than such as the poet's fancy suggested, and found most convenient. Nevertheless, by comparing names and grand events, recorded by them, with those interspersed in the histories of other nations, and by calling in the assistance of ancient monuments, coins, and inscriptions, as occasion shall offer, some probable conjectures, at least, if not important discoveries, may, it is hoped, be made on these interesting subjects. It is much to be regretted, that a blind zeal, attended with a total want of curiosity, in the *Mohammedan* governors of this country, have been so hostile to the preservation of *Hindoo* monuments and coins. But a spirit of inquiry among *Europeans* may yet perhaps be successful; and an instance, which relates to the place above described, though in itself a subject of regret, leaves room to hope that futurity may yet have in store some useful discoveries. The *Kauzy* of *Madras*, who had often occasion to go to a place in the neighbourhood of *Mahâbalipoor*, assured the writer of this account, that within his remembrance a ryot of those parts had found, in plowing his ground, a pot of gold and silver coins, with characters on them which no one in those parts, *Hindoo* or *Mohammedan*, was able to decypher. He added, however, that all search for them would now be vain, for they had doubtless been long ago devoted to the crucible, as, in their original form, no one there thought them of any value.

The inscription on the Pagoda mentioned above, is an object which, in this point of view, appears to merit great attention. That the conjecture, however, which places it among the languages of *Siam*, may not seem in itself chimerical, the following passages from some authors of repute are here inserted, to show, that the idea of a communication having formerly subsisted between that country and the coast of *Choromandel*, is by no means without foundation; nay, that there is some affinity, even at this day, between the *Balic* and some of the *Hindoo* languages: and that the same mode of worship seems formerly to have prevailed in the *Deckan*, which is now used by the *Siamese*.

MONSIEUR DE LA LOUBERE, in his excellent account of *Siam*, speaks thus of the origin of the *Balic* language.

"The Siamese, says he, do not mention any country where the "Balic language, which is that of their laws and their religion, is at "present in use. They suppose, indeed, on the report of some "among them, who have been on the coast of Choromandel, that it "bears some resemblance to some of the dialects of that country; "but they at the same time allow, that the character in which it is "written is not known but among themselves. The secular Mis-"sionaries settled at Siam believe that this language is not entirely "a dead one; because they have seen in their hospital a man from "the neighbourhood of Cape Comorin, who mixed several Balic "words in his discourse, declaring that they were in use in his "country, and that he himself had never studied nor knew any "other than his mother tongue. They at the same time mention, "as matter of certainty, that the religion of the Siamese comes from "those parts; as they have read in a Balic book that Sommonaco-"dom, the idol of the Siamese, was the son of a King of Ceylone*."

The language of the man mentioned in this passage, who came from the neighbourhood of *Cape Comorin*, could be no other than the *Tamulic*; but the words here alluded to may very possibly have been derivatives from the *Shanscrit*, common to both that and the *Balic*.

* "Leis Siamois ne nomment aucun Pais, ou la langue Bali qui est celle de leurs loix et "de leur religion, soit aujourdhuy en usage. Ils soupconnent a la verite, sur le rapport de "quelques-uns d'entre eux, qui ont ete a la côte de Coromandel, que la langue Balic a quelque "resemblance avec quelqu'un des dialects de ce pais la: mais ils conviennent en même temps "que les lettres de la langue Balic ne sont connues que chez eux. Les Missionaires séculiers "a Siam croyent que cette langue n'est pas entierement morte; parce qu'ils ont vu dans leur "hopital un homme des environs du Cap de Comorin, qui metoit plusiers mots Balis dans "son langage, assurant qu'ils etoient en usage en son pais, et que luy n'avoit jamais etudié, et "ne savoit que sa langue maternelle. Ils donnent d'ailleurs pour certain que la religion des "Siamois vient de ces quartiers la, parce qu'ils ont lu dans un livre Balic que Sommonacodom "que les Siamois adorent, etoit fils d'un Roy de l'isle de Ceylone."

In another part of the same work, where the author treats of the history of *Sommonacodom* at large, on the authority of the *Balic* books, he says:

"The father of Sommonacodom, according to the same Balic "book, was a King of Teve Lanca, that is to say of the famous "Ceylone*."

Here it is observable, that, while the country of *Siam* seems to be utterly unknown, both to the natives of *Ceylone* and *Hindostan*, *Ceylone*, should nevertheless be so well known to the *Siamese*, and under the same appellation it bears in the *Shanscrit*. An epithet is also here prefixed to it, which seems to be the same as that used by the *Hindoos* in speaking of that island; for they also call it, in *Shanscrit*, *Dêve Lanca*, or *the Sacred Lanca*. From several passages in the same work it also appears, that the *Shanscrit* word *Mahâ*, which signifies *great*, is constantly used in the *Balic* language in the same sense. And the names of the days of the week are most of them the same in *Shanscrit* and in *Balic*, as may be seen in the following comparison of them.

Shanscrit.	*Balic.*	
Aditta-vâr,	Van Athit,	Sunday.
Soma-vâr,	Van† Tchân,	Monday.
Mungela-vâr,	Van Angkaan,	Tuesday.
Bouta-vâr,	Van Pout,	Wednesday.
Brahspati-vâr,	Van Prahout,	Thursday.
Soucra-vâr,	Van Souc,	Friday.
Sany-vâr,	Van Sâoa,	Saturday.

The same author gives, in another place, an account of a pretended print of a foot on a rock, which is an object of worship to the *Siamese*, and is called *Prabât*, or the venerable foot. For *prâ*, in *Balic*, he says, signifies *venerable*, which agrees with *prâper* and *pramesht* in *Shanscrit*; and *bât* in the same tongue is a foot, as *pâd* in *Shanscrit*. After which he goes on to say:

"We know that in the island of Ceylone, there is a pretended "print of a human foot, which has long been held in great venera-

* "Le pere de Sommonacodom etoit, selon ce mesme livre Bali, un Roy de Teve Lanca, cést a dire un Roy de la celebre Ceylan."

† Here one *Hindoo* word is substituted for another; for *Tchân* in *Hindostany*, and *Tchânder* in *Shanscrit*, signify the moon as well as *Soma*.

"tion. It represents, doubtless, the left foot; for the Siamese say "that Sommonacodom set his right foot on their *Prabat*, and his left "foot at Lanca*."

From KNOX'S History of *Ceylone* it appears, that the impression here spoken of is upon the hill called, by the *Chingelays*, *Hamalell;* by *Europeans*, *Adam's Peak;* and that the natives believe it to be the foot-step of their great idol *Buddou;* between the worship of whom, as described by KNOX, and that of *Sommonacodom*, as related by M. DE LA LOUBERE, there is a striking resemblance in many particulars, which it may be proper here to enumerate.

1st. Besides the foot-steps above mentioned, there is a kind of tree (which, from description, appears to be the *Pipel* tree, so well known in *India)* which the *Chingelays* hold sacred to *Buddou*, and the *Siamese* to *Sommonacodom;* insomuch that the latter deem it meritorious to hang themselves upon it. The *Chingelays* call it *Bogahah;* for *gahah*, in their language, signifies a tree; and *bo* seems to be an abbreviation of *Bod* or *Buddou;* and the *Siamese* call it, in *Balic*, *Pra si Mahà Pout*, which, according to DE LA LOUBERE'S interpretation, signifies the tree of the great *Pout*†. This he supposes to mean *Mercury;* for he observes that *Pout*, or *Poot*, is the name of that planet in the *Balic* term for *Wednesday;* and in another place, he says, *Pout* is one of the names of *Sommonacodom*. It is certain that *Wednesday* is called the name of *Bod*, or *Budd*, in all the *Hindoo* languages, among which the *Tamulic*, having no *b*, begins the word with a *p*, which brings it very near the *Balic* mode of writing it. It is equally certain that the days of the week, in all these languages, are called after the planets in the same order as with us; and that *Bod*, *Budd*, or *Pood*, holds the place of *Mercury*. From all which it should appear that *Pout*, which, among the *Siamese*, is another name for *Sommonacodom*, is itself a corruption of *Buddou*, who is the *Mercury* of the *Greeks*. And it is singular that, according to M. DE LA LOUBERE, the mother of *Sommonacodom* is called, in *Balic*,

* "On fait que dans l'isle de Ceylan, il y a un pretendu vestige de pié humain, que "depuis long temps y est en grande veneration. Il represente sans doute le pie gauche; car "les Siamois disent que Sommonacodom posa le pie droit a leur *prabat*, et le pie gauche a "Lancà."

† In vulgar *Siamese* they call it *Ton-pô*.

Maha-mania, or the *great Mania*, which resembles much the name of *Maia* the mother of *Mercury*. At the same time that the *Tamulic* termination *en*, which renders the word *Pooden*, creates a resemblance between this and the *Woden* of the *Gothic* nations, from which the same day of the week is denominated, and which, on that and other accounts, is allowed to be the *Mercury* of the *Greeks*.

2dly. The temples of *Sommonacodom* are called *Pihân;* and round them are habitations for the priests, resembling a college; so those of *Buddou* are called *Vihâr*, and the principal priests live in them as in a college. The word *Vihâr*, or, as the natives of *Bengal* would write it, *Bihâr*, is *Shanscrit;* and FERISHTAH, in his History of *Bengal*, says, that this name was given by the *Hindoos* to the Province of *Behâr*, because it was formerly so full of *Brahmins*, as to be, as it were, one great *seminary of Learning*, as the word imports.

3dly. The *Siamese* have two orders of priests, and so have the worshippers of *Buddou*. Both the one and the other are distinguished by a yellow habit, and by another circumstance, which must be mentioned in the words of the respective authors. KNOX says of the *Buddou* Priests, "They have the honour of carrying "the *Tallipot* with the broad end over their heads foremost, which "none but the King does." And M. DE LA LOUBERE says of the *Siamese* priests, "To defend themselves from the sun they have "the *Talapat*, which is their little umbrella, in the form of a "screen*."

The word here used is common to most of the *Hindoo* languages, and signifies *the leaf of the Palmyra tree*. M. DE LA LOUBERE mentions it as a *Siamese* word, without seeming to know its origin or primary signification.

4thly. The priests of *Buddou*, as well as those of *Sommonacodom*, are bound to celibacy, as long as they continue in the profession; but both the one and the other are allowed to lay it down and marry.

5thly. They both eat flesh, but will not kill the animal.

* "Pour se garentir du soleil ils ont le Talapat, qui est leur petit parasol en forme "d'ceran."

6thly. The priests of either nation are of no particular tribe, but are chosen out of the body of the people.

These circumstances plainly show that this is a system of religion different from that of the *Vêds;* and some of them are totally inconsistent with the principles and practice of the *Brahmins.* And, indeed, it is manifest, from KNOX'S whole account, that the religion of the *Chingelays* is quite distinct from that which prevails at this day among the *Hindoos*, nor does it appear that there is such a race of men as that of the *Brahmins* among them. The only part in which there seems to be any agreement is in the worship of the *Debtahs*, which has probably crept in among them from their *Tamulian* neighbours; but that is carried on in a manner very different from the *Brahminical* system, and appears to be held by the nation at large in very great contempt, if not abhorrence. KNOX'S account of it is this: "Their temples (i. e. those of the *Debtahs*) are, he says, "called *Covels*," which is the *Tamulic* word for *Pagoda.* He then goes on to say, "A man piously dis-"posed, builds a small house at his own charge, which is the *temple*, "and *himself becomes priest thereof.* This house is seldom called "*God's House*, but most usually *Jacco*, the *Devil's.*" But of the prevailing religion he speaks in very different terms, and describes it as carried on with much parade and splendour, and attended with marks of great antiquity. "The pagodas, or temples of their gods, "says he, are so many that I cannot number them. Many of them "are of rare and exquisite work, built of hewn stone, engraven "with images and figures; but by whom, and when, I could not "attain to know, the inhabitants themselves being ignorant therein. "But sure I am, they were built by far more ingenious artificers "than the Chingelays that now are on the land. For the Portu-"guese, in their invasions, have defaced some of them, which there "is none found that hath skill enough to repair to this day." In an other place, he says, "Here are some ancient writings, engraven, "upon rocks, which puzzle all that see them. There are divers great "rocks in divers parts in *Cande Uda*, and in the northern parts. "These rocks are cut deep with great letters for the space of some "yards, so deep that they may last to the world's end. No body "can read them, or make any thing of them. I have asked Mala-"bars and Gentoos, as well as Chingelays and Moors, but none of

"them understood them. There an ancient temple, Goddiladenni "in Yattanour, stands by a place where there are these "letters." From all which the antiquity of the nation and their religion is sufficiently evident; and from other passages it is plain, that the worship of *Buddou*, in particular, has been from remote times a very eminent part of that religion; for the same author, speaking of the tree at *Anurodgburro*, in the northern part of the island, which is sacred to *Buddou*, says, "The due per-"formance of this worship they reckon not a little meritorious; "insomuch that as they report, ninety Kings have reigned there "successively, where, by the ruins that still remain, it appears they "spared not for pains and labour, to build temples and high "monuments to the honour of this God, as if they had been born "to hew rocks and great stones, and lay them up in heaps. These "Kings are now happy spirits, having merited it by these labours." And again he says, "For this God, above all other, they seem to "have an high respect and devotion," &c.

And from other authorities it will appear, that this worship has formerly been by no means confined to *Ceylone*, but has prevailed in several parts of *India* prior to that of the *Brahmins;* nay, that this has been the case even so late as the ninth and twelfth centuries of the *Christian* Æra.

In the well-known* *Anciennes Relations*, translated from the *Arabic*, by that eminent orientalist EUSEBIUS RENAUDOT, that the *Arabian* traveller gives this account of the custom of dancing-women, which continues to this day in the *Decan*, but is not known among the *Hindoos* of *Bengal*, or *Hindostan* proper.

"There are in India public women, called *women of the idol*, "and the origin of this custom is this: when a woman has made "a vow for the purpose of having children, if she brings into the "world a pretty daughter, she carries it to *Bod*, (so they call the "idol which they adore,) and leaves it with him †."

This is a pretty just account of this custom, as it prevails at

* Anciennes Relations des Indes et de la Chine, de deux Voyageurs Mohametans, qui y allerent dans le neuvieme Siecle. *Paris* 1718, 8vo.

† "Il y a dans les Indes des femmes publiques, appellés, femmes de l'idole, l'origine de "cette coustume est telle: Lors qu'une femme a fait un voeu pour avoir des enfans, si elle "met au monde une belle fille, elle l'apporte au *Bod*, c'est ainsi qu'ils appellent l'idole qu'ils "adorent, aupres duquel elle la laisse, &c. Anc. Rel. p. 109.

this day in the *Decan;* for children are, indeed, devoted to this profession by their parents, and when they grow up in it, they are called, in *Tamulic*, *Devadâsi*, or *female slaves of the idol.* But it is evident they have changed their master since this *Arabian* account was written, for there is no idol of the name of *Bod* now worshipped there. And the circumstance of this custom being unknown in other parts of *India*, would lead one to suspect, that the *Brahmins*, on introducing their system of religion into that country, had thought fit to retain this part of the former worship, as being equally agreeable to themselves and their new disciples.

The same *Arabian* travellers give us an account of a very powerful race of *Hindoo* kings, according to them, indeed, the most powerful in *India*, who then reigned on the *Malabar* coast with the title of *Balhâra.* Their dominion appears to have extended over *Guzerat*, and the greatest part, if not the whole, of the ancient kingdom of *Visiapoor.* For the *Arabian* geographer quoted by M. RENAUDOT, makes *Nahelvârah* the metropolis of these princes, which is, doubtless, *Nahervalah*, the ancient capital of *Guzerat;* though M. RENAUDOT seems not to have known that place; and the rest of the description sufficiently shows the great extent of their dominion southward. M. D'ANVILLE speaks of this race of kings on the authority of the *Arabian* geographer EDRISI, who wrote in the twelfth century, according to whom it appears, that their religion was, even so late as that period, not the *Brahminical*, but that of which we are now speaking. M. D'ANVILLE'S words are these: "Edrisi acquaints us with the religion which this Prince "professed in saying, that his worship was addressed to *Bodda*, "who, according to St. Jerome and Clemens Alexandrinus, was "the founder of the sect of the Gymnosophists, in like manner as "the Brahmins were used to attribute their institution to Brahma*."

The authority of CLEMENS ALEXANDRINUS is also cited on the same subject by RELANDUS in his 11th Dissertation, where, treating of the language of *Ceylone*, he explains the word *Vehâr*, above spoken of, in these terms.

* "L'Edrisi nous instruit sur la religion que professoit ce Prince, en disant que son culte "s'adressoit a Bodda, que selon St. JEROME and St. CLEMENT D' ALEXANDRIE, avoit ete "l'instituteur des Gymnosophistes comme les Brachmanes rapportoient a Brahma leur "institut." Ant. Geog. de L'Inde, p. 94.

"Vehâr signifies a temple of their principal God Buddou, who, "as Clemens Alexandrinus has long ago observed, was worshipped "as a God by the Hindoos*."

After the above quotations, the following extract from the voyage of that inquisitive and ingenious traveller M. GENTIL, published in 1779, is given as a further and very remarkable illustration of this subject.

"This system is also that of the Brahmins of our time; it forms "the basis of that religion, which they have brought with them into "the southern parts of the Peninsula of Hindostan, into Madura, Tanjore, and Maissore.

"There was then in those parts of India, and principally on "the Coast of Choromandel and Ceylone, a sort of worship, the "precepts of which we are quite unacquainted with. The God, "Baouth, of whom at present they know no more in India than the "name, was the object of this worship; but it is now totally "abolished, except that there may possibly yet be found some "families of Indians, who have remained faithful to Baouth, and do "not acknowledge the religion of the Brahmins, and who are on "that account separated from and despised by the other casts.

"I have not, indeed, heard that there are any such families in "the neighbourhood of Pondichery; but there is a circumstance "well worthy of remark, which none of the travellers that have "treated of the Coast of Choromandel and Pondichery seem to "have noticed. It is this, that at a short league's distance to the "south of this town, in the plain of Virapatnam, and pretty near "the river, we find a statue of granite very hard and beautiful. "This statue, which is from three feet to three and a half in heighth, "is sunk in the sand to the waist, and weighs doubtless many thou-"sand weight; it is, as it were abandoned in the midst of this "extensive plain. I cannot give a better idea of it, than by saying, "that it exactly agrees with and resembles the Sommonacodom "of the Siamese; its head is of the same form, it has the same "features, its arms are in the same attitude, and its ears are exactly "similar. The form of this divinity, which has certainly been

* "*Vehâr*, templum dei primarii Buddoe βουττα quem Indos ut Deum venerari jam olim "notavit Clemens Alexandrinus. Strom. lib. 1. p. 223. Rel. Diss. pars tertia, p. 85.

"made in the country, and which in no respect resembles the pre-"sent idols of the Gentoos, struck me as I passed this plain. I "made various inquiries concerning this singular figure, and the "Tamulians, one and all, assured me that this was the God Baouth, "who was now no longer regarded, for that his worship and his "festivals had been abolished ever since the Brahmins had made "themselves masters of the people's faith*."

M. GENTIL then goes on to say a good deal more upon this subject, in the course of which he supposes, that this Deity is the *Fo* of the *Chinese*, whose worship, by their own accounts, was brought from *India*. And, indeed, the abridgment of the name *Pout*, mentioned in a note of this paper, which the vulgar *Siamese* reduce to the single syllable *Po*, seems to countenance this opinion. But as this is foreign to our present purpose, and the above passages, it is hoped, are sufficient to establish what was proposed, it seems high time to take leave of this subject, with an apology for that prolixity, which is inseparable from this kind of discussion.

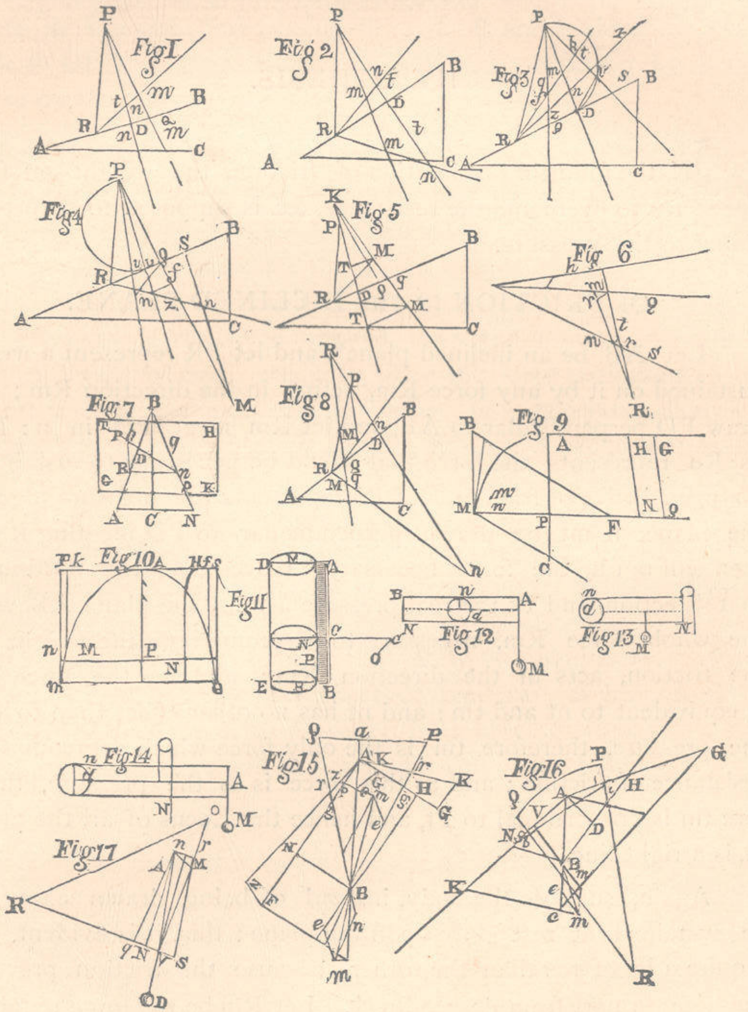
17th june, 1784.

* "Ce systeme est aussi celui des Brames de nos jours ; il fait la Base de la religion qu'ils "ont aportee dans le sud de la presqu'isle de l'Indostan, le Madure, le Tanjaour, et le Maissour.

"Il y avoit alors dans ces parties de l'Inde, & principalement a la Côte de Coromandel & "a Ceylan, un Culte dont on ignore absolument les Dogmes : le Dieu Baouth, dont on ne "connoit aujourd'hui, dans l'Inde, que le Nom, etoit l'objet de ce Culte ; mais il est tout-a-"fait aboli, si ce n'est qu'il se trouve encore quelques familles d'Indiens séparés & méprisées "des autres Castes, qui sont restées fideles à Baouth, & qui ne reconnoissent point la religion "des Brames.

"Je n'ai pas entendu dire qu'il y ait de ces familles aux environs de Pondichery ; cepen-"dant, une chose tres digne de remarque, & a laquelle aucun des Voyageurs qui parlent de la "Côte de Coromandel & de Pondichery, n'ont fait attention, est que l'on trouve a une petite "lieue au sud de cette Ville, dens la plaine de Virapatnam, assez pres de la Riviere, une statue "de *Granit* tres-dur & tres-beau : cette statue, d'enveron trois pieds a trois pieds & demi de "hauteur, est enfoncée dans le sable jusqu' a la Ceinture, & pese sans doute plusieurs Milliers ; "elle est comme abandonnée au milieu de cette vaste plaine : je ne peux mieux en donner une idée, "qu'en disant qu'elle est exactement conforme & ressemblante a *Sommonacodom* des Siamois ; "c'est la même Forme de Tête, ce sont les mêmes traits dans le Visage, c'est la même attitude "dans les Bras, & les Oreilles sont absolument semblables. La forme de cette divinite, qui "certainement a été faite dans le pays, & qui ne ressemble en rien aux divinités actuelles des "Gentils, m'avoit frappélorsque je passai dans cette plaine ; je fis diverses informations sur "cette figure singuliere, les Tamoults m'assurerent tous que c'etoit Baouth qu' on ne regardoit "plus ; que son Culte & ses fêtes etoient cessées depuis que les Brames s'etoient rendus les "Maitres de la Croyance du peuple."

VOL I



VI.

HINTS RELATIVE TO FRICTION IN MECHANICS.

BY MR. REUBEN BURROW.

HYPOTHESIS.

IN the following estimation of friction, the weight or force necessary to overcome the resistance, &c. is supposed to be proportional to the pressure.

OF FRICTION IN THE INCLINED PLANE.

Let AB be an inclined plane*, and let PR represent a weight sustained on it by any force Rm, acting in the direction Rm; and draw PD perpendicular to AB, and let Rm meet PD in n: Now as Rn represents the force that would be necessary to sustain the body, exclusive of friction, and Pn represents the pressure against the plane, if mt be drawn perpendicular to PD meeting it in t, then will nm be the force necessary to overcome the friction in that direction, and Pt the real pressure against the plane AB, when the whole force Rm, necessary to overcome both the weight and the friction, acts in the direction Rm; and as the force nm is equivalent to nt and tm; and nt has no other effect than to alter the pressure, therefore tm is the only force which overcomes the resistance of friction; and as this force is as the pressure, therefore tm is proportional to Pt, and hence the Locus of all the points m, is a right line.

Again, suppose the body, instead of being drawn along, to be sustained at rest only upon the plane; this, it is evident, will require a less force than the other, because the friction prevents the body in part from descending†. Let Rm be the force required, and let the same construction be made as before; then because Rn is the force that would be necessary if there was no friction; mn is the effect of the friction itself; but mn is equivalent to the

* Fig. 1.

† Fig. 2.

forces mt and tn; and as Pn would be the pressure, exclusive of friction, Pt is the pressure inclusive; and as the force lost is as the friction, and mt is as the force lost, therefore mt is as Pt, for the friction is as the pressure; consequently the Locus of all the points m is a right line passing through P, and making the same angle as DPQ in the former case, and only differing by being drawn on the contrary side of PD.

SCHOLIUM.

In what follows, the force requisite to sustain any body is considered under three different distinctions; first, when it is just barely sufficient to overcome the weight and resistance arising from friction, and the body is considered as just beginning to move in the direction of the force applied, and the force in this case is called the *moving force*: secondly, when this force is diminished till the body would begin to move or descend in a contrary direction, if the force was diminished farther; this last I called the *suspending force;* and it is plain that whatever force is applied to the body less than the moving, and greater than the suspending force, the body will remain at rest: lastly, it is manifest that there is an intermediate state in which such a degree of force may be applied, that the friction will have no effect either way; and this force is the same as would keep the body in equilibrio if there was no friction, because the effect or tendency of friction is to keep the body at rest, or prevent it from moving either way; this being premised, there will be little difficulty in the following.

PROBLEM I.

Having given the weight of the body to be sustained; the inclination of the plane and the ratio of the friction to the pressure; to find the force requisite to sustain the weight in a given direction.

In the foregoing figures, draw PR and PD at right angles to the horizon and plane respectively, PR representing the weight; take PD to DQ as the pressure to the friction, and let DQ be taken upwards or downwards as the requisite force is motive or suspensive; join PQ and draw the line Rm in the given direction meeting PQ in m; then Rm is the force required.

COROLLARY I. If the friction be the n part of the pressure, and W be the weight, s and c the sine and cosine of the plane's elevation, then the moving force parallel to the plane will be W $(s+c:n,)$ and the suspending force W $(s-c:n.)$

COROLLARY 2. If the direction of the force be parallel to the horizon, and t be the tangent of the plane's elevation, then W $(tn+1):(n-t)$ will be the moving force, and W $(tn-1):(n+t)$ the suspending force, and Wt the force excluding friction.

EXAMPLE. If the weight be a ton, the friction ⅓ of the pressure; AB = 5, BC = 3, and AC = 4, then the moving force will be 3235 pounds; the suspending force 747 pounds, and the force, excluding friction, 1680 pounds; nearly.

PROBLEM II.

Given the weight of the body, the inclination of the plane, and the ratio of the friction to the pressure; to find the direction so that the sustaining force may be a given quantity, or the least possible.

Draw DQ and QP as before, and let PR be to Rm as the weight to the given force; then from the center R with a distance equal to Rm, intersect PQ in m; then Rm is the required direction when the force is given; but to have it the least possible, draw Rm at right angles to PQ, then Rm is the direction required.

COROLLARY 1. An expression for the sustaining force, when the least possible, may be found as follows: In the triangles PDQ, RQm, the angle Q is common, therefore PQ : PD :: RQ : Rm; but PD is a fourth proportional to AB, AC, and PR, and DQ is to PD as 1 to n, supposing this the given ratio; also RD is a fourth proportional to AB, BC, and PR, consequently RQ is equal to DQ either added to, or substracted from, DR, as it is the first, or second case; and because PQ : PD :: $\sqrt{(nn+1)}:n$ :: RQ : Rm, therefore Rm = PR (n. BC $\pm$ AC) : AB$\sqrt{(nn+1)}$ or $(ns \pm c)$ W : $\sqrt{(nn+1)}$, by substituting s and c for the natural sine and cosine of the plane's elevation, and using the negative or affirmative sign as the force required, is the moving or suspending one respectively.

EXAMPLE. If AB = 5, BC = 3, and AC = 4, and the weight

1 ton, then the least moving and sustaining forces will be 1825 and 702 pounds respectively.

COROLLARY 2. Because the triangles PDQ and RQm are similar, and the ratio of PD to DQ constant to each fixed value of n, therefore the angle QRm being equal to DPQ, will also be constant, whether the inclination of the plane be variable or not; and hence the angles of the direction with the plane for the draught to be made with the greatest advantage, are found for different values of n as follows:

n	QRm	n	QRm	n	QRm	n	QRm	n	QRm	n	QRm
	° ′		° ′		° ′		° ′		° ′		° ′
1	45.0	2	26.34	3	18.26	4	14. 2	5	11.19	6	9.28
1¼	38.40	2¼	23.58	3¼	16.54	4¼	13.15	5¼	10.47	7	8. 8
1½	33.41	2½	21.48	3½	15.57	4½	12.32	5½	10.18	8	7. 8
1¾	29.45	2¾	19.59	3¾	14.56	4¾	11.53	5¾	9.52	9	6.20

N. B. The direction, or angle QRm, is to be taken below the plane for the suspending, and above the plane for the moving, force.

SCHOLIUM. Though at first sight the former part of the above problem, which shews the best method of applying an active force, seems superior to the other, yet, on farther consideration, the other appears of equal consequence, and particularly in building and fastening walls, banks of earth and fortifications, &c. and the application of what are called *land-ties*, &c. Thus if a weight, for instance, is to be drawn along the plane RB, and the friction be ⅓ of the pressure, the best direction is when Rm makes an angle of 18° 26′ *above* the plane; but if the weight is a quantity of earth or stone, or any thing to be suspended, as in the case of land-ties, the best angle (on the foregoing supposition) must be 18° 26′ *below* the plane.

SCHOLIUM.

In those propositions the friction is estimated according to the most generally received opinion, that the resistance is proportional to the whole pressure compounded of the weight of the body, and the additional force necessary to overcome the friction ; but it has been asserted, that there may be cases where the friction is not proportional to the whole pressure, but to that which would arise if the body was sustained in a given direction, exclusive of friction ; and that there might also be cases, where the resistance arising from tenacity or cohesion might be as the relative pressure against the plane, and the force to overcome it the same in every direction ; something similar to a globe stuck fast in wet tenacious clay ; I shall therefore give solutions to both cases.

In the first case*, the force requisite to sustain the body in direction RV, exclusive of friction, is Rn ; and as Rn is equivalent to RD and Dn, therefore Pn is the pressure exclusive of friction : and as the friction is the n part of the pressure, the force acting parallel to AB to overcome it, is the n part of Pn ; but the force which acting in direction Rn will be equivalent to the n part of Pn in the direction Rn, is a fourth proportional to n times RD, Pn, and Rn ; but because DQ is the n part of DP, therefore fn is the n part of Pn, and the fourth proportional aforesaid will be nz ; consequently the sum or difference of Rn and nz must be a given quantity or the least possible : the problem therefore is reduced† to drawing a line Rn from the given point R, meeting the two lines PD and PQ given in position in n and z, so that nz added to or taken from Rn, the sum or difference may be a given quantity, or the least possible. To do this, let DS be taken equal to DR, and draw Sr parallel to PD meeting PQ in M ; then because Rn is equal to rn, the sum or difference of the quantities aforesaid is rz ; and when rz is required to be a given quantity, the question is reduced to that particular case of the inclinations of APPOLLONIUS, in solids, which has been resolved by NEWTON and BARROW ; the limits of the Problem, or the mode of drawing the line Rr, so that the intercepted part rz may be the least possible, may be investigated as follows :

‡ Suppose it done, and Rrz the position required, and let Rnm be indefinitely near to Rz, and Mh perpendicular to Rz ; then by applying the analysis of the ancients to the *Newtonian* doctrine of

* Fig. 3. † Fig. 4. ‡ Fig. 6.

prime and ultimate ratios, mn is equal to zr ; and if from the centre R, with the distances Rz and Rn, the arcs zv and nt be supposed to be described, vn is equal to zt, and consequently tr equal to mv ; but rt : tn :: rh : Mh, and tn : zv :: Rr : Rz, and zv : vm :: Mh : hz, whence by compounding the proportions, tr : vm :: Rr. rh : Rz. zh, and as the two first terms are equal, the two last are equal, and consequently Rr : Rz :: zh : rh, and dividing Rr : rz :: zh : rz, therefore Rr is equal to zh, and consequently the point h is in an hyperbola, whose asymptotes are QM and SM produced : but because the angle MhR is a right angle, the point h is also in the circumference of a circle ; therefore a line drawn from R to h, the point where the hyperbola and circle intersect, is the position required.

In the other case, where the resistance arising from tenacity or cohesion is supposed to be as the relative pressure against the plane, and the force to overcome it the same in each direction, we have Rn for the sustaining force, exclusive of friction ; and the n part of Pn for the friction ; and consequently the sum or difference of these is the expression for the whole force ; and the Problem may be thus constructed. Take PD to DQ as the pressure to the friction, and join PQ ; on PD describe a circle, in which take Dv equal to DQ ; join PV, and draw RV perpendicular to it : then RV will represent the direction and measure of the whole force when it is the least possible.

For DQ and Dv are equal, and consequently nf is equal to Vn ; but DQ is the n part of DP, therefore nf or Vn is the n part of Pn, and consequently RV is equal to the sum or difference of Rn, and the n part of Pn ; but RV is the least possible by construction, and therefore the other is a minimum also. For draw any other line Rk meeting RV in k and PD in m ; and draw mq, mt, parallel to DQ and Dv ; then the sum or difference of Rm and mt is equal to the sum or difference of Rm and mq ; but the sum of difference of Rm and mt is greater than RV, and therefore the sum or difference of Rn and the n part of Pn is the least possible.

PROBLEM III.

Given the weight of the body, the inclination of the plane, and the force sustaining the body in a given direction ; to find the ratio of the friction to the pressure.

Take PR as before, (see Fig. 1. 2.) draw Rm in the given direction, and take PR to Rm as the weight of the body to the force sustaining it; draw Pm meeting AB in Q, and PD perpendicular to AB; then PD is to DQ as the pressure to the friction.

PROBLEM IV.

If AhqN be the segment of an equilateral triangle, which, by moving parallel to itself and the horizon, generates a solid, upon which a figure hmGEHKpqh moves, touching the former in hm and qp; required the effect of the friction; still supposing it the n part of the pressure.

Let P be the centre of gravity of half the body*, and PR its weight as before; then the body by means of its inflexibility is kept together in the same manner as if it was actuated by a force parallel to the horizon; but if PDn be perpendicular to Ah, and Rn parallel to the horizontal line AC, meeting PD in n, Pn will be the pressure against the side Ah, and the friction is the n part of Pn; but PR : Pn :: AC : AB; therefore if AC represent the weight of half the body, the n part of AB will express the weight requisite to overcome the friction for that half; and by doubling the expressions they serve for the whole. Wherefore let W represent the weight of the body, s the secant of the angle BAC; then *Ws* will be the pressure against the plane AD; and the n part of Ws the force necessary to overcome the friction; and as this last is the force necessary to draw the body along a horizontal plane, therefore the force necessary to draw the body along a horizontal plane is to that necessary to draw it along the body whose section is AhqN, as AC to AB or as 1 to *s*.

Because when the angle CAB is given, the ratio of PR to Pn is constant; therefore when the solid whose section is AhqN is elevated, making an angle with the horizon, so that its base forms an inclined plane; PR in that case represents the pressure in a normal direction to that plane, and Pn the pressure against the solid; and as the friction is increased in the ratio of the pressure, therefore if the pressure which the body would have on the inclined plane be increased in the ratio of AC to AB, or radius to the secant of the angle CAB, then the pressure on the angular plane or body, whose perpendicular section is AhqN, will be had, and consequently its n part, or the friction. Hence this construction*; let PR represent the weight; then PD at right angles to AB represents the pressure that the body would exert against the common inclined plane; take DK to DP as AB in the foregoing figure to AC, or as the secant of the inclination of the angular plane with its base to radius; let Dq be the n part of DK, and join Kq; then RM drawn any how to meet Kq in M, gives RM for the measure of the whole force in that direction; and it is the moving or suspending force according as Dq is taken upwards or downwards in the line AB.

* Fig. 7.

It is evident that Kq is parallel to PQ, and therefore though the least force (which is perpendicular to Kq) differ from that in the former cases, yet the directions for having the greatest effect are still the same as in the foregoing table: the demonstration is in effect the same as the first.

Corollary. By supposing *s* to be the secant of the angle †, that the sides of the angular plane make with the base, proceeding as Corollary 2d of Problem 1st, and putting *t* for the natural tangent of the plane's inclination, and W for PR the weight, we have W $(tn+s)$: $(n-t)$ for the moving; and W $(tn-s)$: $(n+t)$ for the suspending force, necessary to draw the body along the angular inclined plane by a force acting parallel to the base of the plane.

Example. Let AB, BC, and AC, be 5, 3, and 4 respectively, and let the inclination of the sides be 45°; the weight of a ton and the friction one third of the pressure; then 3648 pounds is the moving, and 499 the suspending force.

SCHOLIUM.

In this proposition, those parts of the plane on which the body moves, are supposed rectilineal, as mostly happens in practice; but the friction is easily estimated in curvilinear surfaces, and may be found generally as follows:

* Fig. 5. † Fig. 8.

Let AMP* be half the section perpendicular to the horizon, and to the axis of the solid which forms the curvilineal plane on which the body is moved; AP the axis; PM the ordinate, and MS a tangent to the curve at the point M; also let RM represent the weight or pressure in a direction perpendicular to the horizon at the point M; and let RF be perpendicular to MS meeting MP in F; also let PN be taken equal to MR, and PQ equal to RF; and suppose the same construction to be made for every point of the curve, and let HN be the locus of all the points N, and GQ the locus of all the points Q; then will the friction, when drawn along the horizontal plane, be to the friction of the same body when drawn along the curvilinear plane in the same direction, as the area APNH to the area APQG.

For the friction on the horizontal plane being as the sum of the pressures, is as the sum of all the elementary lines MR or PN; that is, as the area AHNP; and the friction on the curvilinear plane is for the same reason as the sum of all the RF or PQ, namely, as the area APQG; hence the truth of the proposition is manifest.

COROLLARY 1. Because Mn or the fluxion of y is to Mm the fluxion of the curve, as MR or PN to RF or PQ, therefore if PM be a function of AP, PQ will be a fourth proportional to the fluxion of the ordinate, the fluxion of the curve AM, and this function; wherefore if the curves HN and AM be given; the nature of the curve GQ will be known, and its area may be found by the common methods of quadratures.

COROLLARY 2. It is evident that when the planes are inclined to the horizon, the frictions of the right and curvilinear planes are still in the same ratio as in the preceding cases, and consequently may be found by the same mode of proceeding.

COROLLARY 3. It is also evident, that the above method holds good whether the parts of the body are connected together or not, with respect to their motion in the direction RM, so long as each elementary part MR may be considered as sustained at the point M by a force parallel to MP; but when the body is rigid or

* Fig. 9.

inflexible, the case becomes more simple, for MR is then constant, and APNH becomes a parallelogram.

COROLLARY 4. By supposing given properties to exist in any two of the curves AM, HN, or GQ, the nature of the third will be known; and hence a number of problems relative to friction may be proposed and resolved by a proper application of the direct and inverse methods of fluxions.

PROPOSITION 5. THEOREM.

In the application of forces to overcome friction, the same allowances must be made for the forces acting to advantage or disadvantage, by means of levers or other mechanical powers, as are made in the common doctrine; for instance, if a weight of two pounds, by acting, at the distance of one foot from the fulcrum of a lever, be sufficient to overcome the friction, then one pound at two feet distance will have the same effect, &c.

This is too evident to need a demonstration.

OF FRICTION IN THE SCREW.

As any force acting perpendicular to the direction of a moving body does not affect the motion of the body in that direction, so the force acting perpendicular to the axis of the screw has no effect on the motion of a body raised thereby exclusive of friction; it therefore requires the same force to raise a body by means of a screw, as to raise the same body in equal time along an inclined plane of the same elevation, as the threads of the screw by means of a force acting parallel to the base of the inclined plane: now, if we suppose the weight so contracted or condensed as to be capable of being placed on one of the threads of the screw, and fastened to an imaginary lever always perpendicular to its axis, then it is evident, this lever will have no effect but to change the direction of the weight, and keep it in the midst of the thread of the screw; and if a force be applied at the weight always perpendicular to this lever, so as to sustain or draw it along, this force will be determined exactly the same as was done before in the inclined plane: but the rigidity of the parts of the "female screw" serves exactly the same purpose as this imaginary lever, and makes the weight act upon the threads like a body sustained on an inclined plane by a force parallel to its base; and as the force to overcome both the weight and the friction is reciprocally as the distance from the centre of the axis, therefore the distance of the power from the centre of the axis, is to the distance from the same centre to the middle of the threads of the screw, as the force necessary to sustain the body on the inclined plane, to the same force in the screw at the distance of the power. The same proposition holds good whether the threads be cut perpendicular to the axis or in an angle; for in the first, the common plane is to be taken; and in the second, the inclined or angular one considered in the fourth proposition: Wherefore if d be the distance from the centre of the axis to the middle of the threads of the screw; D the distance of the same centre to the point where the force is applied, the force to overcome the weight and friction is Wd $(tn \pm s) : (n \mp t)$ D, where the letters express the same things as before, and the upper sign is for the moving, and the lower for the suspending force. N.B. t is the natural tangent of the angle made by a line touching one of the threads, and a plane at right angles to the axis of the screw; or it is equal to the distance of the respective edges of two threads, divided by the circumference of the cylinder, out of which the screw is cut.

COROLLARY 1. When lines drawn from the centre of the axis of the screw to coincide with the threads, are at right angles to the axis, the above expression becomes $Wd\,(tn \pm 1) : (n \mp t)$ D, for s becomes radius or unity.

COROLLARY 2. When n is equal to t, the moving force will be infinite; also the suspending force will be nothing when t is the n part of s; and when $Wd\,(tn - s) : (n + t)\ D$, becomes negative, it expresses the quantity of force, which must act in a contrary direction to reduce the body just to a state of suspension.

SCHOLIUM.

It would be needless to make any allowance for the curvilinear surfaces of the threads of screws, as they seldom differ much from the two foregoing forms; neither is it of much consequence to allow for their parts being at different distances from the axis, as their breadth seldom bears any considerable ratio to the length of the levers by which they act; but the case is different when large bodies revolve on each other, and therefore it will be necessary to shew the mode of proceeding in such cases.

*Let MmAQ be a convex solid, generated by the revolution of the curve MAQ, about its axis perpendicular to the horizon; and MRSQ a concave body exactly fitting it; then if this last body be revolved about the axis AP by means of the lever Pf, the force necessary to overcome the friction of one body turning upon the other may be found as follows: suppose the revolving body divided into an infinite number of concentric tubes, that may descend independent of each other, and press freely against the body on which they revolve, and yet be so connected that the lever Pf, may give the same angular velocity at the same time to each; also let the ordinates PN of the curve HN represent the weight or pressure (in a direction perpendicular to the horizon) of each of the indefinitely small parts Mk, or elementary lines of the body at the distance PM from the axis, and let c be the circumference of a circle whose radius is unity: then because the friction of each of the elementary tubes MRSQ is as its pressure, and the pressure is as the number of lines Mk, and the pressure of each; therefore as this number is as PM.Mn.c, we have the n part of this expression for the force which, acting at M, would overcome the friction of the cylindrical tube, if moved round upon a horizontal plane; but as the pressure of each elementary part is increased in the ratio of Mn to Mm, when moved on the solid MAQ, the real force will be (PM.c.Mm.PN) : n; also Pf : PM :: (PM.c.Mm.PN) : n to the small elementary force which will overcome the last force when acting at f; consequently the whole force will be equal to the fluent of PM^2 PN.Mm.c) : (n.Pf).

COROLLARY. By means of the curves AM, HN, &c. conclusions may be drawn similar to those in the Corollaries to the Scholium of the fourth proposition.

OF FRICTION IN THE LEVER.

It has been already observed, that a force acting perpendicular to the direction of a body, in motion, does not alter the body's motion in that direction; therefore if† we suppose DB to be an

* Fig. 10. † Fig. 11.

upright cylinder, and AB a body touching it in a line as in the figure, and retained close to it by an imaginary force, drawing it perpendicular towards the axis; then if a force CP be applied to C, the centre of gravity of AB, and be always supposed to act perpendicularly to the radius CN, drawn from the centre of the axis to the point C, the friction will be the same in drawing the body round the cylinder, as in drawing it along a horizontal plane with an equal pressure; and if it be moved round by a force acting at a greater distance, the force will be reciprocally as the distance: on the contrary, if the body AB be fixed, and the cylinder turned round about its axis, the friction will be the same as if the cylinder was fixed, and the body drawn round it by CP, as before: Likewise the friction is the same, whether the cylinder be fixed, and the body AB moved round the axis MR by a force Qc applied at c, or whether the point c be fixed with AB fastened to Cc, and the cylinder be revolved in a circle, whose centre is c, so as always to retain its parallelism with respect to any fixt object; and as this last case obtains in the axletrees of carriages, since every point of the wheel's contact with the ground may be considered as the centre of motion for that instant, therefore the effect of the resistance arising from the friction of the concave part of the nave upon the axletree, is to the effect that would arise from drawing the same weight over a horizontal plane of the same kind as the parts that rub each other, as the radius of the axis to the radius of the wheel. It must be observed, that this is not the only friction to which carriages are subject, for there is another part, arising from the cohesion of the wheel and the ground at their contact, which is to be found and allowed for by the three first Propositions.

In the above, the pressure and friction have been supposed to be as the weight, as it is on a horizontal plane; but by the Scholium to the fourth Proposition, it is plain that the pressure is greater than the weight, and may be so in any proportion; however, as it appears by calculation, that the pressure on an arc of ninety degrees is to that on its chord, only as 1,183 to 1, when both the concave and convex parts have exactly the same curvature, the difference will be so trifling, when the cylinders have different curvatures as usual, as to require very seldom to be allowed for.

This being premised, let M* be a weight placed at the point A of a lever, moveable about an axis whose centre is d and radius dn; and let N be the sustaining force acting at B: now it is evident that the pressure on the axis d differs so little from the weight, that it may be safely taken for it without any considerable error, except in some remarkable cases, which may be allowed for from what has been said already; and therefore the friction which ought in strictness to be taken as the n part of the pressure, will here be taken as the n part of the weight upon the axis. Now if N be taken for the force which, acting at B, would be just sufficient to keep the weight M at A in equilibrio, exclusive of friction, and if W be the additional force to be added to N so as to overcome the friction, then will M+P, M−P, and P−M, be the weight upon the axis at d in the first, second, and third figures respectively, (supposing the sum of M and N to be equal to P;) now as the friction is the n part of each of these quantities, and its effect is to keep the lever in a state of rest, therefore in whatever direction the force at N endeavours to draw the lever by acting at B, the friction tends to counteract that force by keeping the lever steady, or acting in a contrary direction at n; and as the effect of the friction, and the additional force W, are in equilibrio, and the friction acts by means of the lever dn, and the force W by the lever dB; therefore Bd is to dn as the sum or difference of the n part of $N+W$ and M is to W; consequently $W=dn\,(M+N):(n.Bd-dn,)$ in the first figure; $W=dn\,(M-N):(n.Bd+dn)$, in the second figure; and in the third figure, $W=dn\,(N-M):(n.Bd-dn)$: all these are the expressions for the moving forces.

To find the suspending forces, or the forces which acting at N, shall be just sufficient to prevent the weight M from descending: let M and N be the same as before, and let w be the force which, taken from N, will leave a force just sufficient to prevent M from descedning; then the weight upon d in the first figure will be $M+N-w$; in the second figure, the weight will be $M-N+w$; and in the third figure, $N-M-w$; and by proceeding as before, the values of w in the suspending forces are $dn\,(M-N):(n.Bd.+dn)$; $dn\,(M-N):(n.Bd-dn)$, and $dn\,(N-M):(n.Bd+dn,)$ in the first, second, and third figures, respectively.

* Fig. 12, 13, 14.

Because Bd : dA :: M : N, therefore if this value of N be substituted in each of the above expressions for the friction, the whole force capable of sustaining the friction and weight M will be had: thus for example, the moving force to overcome the friction and weight M in the first figure, will be *M(n.dA + dn) : (n.Bd—dn,)* and the suspending force *M(n.dA—dn) : (n.Bd+dn ;)* in the second figure, the moving force will be *M(n.dA + dn) : (n.Bd + dn,)* and the suspending force *M(n.dA—dn): (n.Bd—dn ;)* and in the third figure, the moving force will be *M(n.dA—dn)*: (*n.Bd—dn,)* and the suspending force will be *M(n.dA + dn) : (n.Bd + dn.)*

The method of finding *n* from each of the above equations is evident, and consequently the ratio of the friction to the pressure by experiments.

OF FRICTION IN THE WEDGE.

Let AC* be the force necessary to sustain the wedge QPB in the direction aB perpendicular to QP, friction included; and let AB be the force exclusive of friction: draw AN and AH perpendicular to the BQ and BP ; CG parallel to AN, and CF parallel to AH : Now GA and AF, the forces of the wood against the sides of the wedge, in those directions, compound a force equivalent to the diagonal CA in the direction CA, and therefore a force represented by AC in that direction, must be applied to the head of the wedge at *a* to overcome these forces: Let gr be the n part of Ag, and let the lines Ar be drawn, and also GK and FZ perpendicular to AG and AF meeting the lines Ar in K and Z; then will GK and FZ represent the friction against the sides BP and BQ, being each the n part of AG and AF, the pressure against each side, respectively; wherefore if Be be taken in PB, and Bn in BQ equal to GK and FZ respectively, the forces Be and Bn in those directions must compound a force to which the force BC in the direction BC must be equivalent; and consequently if Bm be the force compounded of Be and Bn, and Cm be joined, Cm must be perpendicular to mB; since Be or GK is the force of friction arising from the pressure against BP, which tends to prevent the wedge from moving either in the direction BP or PB; and Bn or FZ has a similar effect with respect to the direction in the line BQ; and by hypothesis BC is just sufficient to balance these forces. It is also evident from what was said concerning the inclined plane, that Be and Bn must be taken in the directions PB and QB for the moving force, but in the directions BP and BQ for the suspending force.

* Fig. 15.

The method of calculation is evident; for as aB, AG, and AF, are perpendicular to QP, BP, and BQ, the triangles QPB and CAG are similar, and the parallelogram Bnme similar to FAGC; whence by supposing certain parts given, the rest may be found, &c.

COROLLARY. When the wedge is isosceles the point m falls on C, and Be is equal to Bn, and therefore Be or GK is equal to (AB + BC)PB) :(n.QP) ; but PB:Ba:: 2Be: BC, and therefore BC = 2Ba (AB + BC):(n.QP) or equal to (2Ba.BA) : (n. QP—2Ba,) and therefore AC = (n.QP.AB) : (n.QP—2Ba ;) and by following the same method for the suspending force, we find BC = (2Ba.AB):(n.QP + 2Ba,) and consequently AC is equal to (n.QP.AB): (n.QP + 2Ba.)

SCHOLIUM.

By proceeding in a similar method, the forces of the arch-stones of bridges, &c. may be determined; for let QbbP be a stone sustained by the parts of the arch pressing against Pb and Qb, and let A be its centre of gravity, and AB perpendicular to the horizon; also let AB and AC be the same as before; then because the body is in equilibrio, the force in direction AC will be equivalent to the force in a contrary direction, arising from the pressures against the body in the directions GA and KA, together with the force of friction; and because the pressures are AG and AK, if Be (the n part of AG) be drawn parallel to PB, and Bn (the n part of AK) be drawn parallel to Qb; and the parallelogram Bnme be compleated, and Cm joined; Bm will be the force arising from friction, and the angle BmC a right angle. The adjacent figure* is for the moving force; but the method is similar for the suspensive force; and it is evident that the one construction is of use to determine the force which tends to break an arch by pressing it downwards, and the other the force that tends to break it upwards

But as that excellent mathematician P. FRISI, in his *Instituzioni di Meccanica*, has objected to the division of the force AB

* Fig. 16.

in the forces AN and AH, and thence concluded BELIDOR and COUPLET to have been mistaken on that account in their writings upon bridges; I shall, therefore, prove that the common method is really a consequence of what that gentleman himself allows, and that his objections are not well founded. In the first place he allows the force AB to be equivalent to the forces AV and AD or VB; now (excluding friction) if that part of the arch which touches Pb was removed, it is evident QbbP would immediately begin to descend along Qb with a force represented by VB or AD; but this descent is prevented by that part of the arch which touches Pb, and therefore the force of that arch, in the direction HA, must be such as to be equivalent to DA in the direction DA or BV; but no force greater or less than HA will be equivalent to DA in the direction DA, and therefore HA is the real pressure or force against Pb. Again, HD is the pressure in a perpendicular direction to Qb arising from this force; and as AV is the pressure against Qb arising from the force AB, therefore AV, together with HD, is the whole pressure against Qb in the direction AV; but because the body is in equilibrio, and consequently the action or force in the direction AV equal to the reaction in a contrary direction; therefore AV + HD or AN (because NV is equal to HD by the property of the parallelogram) represents the pressure against Qb, and AH the pressure against Pb; which is contrary to what P. FRISI asserts, and agreeable to the usual method.

The same learned author has made another very material mistake, from a similar cause, at page 67 of the aforesaid Treatise, relative to the tension of ropes; which cannot be attributed to haste or inadvertency, as he expressly asserts the holders of the common opinion to be mistaken, in consequence of their using the theory of composition of forces without sufficient precaution: I shall, therefore, after giving his own words, take the liberty of shewing where I apprehend he is mistaken.

"Parleremo più a lungo delle altre recerche matematiche, alle quali ha dato occasione la controversia insorta intorno alla cupola di S. Pietro. Coll' occasione che si è discorso in Milano di munire la fabbricca del Duomo di un Conduttore elettrico, che dalla cima

dell' aguglia si dirimasse, e scendesse per differenti parti del tempio, si è ancora parlato dell azione, che i fili del Conduttore potrebbero esercitare contra l'aguglia, e si sono proposti varj Problemi intorno alle tensioni delle funi. Io qui aggiugneró le soluzioni, che ho ritrovato, e incommincieró dalla prima risoluzione delle forze tendenti, la quale siccome é interamente differente da quella, que hanno seguitato altri Autori, cosi non sará meraviglia che porti dei risultati interamente differenti da quelli che sono stati sinora publicati. Penda il* filo QVR, dai punti Q,edR, e vi si attacchi in V il peso P. si produca la verticale PV in A; si esprima il peso P colla retta AV, e dal punto A; si tirino sopra QV, RV le perpendicolari AM, AN. Sara MV l'intera forza esercitata secondo QV, ed NV sará quella che si eserciterá secondo RV.

"La stessa cosa si dedurrebbe risolvendo la forza AV nelle due Aq, Ar parallele ai fili QV, RV, e poi risolvendo di nuovo la forza Aq nelle due AN, Nq, e similmente la Ar in due altre AM, Mr. Mentre conqueste risoluzioni é manifesto che la forza totale esercitata nel tendere il filo QV dev'essere Aq—Mr=rV—Mr=MV, e la tensione del filo RV=Vq—Nq=NV.

"S'ingannerebbe chi misurasse separatamente la tensione del filo QV dalla forza Aq, ossia rV, e la tensione di RV da Ar, oppure da qV. Egli è vero, che le due tensioni equivalgono insieme, comme alla sola forza AV, così ancora alle due Ar, Aq, oppure alle quattro insieme AN, Nq, AM, Mr. ma nel prendere le tensioni separate bisogna in oltre avvertire, che quando l' angolo QVR non è retto, una porzione di Aq agisce secondo RV, ed una porzione di Ar secondo QV: e separando le azioni sara MV, la tensione del filo QV, ed NV quella di RV."

In the first place, I shall demonstrate the truth of the established method from principles that FRISI has himself allowed; and, secondly, point out the absurdity of his conclusions.

1. Let Vn and Sr be parallel to AN; then because NVn is a right angle, and the force VA may be resolved into VN and Vn, in those directions, therefore if RV and VP were to remain in the same position, and the force which now keeps the body suspended by acting in the direction VQ, was to act in the direction Vn with a force expressed by Vn; it is then granted that the

* Fig. 17.

equilibrium would still be maintained, and the tensions would be as Vn and VN; and therefore, as no force VS whatever, acting at V in the direction RV, can have any effect in the direction Vn perpendicular to RV, it necessarily follows, that the force in any other direction VQ must be such as to be equivalent to Vn in the direction Vn; but it is likewise granted, that no other force but Vr in the direction VQ can be equivalent to Vn in the direction Vn; and as the force Vr is equivalent to Vn and VS; and as VS, or its equal qN, only gives an additional tension to NV, the tension which the cord RV was supposed to have before, which whole tension is equal to the reaction of the tack R; therefore qV is the tension of the cord RV, and Vr that of Qv.

2. Let the points Q and R coincide, and RV, QV, and VP, will then be perpendicular to the horizon; and if VQ or VR be assumed to express the weight P, then will the points A,R,Q,M, and N coincide; and according to FRISI'S principle, the tensions of RV, VQ, and VP, will be equal; but, from the well known principle of the pulley, each cord VQ and VR bears but half the weight P, and therefore this absurdity follows, that a cord is as much stretched with half the weight as it would with the whole.

Again, if the points R, V, and Q, be supposed horizontal, it follows, from the common theory, that the tension of the rope RVQ would be infinite; but VN and VM vanish when RVQ is horizontal, and therefore, by FRISI'S principle, the tension in that case would be nothing at all; but it is well known from the most common experiments to be very considerable, even when RQV is but nearly horizontal; and therefore the new theory of this great mathematician is indefensible.

REMARK. All the foregoing, except the last Scholium, was written in 1775, before the author had seen any thing to speak of on the subject; he had designed and executed great part of an extensive treatise on friction according to different hypotheses; but as no body would be at the risk of publishing it, and he could not afford it himself, the most of it was accidentally lost. What is here given is an extract only of some of the first part, where velocity was not taken into the account, and where there were no complicated algebraic or fluxional expressions, which would be difficult to print in this country.

TO THE HONOURABLE

SIR WILLIAM JONES,

PRESIDENT OF THE ASIATIC SOCIETY.

SIR,

I HAVE the honour to obey the orders of the Honourable the Governor General and Council, in transmitting to you, for the information of the *Asiatic Society*, an Extract of a Letter addressed to the Governor General, on the 2d of last month, by Lieutenant SAMUEL TURNER, who was appointed on an embassy to *Tibet*, and a Copy of an Account inclosed in it, of Mr. TURNER'S interview with TEESHOO LAMA, at the Monastery of *Terpaling*.

I have the Honour to be, with great respect,

SIR,

Your most obedient and most humble Servant,

E. Hay, *Secretary*.

COUNCIL CHAMBER,
Political Department, April 13, 1784.

EXTRACT OF A *LETTER* FROM MR. *SAMUEL TURNER*

TO THE HONOURABLE THE GOVERNOR GENERAL,

DATED PATNA, 2d MARCH, 1784.

DURING my residence in *Tibet*, it was an object I had much at heart, to obtain an interview of the infant TEESHOO LAMA; but the Emperor of *China's* general orders, restricting his guardians to keep him in the strictest privacy, and prohibiting indiscriminately the admission of all persons to his presence, even his votaries, who should come from a distance, appeared to me an obstacle almost insurmountable; yet, however, the Rajah, mindful of the amity subsisting between the Governor and him, and unwilling, I believe, by any act to hazard its interruption, at lengh consented to grant me that indulgence. As the meeting was attended with very singular and striking circumstances, I could not help noting them with most particular attention; and though the repetition of such facts, interwoven and blended as they are with superstition, may expose me to the imputation of extravagance and exaggeration, yet I should think myself reprehensible to suppress them; and while I divest myself of all prejudice, and assume the part of a faithful narrator, I hope, however tedious the detail I propose to enter into may be found, it will be received with candour, and merit the attention of those for whose perusal and information it is intended, were it only to mark a strong feature in the national character of implicit homage to the great religious sovereign, and to instance the very uncommon, I may say almost unheard of, effects of early tuition.

I shall, perhaps, be still more justified in making this relation, by adverting to that very extraordinary assurance the Rajah of *Teeshoo Loomboo* made me but a few days before my departure from his court, which, without further introduction, I will beg leave literally to recite.

At an interview he allowed me, after having given me my audience of leave, he said, "I had yesterday a vision of our tutelary "deity, and to me it was a day replete with much interesting and

"important matter. This guardian power, who inspires us with his "illuminations on every momentous and great occasion, indulged "me with a divination, from which I have collected that every thing "will be well; set your heart at rest, for though a separation is "about to take place between us, yet our friendship will not cease "to exist: but, through the favour of interposing Providence, "you may rest assured it will increase, and terminate eventually "in that which will be for the best."

I should have paid less regard to so strange an observation, but for this reason, that, however dissonant from other doctrines their positions may be found, yet I judge they are the best foundation to build our reliances upon, and superstition combining with inclination to implant such friendly sentiments in their minds, will ever constitute, the opinion having once obtained, the strongest barrier to their preservation. Opposed to the prejudices of a people, no plan can reasonably be expected to take place: agreeing with them, success must be the result.

E. HAY, *Secretary to the Governor General and Council.*
A true Extract.

VII.

COPY of an Account given by Mr. TURNER,

OF HIS

INTERVIEW WITH TEESHOO LAMA

At the Monastery of Terpaling, enclosed in Mr. TURNER's Letter to the Honourable the Governor General, dated Patna, 2d March, 1784.

ON the 3d of December, 1783, I arrived at *Terpaling*, situated on the summit of a high hill; and it was about noon when I entered the gates of the Monastery, which was not long since erected for the reception and education of TEESHOO LAMA. He resides in a palace in the centre of the Monastery, which occupies about a mile of ground in circumference, and the whole is encompassed by a wall. The several buildings serve for the accommodation of three hundred *Gylongs*, appointed to perform religious service with TEESHOO LAMA, until he shall be removed to the Monastery and Musnud of *Teeshoo Loomboo*. It is unusual to make visits either here or in *Bootan* on the day of arrival: we therefore rested this day, only receiving and sending messages of compliment.

On the 4th, in the morning, I was allowed to visit TESHOO LAMA, and found him placed in great form upon his Musnud; on the left side stood his father and mother, on the other the officer particularly appointed to wait upon his person. The Musnud is a fabric of silk cushions piled one upon the other, until the seat is elevated to the height of four feet from the floor; an embroidered silk covered the top, and the sides were decorated with pieces of silk of various colours, suspended from the upper edge, and hanging down. By the particular request of TEESHOO LAMA'S father, Mr. SAUNDERS and myself wore the *English* dress.

I advanced, and, as is the custom, presented a white pelong handkerchief; and delivered also into the LAMA'S hands the Governor's present of a string of pearls and coral, while the other things were set down before him. Having performed the ceremony of the exchange of handkerchiefs with his father and mother, we took our seats on the right of TEESHOO LAMA.

A multitude of persons, all those ordered to escort me, were admitted to his presence, and allowed to make their prostrations. The infant LAMA turned towards them, and received them all with a cheerful and significant look of complacency. His father then addressed me in the *Tibet* language, which was explained to me by the interpreter, that TEESHOO LAMA had been used to remain at rest until this time of the day; but he had awoke very early this morning, and could not be prevailed upon to remain longer in bed; for, added he, "the *English* Gentlemen "were arrived, and he could not sleep." During the time we were in the room, I observed the LAMA'S eyes were scarce ever turned from us, and when our cups were empty of tea, he appeared uneasy, and throwing back his head, and contracting the skin of his brow, he kept making a noise, for he could not speak, until they were filled again. He took out of a golden cup, containing confects, some burnt sugar, and stretching out his arm, made a motion to his attendants to give them to me. He then sent some in like manner to Mr. SAUNDERS, who was with me. I found myself, though visiting an infant, under the necessity of saying something; for it was hinted to me, that, notwithstanding he is unable to reply, it is not to be inferred that he cannot understand. However, his incapacity of answering excused me many words; and I just briefly said. That the Governor General, on receiving the news of his decease in *China*, was overwhelmed with grief and sorrow, and continued to lament his absence from the world, until the cloud that had overcast the happiness of this nation, by his re-appearance, was dispelled; and then, if possible, a greater degree of joy had taken place than he had experienced of grief on receiving the first mournful news. The Governor wished he might long continue to illumine the world with his presence; and was hopeful that the friendship which had formerly subsisted between them would not be diminished, but rather that it might become still greater than before; and that, by his continuing to shew kindness to my countrymen, there might be an extensive communication between his votaries and the dependants of the *British* nation. The little creature turned, looking steadfastly towards me with the appearance of much attention while I spoke, and nodded with repeated, but slow movements of the head, as though he understood and approved every word, but could not utter a reply. The parents, who stood by all the time, eyed their son with a look of affection, and a smile expressive of heartfelt joy at the propriety of the young LAMA'S conduct. His whole regard was turned to us; he was silent and sedate, never once looking towards his parents, as if under their influence at the time; and with whatever pains his manners may have been formed so correct, yet I must own his behaviour on this occasion appeared perfectly natural and spontaneous, and not directed by any action or sign of authority.

The scene in which I was here brought to take a part was too new and extraordinary, however trivial, if not absurd, as it may appear to some, not to claim from me great attention, and consequently minute remark.

TEESHOO LAMA is at this time about 18 months of age. He did not speak a word, but made most expressive signs, and conducted himself with astonishing dignity and decorum. His complexion is of that hue which in *England* we should term rather brown, but not without colour. His features good, small black eyes, an animated expression of countenance; and altogether I thought him one of the handsomest children I had ever seen. I had but little conversation with the father. He told me he had directions to entertain me three days on account of TEESHOO LAMA; and entreated me with so much earnestness to pass another on his own account, that I could not resist complying with his request. He then invited us for to-morrow to an entertainment he proposed to make at a small distance from the Monastery, which invitation having accepted, we took our leave and retired.

In the course of the afternoon I was visited by two officers of the LAMA'S household, both of whom are immediately attendant on his person. They sat and conversed with me some time, enquired after MR. BOGLE, whom both of them had seen; and then remarking how extremely fortunate it was the young LAMA'S having regarded us with very particular notice, observed on the very strong partiality of the former TEESHOO LAMA for the *English*, and that the present one often tried to utter the name of the *English*. I encouraged the thought, hopeful that they would teach the prejudice to strengthen with his increasing age; and they assured me

that should he, when he begins to speak, have forgot, they would early teach him to repeat the name of HASTINGS.

On the morning of the 6th, I again waited on TEESHOO LAMA, to present some curiosities I had brought for him from *Bengal*. He was very much struck with a small clock, and had it held to him, watching for a long time the revolutions of the moment hand; he admired it, but with gravity, and without any childish emotion. There was nothing in the ceremony different from the first day's visit. The father and mother were present. I staid about half an hour, and retired, to return and take leave in the afternoon.

The votaries of TEESHOO LAMA already begin to flock in numbers to pay their adorations to him. Few are yet admitted to his presence. Those who come, esteem it a happiness if he is but shewn to them from the window, and they are able to make their prostrations before he is removed. There came to day a party of *Kilmaaks (Calmuc Tartars)* for purposes of devotion, and to make their offerings to the LAMA. When I returned from visiting him, I saw them standing at the entrance of the square in front of the palace, each with his cap off, his hands being placed together elevated, and held even with his face. They remained upwards of half an hour in this attitude, their eyes fixed upon the apartment of the LAMA, and anxiety very visibly dipicted in their countenances. At length, I imagine, he appeared to them; for they began altogether by lifting their hands, still closed, above their heads, then bringing them even with their faces, and after lowering them to their breasts, then separating them: to assist them in sinking and rising, they dropt upon their knees, and struck their heads against the ground. This with the same motions was repeated nine times. They afterwards advanced to deliver their presents, consisting of talents of gold and silver, with the products of their country, to the proper officer, who having received them, they retired apparently with much satisfaction.

Upon enquiry, I learnt that offerings made in this manner are by no means unfrequent, and in reality constitute one of the most copious sources from which the LAMAS of *Tibet* derive their wealth.

No one thinks himself degraded by performing these humiliations. The persons I allude to, who came for this devout purpose, were attendant on a man of superior rank, that seemed to be more engrossed than the rest in the performance of the ceremony. He wore a rich satin garment, lined with fox skins; and a cap with a tossel of scarlet silk flowing from the centre of the crown upon the sides all round, and edged with a broad band of *Siberian* fur.

According to appointment, I went in the afternoon to make my last visit to TEESHOO LAMA. I received his dispatches for the Governor General, and from his parents two pieces of satin for the Governor, with many complements.

They presented me with a vest, lined with lambskins, making many assurances of a long remembrance, and observing that at this time TEESHOO LAMA is an infant, and incapable of conversing, but they hoped to see me again when he shall have become of age. I replied, that, by favour of the LAMA, I might again visit this country: I looked forward with anxiety to the time when he should mount the Musnud, and should then be extremely happy in the opportunity of paying my respects. After some expressions and protestations of mutual regard, my visit was concluded: I received the handkerchiefs, and took my leave: and am to pursue my journey towards *Bengal* to-morrow at the dawn of day.

(Signed) SAMUEL TURNER.

A true Copy,

E. HAY, *Secretary to the Governor General and Council.*

To Sir WILLIAM JONES, Knight,

PRESIDENT OF THE ASIATIC SOCIETY.

SIR,

THE Honourable the Governor General having received and laid before the Board a Letter addressed to him by Lieutenant SAMUEL TURNER, containing the Account of a Journey made to *Teshoo Loomboo* by a *Gosseyn*, named POORUNGEER, and the circumstances of his reception by TEESHOO LAMA; and the Board deeming it worthy of the Attention of the *Asiatic Society*, I have the Honour, in Obedience to their Directions, to transmit to you a Copy of it.

I have the Honour to be,

SIR,

Your most obedient humble Servant,

E. HAY, *Secretary.*

FORT WILLIAM,
Secret Department, Feb. 22, 1786.

VIII.

AN ACCOUNT OF A JOURNEY TO TIBET.

TO THE HONOURABLE

JOHN MACPHERSON, ESQ.

GOVERNOR GENERAL, &c. &c. &c.

FORT WILLIAM.

HONOURABLE SIR,

HAVING, in obedience to the instructions with which you were pleased to honour me, examined POORUNGEER, the *Gosseyn*, who has at different times been employed in deputations to the late TEESHOO LAMA, formerly accompanied him to the court of *Pekin*, and who is lately again returned from *Tibet*, and having collected from him such an account of the journey he has just performed, and other information, as he could give me relative to the countries he has left, I beg leave to submit it to you in the following narrative.

In the beginning of last year POORUNGEER, having received dispatches from Mr. HASTINGS, a short time previous to his departure from *Bengal*, for TEESHOO LAMA and the Regent of *Teeshoo Loomboo*, immediately set about preparing for the distant journey he had engaged to undertake, which employed him until the beginning of the following month of March, when I beg leave to recal to your remembrance I had the honour to present him to you for his dismission. He then commenced his journey from *Calcutta*, and early in the month of April had passed, as he relates, the limits of the Company's Provinces, and entered the mountains that constitute the kingdom of *Bootan*, where, in the prosecution of his journey, he received from the subjects of the DAIB RAJA the most ample and voluntary assistance to the frontier of his territory; nor met with any impediment to oppose his progress until he came upon the borders of *Tibet*. Here he was compelled to halt for near a fortnight by a heavy fall of snow, that commenced upon his arrival, and continued incessantly for the space of six days, covering the face of the country to so great a depth, as totally to put a stop to all travelling, and render it impracticable for him to pro-

ceed until a thaw succeeded to open the communication. During the time of his confinement at *Phari*, he says, such was the severity of the cold, and the injurious effect so rapid a transition from a temperate climate had on the health of himself and his companions, that it left him little room to doubt, if an early change had not fortunately taken place, and permitted his advance, that they must all have fallen victims to the inclemency of the weather.

However, as early as it was possible for him to leave *Phari*, he proceeded by long stages on his journey, and, without encountering any further difficulty, on the 8th of May following, reached *Teeshoo Loomboo*, the capital of *Tibet*. Immediately upon entering the Monastery, he went to the Durbar of the Regent PUNJUR INTINNEE NEMOHEIN to announce his arrival, and the purpose of his commission. Quarters were then allotted for his residence, and an hour fixed for him to wait upon TEESHOO LAMA; who, he was informed the following morning, intended to leave the palace to occupy one of his gardens, situated on the plain within sight of the monastery, where it was visible a considerable encampment had been formed. The LAMA quitted his apartment at the first dawn of day, and was lodged in the tents pitched for his accommodation before the sun had risen.

In the course of the morning, at the hour appointed for his admission, POORUNGEER went down to the LAMA'S tents. He heard, on entering the gates of the enclosure, that the youug LAMA was taking his recreation in the garden, ranging about, which became with him a very favourite amusement. As it was at this time in *Tibet* the warmest part of the year, that he might enjoy the benefit of the air, his attendants had chosen a spot where the trees afforded a complete shade, to place an elevated seat of cushions for the young LAMA, after his exercise, to rest upon. In this situation POORUNGEER found him, when summoned to his presence, attended by the Regent, his Parents, SOOPOON CHOOMBOO, the cup bearer, and the principal officers of the court. After making three obeisances at as remote a distance as it was possible, POORUNGEER approached, and presented to the LAMA, according to the custom of *Tibet*, a piece of white pelong, and then delivered the letters and presents with which he had been charged. The packages were all immediately opened before the LAMA, who had every article brought near to him, and viewed them separately one by one. The letter he took into his own hand, himself broke the seal, and taking from under the cover a string of pearls, which it enclosed, ran them over between his fingers, as they read their rosaries, and then with an arch air placed them by his side, nor would, while the narrator was in his presence, permit any one to take them up. POORUNGEER says the young LAMA regarded him with a very kind and significant look, spoke to him in the *Tibet* language, and asked him if he had had a fatiguing journey. The interview lasted more than an hour, during all which time the LAMA sat with the utmost composure, not once attempting to quit his seat, nor discovering the least forward uneasiness at his confinement. Tea was twice brought in, and the LAMA drank a cup each time. When ordered to accept his dismission, POORUNGEER approached the LAMA, and bowing before him, presented his head uncovered to receive his blessing, which the young LAMA gave, by stretching out his hand, and laying it upon his head. He then ordered him, for as long as he resided at *Teeshoo Loomboo*, to come to him once every day.

The following morning POORUNGEER waited upon the regent at his apartments in the palace, to whom, after observing the customary forms of introduction, he delivered his dispatches. After this he visited SOOPOON CHOOMBOO, the LAMA'S parents, and others, to whom he was before known, and says he experienced from all quarters the most cordial and kind reception; for they had been long used to consider him as an agent of the government of *Bengal*. He found no change whatever to have ensued in the administration since his attendance upon me in *Tibet*. The country enjoyed perfect tranquillity; and the only event that had taken place of importance in their annals, was the inauguration of the infant LAMA, which happened the preceding year; and as this constitutes a concern of the highest moment, whether considered in a political or religious point of view, being no less than the recognizance in an infant form of their re-generated Immortal Sovereign and Ecclesiastical Supreme, I was induced to bestow more than common pains to trace the ceremonies that attended the celebration of such a great event, conceiving that the novelty of the subject might render the account curious, if even it should be found to contain no information of real utility. I shall therefore, without further apology, subjoin the result of my enquiries, premising only that my authority for the description is derived principally from POORUNGEER, and confirmed with some additional particulars, by the concurring reports of a *Gosseyen* who was at the time himself present on the spot.

The Emperor of *China* appears, on this occasion, to have assumed a very conspicuous part, in giving testimony of his respect and zeal for the great religious Father of his Faith. Early in the year 1784 he dispatched ambassadors from the court of *Pekin* to *Teeshoo Loomboo*, to represent their sovereign in supporting the dignity of the High Priest, and do honour to the occasion of the assumption of his office. DALAI LAMA and the Viceroy of *Lassa*, accompanied by all the court, one of the *Chinese* generals stationed at *Lassa* with a part of the troops under his command, two of the four magistrates of the city, the heads of every monastery throughout *Tibet*, and the emperor's ambassadors, appeared at *Teeshoo Loomboo* to celebrate this epocha in their theological institutions. The 28th day of the seventh moon, corresponding nearly, as their year commences with the vernal equinox, to the middle of October 1784, was chosen as the most auspicious for the ceremony of inauguration; a few days previous to which the LAMA was conducted from *Terpaling*, the monastery in which he had passed his infancy, with every mark of pomp and homage that could be paid by an enthusiastic people. So great a concourse, as assembled either from curiosity or devotion, was never seen before; for not a person of any condition in *Tibet* was absent who could join the suite. The procession was hence necessarily constrained to move so slow, that though *Terpaling* is situated at the distance of twenty miles only from *Teeshoo Loomboo*, three days expired in the performance of this short march. The first halt was made at *Tsondue;* the second at *Summaar;* about six miles off whence the most splendid parade was reserved for the LAMA'S entry on the third day; the account of which is given me by a person who was present in the procession. The road, he says, was previously prepared by being whitened with a wash, and having piles of stones heaped up, with small intervals between, on either side. The retinue passed between a double row of priests, who formed a street extending all the way from *Summaar* to the gates of the palace. Some of the priests held lighted rods of a perfumed composition, that burn like decayed wood, and emit an aromatic smoke; the rest were furnished with the different musical instruments they use at their devotions, such as the gong, the cymbal, the hautboy, trumpets, drums, and sea shells, which were all sounded in union with the hymn they chanted. The croud of spectators were kept without the street, and none admitted on the high road but such as properly belonged to, or had a prescribed place in, the procession, which was arranged in the following order.

The van was led by three military commandants, or governors of districts, at the head of 6 or 7000 horsemen, armed with quivers, bows, and matchlocks. In their rear followed the ambassador, with his suite, carrying his diploma, as is the custom of *China*, made up in the form of a large tube, and fastened on his back. Next the *Chinese* general advanced with the troops under his command, mounted and accoutred after their way with fire arms and sabres; then came a very numerous group, bearing the various standards and insignia of state. Next to them moved a full band of wind and other sonorous instruments; after which were led two horses, richly caparisoned, each carrying two large circular stoves, disposed like panniers, across the horse's back, and filled with burning aromatic woods. These were followed by a senior priest, called a *Lama*, who bore a box, containing books of their form of prayer and some favourite idols. Next nine sumptuary horses were led, loaded with the LAMA'S apparel; after which came the priests immediately attached to the LAMA'S person for the performance of daily offices in the temple, amounting to about 700: following them were two men, each carrying on his shoulder a large cylindrical gold insignium, embossed with emblematical figures, (a gift from the Emperor of *China*.) The *Duhunniers* and *Soopoons*, who were employed in communicating addresses, and distributing alms, immediately preceded the LAMA'S bier, which was covered with a gaudy canopy, and borne by eight of the sixteen *Chinese* appointed for this service. On one side of the bier attended the Regent, on the other the LAMA'S Father. It was followed by the heads of the different monasteries; and as the procession advanced, the priests who formed the street fell in the rear, and brought up the suite, which moved at an extremely slow pace, and about noon was received within the confines of the monastery, amidst an amazing display of colours, the acclamations of the croud, solemn music, and the chanting of their priests.

The LAMA being safely lodged in the palace, the Regent and SOOPOON CHOOMBOO went out, as is a customary compliment paid to visitors of high rank on their near approach, to meet and conduct DALAI LAMA and the Viceroy of *Lassa*, who were on the way to *Teeshoo Loomboo*. Their retinues encountered the following morning at the foot of *Painom* castle, and the next day together entered the monastery of *Teeshoo Loomboo*, in which both DALAI LAMA and the Viceroy were accommodated during their stay.

The following morning, which was the third after TEESHOO LAMA'S arrival, he was carried to the great temple, and about noon seated upon the throne of his progenitors; at which time the Emperor's ambassador delivered his diploma, and placed the presents with which he had been charged at the LAMA'S feet.

The three next ensuing days DALAI LAMA met TEESHOO LAMA in the temple, where they were assisted by all the priests in the invocation and public worship of their Gods. The rites then performed completed, as I understand, the business of inauguration. During this interval all who were at the capital were entertained at the public expence, and alms were distributed without reserve. In conformity likewise to previous notice circulated every where for the same space of time, universal rejoicings prevailed throughout *Tibet*. Banners were unfurled on all their fortresses, the peasantry filled up the day with music and festivity, and the night was celebrated by general illuminations. A long period was afterwards employed in making presents and public entertainments to the newly inducted LAMA, who, at the time of his accession to the Musnud, or (if I may use the term) pontificate, of *Teeshoo Loomboo*, was not three years of age. The ceremony was begun by DALAI LAMA, whose offerings are said to have amounted to a greater value, and his public entertainments to have been more splendid, than the rest. The second day was dedicated to the Viceroy of *Lassa*. The third to the *Chinese* General. Then followed the Culloong, or Magistrates of *Lassa*, and the rest of the principal persons who had accompanied DALAI LAMA. After which the Regent of *Teeshoo Loomboo*, and all that were dependent on that government, were severally admitted, according to pre-eminence of rank, to pay their tributes of obeisance and respect. As soon as the acknowledgements of all those were received who were admissible to the privilege, TEESHOO LAMA made, in the same order, suitable returns to each, and the consummation lasted forty days.

Many importunities were used with DALAI LAMA to prolong his stay at *Teeshoo Loomboo*, but he excused himself from encumbering the capital any longer with so numerous a concourse of people as attended on his movements, and deeming it expedient to make his absence as short as possible from the seat of his authority, at the expiration of forty days he withdrew with all his suite to *Lassa*, and the Emperor's ambassador received his dismission to return to *China;* and thus terminated this famous festival.

With respect to the lately-established commercial intercourse, POORUNGEER informs me, that though so early, he found himself not the first person who had arrived at *Teeshoo Loomboo* from *Bengal*. Many merchants had already brought their commodities to market, and others followed before he left it. He heard from no quarter any complaint of impediment or loss, and concludes, therefore, that all adventurers met the same easy access and ready aid as he himself had every where experienced. The markets were well-stocked with *English* and *Indian* articles, yet not in so great a degree as to lower the value of commodities below the prices of the two or three last preceding years. Bullion was somewhat reduced in worth in comparison with the year 1783. A pootree, or bulse of gold dust, the same quantity that then sold for twenty-one indermillees, was procurable of a purer quality for nineteen and twenty indermillees. A talent of silver, which was then 500, was 450 indermillees; so that the exchange was much in favour of the trader.

POORUNGEER, during his residence at *Teeshoo Loomboo*, had very frequent interviews with the Regent and the Ministers, and assures me, he found the heartiest dispositions in them to encourage the commercial intercourse established under the auspices of the late Governor General, whose departure, however, the Regent regretted, as the loss of the first friend and ally he became connected with, of, I believe it may be said, any foreign nation; in whom was acknowledged also the original means of opening the communication, and of commencing a correspondence, between the Governments of *Bengal* and *Tibet;* and although it may be observed that, in consequence of his having from the beginning, been used exclusively to address himself to, and acknowledge alone the agents of,

Mr. HASTINGS, his attachments to the *English* nation had grown not without a great degree of personality; yet, free from an unworthy capriciousness of temper, he descended not to take advantage of the opening offered by his friend's departure to close the new connection. For such was the respect he had learnt to entertain for our national integrity of character, that, under the apparent conviction our views tended to no scheme of ambition, but were confined merely to objects of utility and curiosity, POORUNGEER assures me, he expressed an anxious desire for continuing with the succeeding Governor General the exercise of those offices of friendship so long supported by his predecessor; and in the hope that his would be met with equal wishes, determined to invite you to join him in preserving the same intercourse of commerce and correspondence, so essentially calculated for the benefit of both countries. In consequence of which the LAMA and the Regent addressed the letters POORUNGEER had the honour to deliver to you, translations of which having, in obedience to your directions, been applied for to your *Persian* translator, I now subjoin them.

Copy of a Letter from TEESHOO LAMA.

"God be praised that the situation of these countries is in "peace and happiness, and I am always praying at the altar of the "Almighty for your health and preservation. this is not unknown: "you are certainly employed in protecting and assisting the whole "world, and you promote the good and happiness of mankind. "We have made no deviation from the union and unanimity which "existed during the time of the first of nobles Mr. HASTINGS "and the deceased LAMA; and may you also grant friendship to "these countries, and always make me happy with the news of your "health, which will be the cause of ease to my heart, and confirma- "tion to my soul. At this time, as friendly offerings of union and "unanimity, I send one handkerchief, one ketoo of silver, and one "piece of cochin. Let them be accepted."

From the RAJAH *of* Teeshoo Loomboo.

"God be praised that the situation of these countries is in "peace and happiness, and I am always praying at the altar of "the Almighty for your health and preservation. This is not un- "known: I am constantly employed in promoting the advantage of "the subjects and the service of the newly seated LAMA, because the "newly seated LAMA is not distinct from the deceased LAMA, and "the light of his countenance is exalted. Grant your friendship to "POORUNGEER *Gosseyn*.

"Maintain union, and unanimity, and affection, like the first of "nobles, and every day make me happy with the news of your "health and prosperity; and bestow favours like the first of nobles, "and make me happy with letters, which are causes of consolation. "At this time, as friendly offerings of union, and affection, and "unanimity, I send one handkerchief, three tolah of gold, and one "piece of cochin. Let them be accepted."

POORUNGEER, having received these dispatches in the beginning of October, after a residence of five months at *Teeshoo Loomboo*, took leave of the LAMA and the regent, and set out on his return, by the same route, he came to *Bengal*. The weather at this season of the year being most extremely favourable for travelling, he experienced no delay or interruption in the course of his journey through *Tibet* and *Bootan*, but arrived at *Rungpore* early in December, whence he proceeded as expeditiously as possible to the Presidency; where, to his great mortification and concern, he finds, upon his arrival, his affairs involved in great distress; the little territory his adopted Chela was left in charge of, having, during his absence, been violently invaded by RAAJ CHUND, a neighbouring Zemeendar, and to the amount of fifty begas forcibly taken out of his hands. Prevailed on by his earnest repeated solicitations, I am induced to say for him, that in your justice and favour are his only hopes of relief from his embarrassments; and he humbly supplicates your protection in restoring and securing him in the possession of his invaded right. The liberty of this intercession, I am confident to think, would be forgiven, were it not in favour of one who has rendered to this Government various useful services; but as, though of trivial importance, it affords an authentic instance of the encroaching disposition of inferior Zemeendars. Yet another circumstance it may not be improper to point out. The ground alluded to is a part of the land situated upon the western bank of the river opposite Calcutta, that was formerly granted under a Sunnud of this Government to TEESHOO LAMA, for the foundation of a temple of worship, and as a resort for such pilgrims of their nation, as might occasionally make visits to the consecrated Ganges.

Having, in conformity to your desires, done my best endeavours literally to translate all the information POORUNGEER could give me, I have now only to apologize for the prolixity of the account, which I have been induced to be particularly minute in, as I conceived every circumstance, however trivial, might be in some degree interesting, that tends to illustrate any trait in the national character of a people we are but recently become acquainted with, and with whom in its extended views it has been an object of this Government to obtain a closer alliance.

I will not now presume to intrude longer on your time, by adding any observations on conjectures deducible from the elevated importance your young ally seems rising to, in consequence of the signal respect paid him by the most exalted political characters known to his nation; but beg leave to repeat, that it is with infinite satisfaction I learn from the reports of POORUNGEER the flourishing state of the lately projected scheme of trade, to promote which, he assures me, not any thing had been wanting in facility of intercourse: that the adventurers, who had invested their property, had experienced perfect security in conducting their commerce, carried their articles to an exceeding good market, and found the rate of exchange materially in their favour.

Those advantages authorize the inference, that it will no doubt encourage more extensive enterprize; and permit me to add, I derive a confidence from the success of this infant essay, that inspires me with the strongest hopes, that the commission which your Honourable Board was pleased to commit to my charge, will eventually be productive of essential benefits to the political and commercial interests of the Company.

I have the honour to be,

HONOURABLE SIR,

With the greatest respect,

Your most obedient, faithful,

And most humble Servant,

SAMUEL TURNER.

Calcutta, February 8, 1786.

IX.

On the GODS of GREECE, ITALY, and INDIA.

WRITTEN IN 1784, AND SINCE REVISED,
BY THE PRESIDENT.

We cannot justly conclude, by arguments preceding the proof of facts, that one idolatrous people must have borrowed their deities, rites, and tenets from another; since Gods of all shapes and dimensions may be framed by the boundless powers of imagination, or by the frauds and follies of men, in countries never connected; but, when features of resemblance, too strong to have been accidental, are observable in different systems of polytheism, without fancy or prejudice to colour them and improve the likeness, we can scarce help believing, that some connection has immemorially subsisted between the several nations, who have adopted them: it is my design, in this Essay, to point out such a resemblance between the popular worship of the old *Greeks* and *Italians*, and that of the *Hindus;* nor can there be room to doubt of a great similarity between their strange religions and that of *Egypt*, *China*, *Persia*, *Phrygia*, *Phœnice*, *Syria;* to which perhaps, we may safely add some of the southern kingdoms, and even islands, of *America:* while the *Gothick* system, which prevailed in the northern regions of *Europe*, was not merely similar to those of *Greece* and *Italy*, but almost the same in another dress, with an embroidery of images apparently *Asiatic*. From all this, if it be satisfactorily proved, we may infer a general union or affinity between the most distinguished inhabitants of the primitive world, at the time when they deviated, as they did too early deviate, from the rational adoration of the only true GOD.

There seem to have been four principal sources of all mythology. I. Historical or natural truth has been perverted into fable by ignorance, imagination, flattery, or stupidity; as a king of *Crete*, whose tomb had been discovered in that island, was conceived to have been the God of *Olympus;* and MINOS, a legislator of that country, to have been his son, and to hold a supreme appellate jurisdiction over departed souls; hence too probably flowed the tale of CADMUS, as BOCHART learnedly tarces it; hence beacons or volcanos became one-

eyed giants, and monsters vomiting flames; and two rocks, from their appearance to mariners in certain positions, were supposed to crush all vessels attempting to pass between them; of which idle fictions many other instances might be collected from the *Odyssey* and the various *Argonautick* poems. The less we say of *Julian* stars, deifications of princes or warriors, altars raised, with those of Apollo, to the basest of men, and divine titles bestowed on such wretches as CAJUS OCTAVIANUS, the less we shall expose the infamy of grave senators and fine poets, or the brutal folly of the low multitude: but we may be assured, that the mad apotheosis of truly great men, or of little men falsely called great, has been the origin of gross idolatrous errors in every part of the Pagan world. II. The next source of them appears to have been a wild admiration of the heavenly bodies, and, after a time, the systems and calculations of astronomers; hence came a considerable portion of *Egyptian* and *Grecian* fable; the *Sabian* worship in *Arabia;* the *Persian* types and emblems of *Mihr*, or the Sun; and the far extended adoration of the elements and the powers of nature; and hence, perhaps, all the artificial Chronology of the *Chinese* and *Indians*, with the invention of demi-gods and heroes to fill the vacant niches in their extravagant and imaginary periods. III. Numberless Divinities have been created solely by the magic of poetry, whose essential business it is to personify the most abstract nations, and to place a Nymph or a Genius in every grove, and almost in every flower; hence *Hygieia* and *Jaso*, health and remedy, are the poetical daughters of ÆSCULAPIUS, who was either a distin guished physician, or medical skill personified; and hence *Chloris*, or verdure, is married to the *Zephyr*. IV. The metaphors and allegories of moralists and metaphysicians have been also very fertile in Deities; of which a thousand examples might be adduced from PLATO, CICERO, and the inventive commentators on HOMER, in their pedigrees of the Gods, and their fabulous lessons of morality: the riches and noblest stream from this abundant fountain is the charming philosophical tale of PSYCHE, or the *Progress of the Soul;* than which, to my taste, a more beautiful, sublime, and well supported allegory was never produced by the wisdom and ingenuity of man. Hence also the *Iudian* MA'YA', or, as the word is explained by some *Hindu* scholars, "the first inclination of the Godhead to diversify "himself (such is their phrase) by creating worlds," is feigned to be the Mother of universal Nature, and of all the inferior Gods; as a *Cashmirian* informed me, when I asked him, why CA'MA, or *Love*, was represented as her son; but the word MA'YA', or *Delusion*, has a more subtile and recondite sense in the *Védánta* philosophy, where it signifies the system of *perceptions*, whether of secondary or of primary qualities, which the Deity was believed by EPICHARMUS, PLATO, and many truly pious men, to raise by his omnipresent spirit in the minds of his creatures; but which had not, in their opinion, any existence independent of mind.

In drawing a parallel between the Gods of the *Indian* and *European* Heathens, from whatever source they were derived, I shall remember, that nothing is less favourable to inquiries after truth than a systematical spirit, and shall call to mind the saying of a *Hindu* writer, "that whoever obstinately adheres to any set of "opinions, may bring himself to believe that the freshest sandal-"wood is a flame of fire:" this will effectually prevent me from insisting, that such a God of *India* was *the* JUPITER of *Greece*; such, *the* APOLLO; such, *the* MERCURY. In fact, since all the causes of polytheism contributed largely to the assemblage of *Grecian* Divinities, (though BACON reduces them all to refined allegories, and NEWTON to a poetical disguise of true history,) we find many JOVES, many APOLLOS, many MERCURIES, with distinct attributes and capacities: nor shall I presume to suggest more than that, in one capacity or another, there exists a striking similitude between the chief objects of worship in ancient *Greece* or *Italy* and in the very interesting country which we now inhabit.

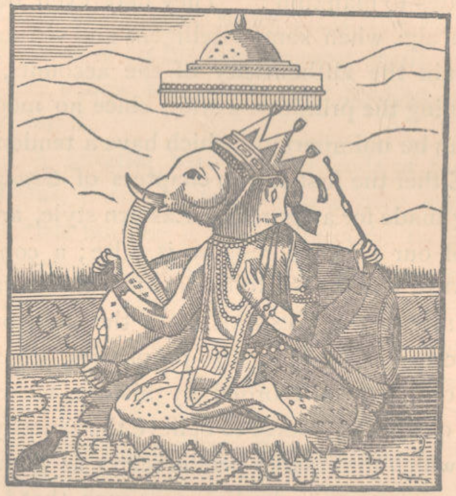
The comparison, which I proceed to lay before you, must needs be very superficial; partly from my short residence in *Hindustan*, and partly from my want of complete leisure for literary amusements; but principally because I have no *European* book, to refresh my memory of old fables, except the conceited, though not unlearned, work of POMEY, entitle the *Pantheon*, and that so miserably translated, that it can hardly be read with patience. A thousand more strokes of resemblance might, I am sure, be collected by any who should with that view peruse HESIOD, HYGINUS, CORNUTUS, and the other mythologists; or, which would be a shorter and a pleasanter way, should be satisfied with the very elegant *Syntagmata* of LILIUS GIRALDUS.

Disquisitions concerning the manners and conduct of our species in early times, or indeed at any time, are always curious at least and amusing; but they are highly interesting to such as can say of themselves with CHREMES in the play, "We are men, and take an interest "in all that relates to mankind:" They may even be of solid importance in an age, when some intelligent and virtuous persons are inclined to doubt the authenticity of the accounts, delivered by MOSES, concerning the primitive world; since no modes or sources of reasoning can be unimportant, which have a tendency to remove such doubts. Either the first eleven chapters of *Genesis*, all due allowances being made for a figurative Eastern style, are true, or the whole fabric of our national religion is false; a conclusion, which none of us, I trust, would wish to be drawn. I, who cannot help believing the divinity of the MESSIAH, from the undisputed antiquity and manifest completion of many prophesies, especially those of ISAIAH, in the only person recorded by history, to whom they are applicable, am obliged of course to believe the sanctity of the venerable books, to which that sacred person refers as genuine; but it is not the truth of our national religion, as such, that I have at heart: it is truth itself; and, if any cool unbiased reasoner will clearly convince me, that MOSES drew his narrative through *Egyptian* conduits from the primeval fountains of *Indian* literature, I shall esteem him as a friend for having weeded my mind from a capital error, and promise to stand among the foremost in assisting to circulate the truth, which he has ascertained. After such a declaration, I cannot but persuade myself, that no candid man will be displeased, if, in the course of my work, I make as free with any arguments, that he may have advanced, as I should really desire him to do with any of mine, that he may be disposed to controvert. Having no system of my own to maintain, I shall not pursue a very regular method, but shall take all the Gods, of whom I discourse, as they happen to present themselves; beginning, however, like the *Romans* and the *Hindus*, with JANUS or GANE'SA.

The titles and attributes of this old *Italian* deity are fully comprized in two choriambic verses of SULPITIUS; and a farther account of him from OVID would here be superfluous:

Jane pater, *Jane* tuens, dive biceps, biformis,
O cate rerum sator, O principium deorum!

"Father JANUS, all-beholding JANUS, thou divinity with two "heads, and with two forms; O sagacious planter of all things, and "leader of deities!"



श्रीगणेशायनमः GANESA.

He was the God, we see, of *Wisdom;* whence he is represented on coins with *two*, and on the *Hetruscan* image found at *Falisci*, with *four*, faces; emblems of prudence and circumspection: thus is GANE'SA, the God of *Wisdom* in *Hindustan*, painted with an *elephant's* head, the symbol of sagacious discernment, and attended by a favourite *rat*, which the *Indians* consider as a wise and provident animal. His next great character (the plentiful source of many superstitious usages) was that, from which he is emphatically styled *the father*, and which the second verse before-cited more fully expresses, *the origin and founder of all things:* whence this notion arose, unless from a tradition that he first built shrines, raised altars, and instituted sacrifices, it is not easy to conjecture; hence it came however, that his name was invoked before any other God; that, in the old sacred rites, corn and wine, and, in later times, incense also, were first offered to JANUS; that the *doors* or *entrances* to private houses were called *Januæ*, and any pervious passage or thorough-fare, in the plural number, *Jani*, or *with two beginnings;* that he was represented holding a

rod, as guardian of ways, and a key, as *opening*, not gates only, but *all important works and affairs* of mankind; that he was thought to preside over the morning, or *beginning of day;* that, although the *Roman* year began regularly with *March*, yet the eleventh month, named *Januarius*, was considered as *first* of the twelve, whence the whole year was supposed to be under his guidance, and opened with great solemnity by the consuls inaugurated in his fane, where his statue was decorated on that occasion with fresh laurel; and, for the same reason, a solemn denunciation of war, than which there can hardly be a more momentous national act, was made by the military consul's opening the gates of his temple with all the pomp of his magistracy. The twelve altars and twelve chapels of JANUS might either denote, according to the general opinion, that he leads and governs twelve months; or that, as he says of himself in OVID, all entrance and access must be made through him to the principal Gods, who were, to a proverb, of the same number. We may add, that JANUS was imagined to preside over infants at their birth, or the *beginning* of life.

The *Indian* divinity has precisely the same character: all sacrifices and religious ceremonies, all addresses even to superior Gods, all serious compositions in writing, and all worldly affairs of moment, are begun by pious *Hindus* with an invocation of GANE'SA; a word composed of *ísa*, the *governor* or *leader*, and *gan´a*, or *a company* of deities, *nine* of which companies are enumerated in the *Amarcósh.* Instances of opening business auspiciously by an ejaculation to the JANUS of *India* (if the lines of resemblance here traced will justify me in so calling him) might be multiplied with ease. Few books are begun without the words "*salutation to* GANE'S," and he is first invoked by the *Bráhmans*, who conduct the trial by ordeal, or perform the ceremony of the *hóma*, or sacrifice to fire: M. SONNERAT represents him as highly revered on the Coast of *Coromandel;* "where the *Indians*, he says, would not on any account build a house, without "having placed on the ground an image of this deity, which they "sprinkle with oil and adorn every day with flowers; they set up his "figure in all their temples, in the streets, in the high roads, and in "open plains at the foot of some tree; so that persons of all ranks "may invoke him, before they undertake any business, and travellers "worship him, before they proceed on their journey." To this I may add, from my own observation, that in the commodious and useful town, which now rises at *Dharmáranya* or *Gayà*, under the auspices of the active and benevolent THOMAS LAW, Esq. collector of *Rotas*, every new-built house, agreeably to an immemorial usage of the *Hindus*, has the name of GANE'SA, superscribed on its door; and, in the old town, his image is placed over the gates of the temples.

We come now to SATURN, the oldest of the pagan Gods, of whose office and actions much is recorded. The jargon of his being the son of Earth and of Heaven, who was the son of the Sky and the Day, is purely a confession of ignorance, who were his parents or who his predecessors; and there appears more sense in the tradition said to be mentioned by the inquisitive and well-informed PLATO, "that "both SATURN or *time*, and his consort CYBELE, or the *Earth*, to-"gether with their attendants, were the children of *Ocean* and THETIS, "or, in less poetical language, sprang from the waters of the great "deep." CERES, the goddess of harvests, was, it seems, their daughter; and VIRGIL describes "the mother and nurse of all as crowned "with turrets, in a car drawn by lions, and exulting in her hundred "grand-sons, all divine, all inhabiting splendid celestial mansions." As the God of time, or rather as *time* itself personified, SATURN was usually painted by the heathens holding a scythe in one hand, and, in the other, a snake with its tail in its mouth, the symbol of perpetual cycles and revolutions of ages: he was often represented in the act of devouring years, in the form of children, and, sometimes, encircled by the seasons appearing like boys and girls. By the *Latins* he was named SATURNUS; and the most ingenious etymology of that word is given by FESTUS the grammarian, who traces it, by learned analogy to many similar names, *à satu*, from planting, because, when he reigned in *Italy*, he introduced and improved agriculture: but his distinguishing character, which explains, indeed, all his other titles and functions, was expressed allegorically by the stern of a ship or galley on the reverse of his ancient coins; for which OVID assigns a very unsatisfatory reason, "because the divine stranger arrived in a "ship on the *Italian* coast;" as if he could have been expected on horse-back or hovering through the air.

The account, quoted by POMEY from ALEXANDER POLYHISTOR, casts a clearer light, if it really came from genuine antiquity, on the whole tale of SATURN; "that he predicted an extraordinary fall of rain, "and ordered the construction of a vessel, in which it was necessary "to secure men, beasts, birds, and reptiles from a general inundation."

Now it seems not easy to take a cool review of all these testimonies concerning the birth, kindred, offspring, character, occupations, and entire life of SATURN, without assenting to the opinion of BOCHART, or admitting it at least to be highly probable, that the fable was raised on the true history of NOAH; from whose flood a new period of *time* was computed, and a new series of ages may be said to have sprung; who rose fresh, and, as it were, newly born from the waves; whose wife was in fact the universal mother, and, that the earth might soon be repeopled, was early blessed with numerous and flourishing descendants: if we produce, therefore, an *Indian* king of divine birth, eminent for his piety and beneficence, whose story seems evidently to be that of NOAH disguised by *Asiatic* fiction, we may safely offer a conjecture, that he was also the same personage with SATURN. This was MENU, or SATYAVRATA, whose patronymic name was VAIVASWATA, or Child of the SUN; and whom the *Indians* not only believe to have reigned over the whole world in the earliest age of their chronology, but to have resided in the country of *Dravira*, on the coast of the Eastern *Indian* Peninsula: the following narrative of the principal event in his life I have literally translated from the *Bhágavat;* and it is the subject of the first *Purána*, entitled that of the *Matsya*, or *Fish*.

"Desiring the preservation of herds, and of *Bráhmans*, of genii "and virtuous men, of the *Védas*, of law, and of precious things, the "lord of the universe assumes many bodily shapes; but, though he "pervades, like the air, a variety of beings, yet he is himself unvaried, "since he has no quality subject to change. At the close of the last "*Calpa*, there was a general destruction occasioned by the sleep of "BRAHMA'; whence his creatures in different worlds were drowned "in a vast ocean. BRAHMA', being inclined to slumber, desiring re-"pose after a lapse of ages, the strong demon HAYAGRI'VA came near "him, and stole the *Védas*, which had flowed from his lips. When "HERI, the preserver of the universe, discovered this deed of the "Prince of *Dánavas*, he took the shape of a minute fish, called *sap'harì*. "A holy king, named SATYAVRATA, then reigned; a servant of the "spirit, which moved on the waves, and so devout, that water was his "only sustenance. He was the child of the Sun, and, in the present "*Calpa*, is invested by NARA'YAN in the office of *Menu*, by the name "of SRA'DDHADE'VA, or the God of Obsequies. One day, as he was "making a libation in the river *Critamálà*, and held water in the palm "of his hand, he perceived a small fish moving in it. The king of "*Dravira* immediately dropped the fish into the river together with "the water, which he had taken from it; when the *sap'harì* thus pathe- "tically addressed the benevolent monarch: How canst thou, O king, "who showest affection to the oppressed, leave me in this river-water, "where I am too weak to resist the monsters of the stream, who fill me "with dread?" He, not knowing who had assumed the form of a fish, "applied his mind to the preservation of the *sap'harì*, both from good "nature and from regard to his own soul; and, having heard its "very suppliant address, he kindly placed it under his protection in "a small vase full of water; but, in a single night, its bulk was so in- "creased, that it could not be contained in the jar, and thus again "addressed the illustrious Prince: "I am not pleased with living "miserably in this little vase; make me a large mansion, where I may "dwell in comfort." The king, removing it thence, placed it in the "water of a cistern; but it grew three cubits in less than fifty minutes, "and said: "O king, it pleases me not to stay vainly in this narrow "cistern: since thou hast granted me an asylum, give me a spacious "habitation." He then removed it, and placed it in a pool, where, "having ample space around its body, it became a fish of consider- "able size. "This abode, O king, is not convenient for me, who must "swim at large in the waters: exert thyself for my safety; and re- "move me to a deep lake:" Thus addressed, the pious monarch threw "the suppliant into a lake, and, when it grew of equal bulk with that "piece of water, he cast the vast fish into the sea. When the fish was "thrown into the waves, he thus again spoke to SATYAVRATA: "here "the horned sharks, and other monsters of great strength will devour "me; thou shouldst not, O valiant man, leave me in this ocean." "Thus repeatedly deluded by the fish, who had addressed him with "gentle words, the king said: "who art thou, that beguilest me in "that assumed shape? Never before have I seen or heard of so pro- "digious an inhabitant of the waters, who, like thee, has filled up, in "a single day, a lake an hundred leagues in circumference. Surely, "thou art BHAGAVAT, who appearest before me; the great HERI, "whose dwelling was on the waves; and who now, in compassion to "thy servants, bearest the form of the natives of the deep. Saluta-

"tion and praise to thee, O first male, the lord of creation, of preser- "vation, of destruction! "Thou art the highest object, O supreme "ruler, of us thy adorers, who piously seek thee. All thy delusive "descents in this world give existence to various beings: yet I am "anxious to know, for what cause that shape has been assumed by "thee. Let me not, O lotos-eyed, approach in vain the feet of a deity, "whose perfect benevolence has been extended to all; when thou "hast shown us, to our amazement, the appearance of other bodies, "not in reality existing, but successively exhibited." The lord of "the universe, loving the pious man, who thus implored him, and in- "tending to preserve him from the sea of destruction, caused by the "depravity of the age, thus told him how he was to act. "In seven "days from the present time, O thou tamer of enemies, the three "worlds will be plunged in an ocean of death; but, in the midst of the "destroying waves, a large vessel, sent by me for thy use, shall stand "before thee. "Then shalt thou take all medicinal herbs, all the va- "riety of seeds; and, accompanied by seven Saints, encircled by "pairs of all brute animals, thou shalt enter the spacious ark and con- "tinue in it, secure from the flood on one immense ocean without "light, except the radiance of thy holy companions. When the ship "shall be agitated by an impetuous wind, thou shalt fasten it with a "large sea-serpent on my horn; for I will be near thee: drawing the "vessel, with thee and thy attendants, I will remain on the ocean, O "chief of men, until a night of BRAHMA' shall be completely ended. "Thou shalt then know my true greatness, rightly named the su- "preme Godhead; by my favour, all thy questions shall be answered, "and thy mind abundantly instructed." 'HERI, having thus directed 'the monarch, disappeared; and SATYAVRATA humbly waited for the 'time, which the ruler of our senses had appointed. The pious king, 'having scattered toward the east the pointed blades of the grass '*darbha*, and turning his face toward the north, sat meditating on the 'feet of the God, who had borne the form of a fish. The sea, over- 'whelming its shores, deluged the whole earth; and it was soon 'perceived to be augmented by showers from immense clouds. He, 'still meditating on the command of BHAGAVAT, saw the vessel ad- 'vancing, and entered it with the chiefs of *Bráhmans*, having carried 'into it the medicinal creepers, and conformed to the directions of 'HERI. The saints thus addressed him:' "O king, meditate on CE'-

"SAVA; who will surely deliver us from this danger, and grant us pros-
"perity." 'The God, being invoked by the monarch, appeared again 'distinctly on the vast ocean in the form of a fish, blazing like a gold, 'extending a million of leagues, with one stupendous horn; on which 'the king, as he had before been commanded by HERI, tied the ship 'with a cable made of a vast serpent, and happy in his preservation, 'stood praising the destroyer of MADHU. When the monarch had 'finished his hymn, the primeval male, BHAGAVAT, who watched for 'his safety on the great expanse of water, spoke aloud to his own di- 'vine essence, pronouncing a sacred *Purána*, which contained the 'rules of the *Sánc'hya* philosophy: but it was an infinite mystery to 'be concealed within the breast of SATYAVRATA; who, sitting in the 'vessel with the saints, heard the principle of the soul, the Eternal 'Being, proclaimed by the preserving porwer. Then HERI, rising to- 'gether with BRAHMA', from the destructive deluge, which was abat- 'ed, slew the demon HAYAGRI'VA, and recovered the sacred books. 'SATYAVRATA, instructed in all divine and human knowledge, was 'appointed in the present *Calpa*, by the favour of VISHNU, the se- 'venth MENU, surnamed VAIVASWATA: but the appearance of a 'horned fish to the religious monarch was *Máyá*, or delusion; and he 'who shall devoutly hear this important allegorical narrative, will be 'delivered from the bondage of sin.'

This epitome of the first *Indian* History, that is now extant, appears to me very curious and very important; for the story, though whimsically dressed up in the form of an allegory, seems to prove a primeval tradition in this country of the *universal deluge* described by MOSES, and fixes consequently the *time* when the genuine *Hindu* Chronology actually begins. We find, it is true, in the *Purán*, from which the narrative is extracted, *another deluge*, which happened towards the close of the *third* age, when YUDHISTH'IR was labouring under the persecution of his inveterate foe DURYO'DHAN, and when CRISHNA, who had recently become incarnate for the purpose of succouring the pious, and of destroying the wicked, was performing wonders in the country of *Mat'hurà*; but the second flood was merely *local*, and intended only to affect the people of *Vraja:* they, it seems had offended INDRA, the God of the firmament, by their enthusiastic adoration of the wonderful child, "who lifted up the moun- "tain *Góverdhena*, as if it had been a flower, and, by sheltering all the

"herdsmen and shepherdesses from the storm, convinced INDRA of "his supremacy." That the *Satya*, or (if we may venture so to call it) the *Saturnian*, age was, in truth, the age of the *general* flood, will appear from a close examination of the ten *Avatárs*, or *descents*, of the deity in his capacity of preserver; since of the four, which are declared to have happened in the *Satya yug*, the *three first* apparently relate to some stupendous convulsion of our globe from the fountains of the deep, and the fourth exhibits the miraculous punishment of pride and impiety: First, as we have shown, there was, in the opinion of the *Hindus*, an interposition of Providence to preserve a devout person and his family (for all the *Pandits* agree, that his wife, though not named, must be understood to have been saved with him) from an inundation, by which all the wicked were destroyed: next, the power of the deity descends in the form of a *Boar*, the symbol of strength, to draw up and support on his tusks the whole earth, which had been sunk beneath the ocean: thirdly, the same power is represented as a *tortoise* sustaining the globe, which had been convulsed by the violent assaults of demons, while the Gods churned the sea with the mountain *Mandar*, and forced it to disgorge the sacred things and animals, together with the water of life, which it had swallowed. These three stories relate, I think, to the same event, shadowed by a moral, a metaphysical, and an astronomical, allegory; and all three seem connected with the hieroglyphical sculptures of the old *Egyptians*. The fourth *Avatár* was a *lion* issuing from a bursting column of marble to devour a blaspheming monarch, who would otherwise have slain his religious son; and of the remaining six, not one has the least relation to a deluge. The three which are ascribed to the *Trétá-yug*, when tyranny and irreligion are said to have been introduced, were ordained for the overthrow of tyrants, or, their natural types, giants with a thousand arms, formed for the most extensive oppression: and, in the *Dwáparyug*, the incarnation of CRISHNA was partly for a similar purpose, and partly with a view to thin the world of unjust and impious men, who had multiplied in that age, and began to swarm on the approach of the *Caliyug*, or the age of *contention* and baseness. As to BUDDHA, he seems to have been a reformer of the doctrines contained in the *Védas;* and, though his good nature led him to censure those ancient books, because they enjoined sacrifices of cattle, yet he is admitted as the ninth *Avátar* even by the *Bráh-*

mans of *Cási*, and his praises are sung by the poet JAYADE'VA: his character is in many respects very extraordinary; but, as an account of it belongs rather to history than to mythology, it is reserved for another dissertation. The tenth *Avatár*, we are told, is yet to come, and is expected to appear mounted (like the crowned conqueror in the *Apocalyps*) on a white horse, with a cimeter blazing like a comet, to mow down all incorrigible and impenitent offenders who shall then be on earth.

These four *Yugs* have so apparent an affinity with the *Grecian* and *Roman* ages, that one origin may be naturally assigned to both systems: the first in both is distinguished as abounding in *gold*, though *Satya* mean *truth* and *probity*, which were found, if ever, in the times immediately following so tremendous an exertion of the divine power as the destruction of mankind by a general deluge; the next is characterized by *silver;* and the third, by *copper;* though their usual names allude to proportions imagined in each between vice and virtue: the present, or *earthen*, age, seems more properly discriminated than by *iron*, as in ancient *Europe;* since that metal is not baser or less useful, though more common, in our times, and consequently less precious, than copper; while mere *earth* conveys an idea of the lowest degradation. We may here observe, that the true History of the World seems obviously divisible into *four* ages or periods; which may be called, first, the *Diluvian*, or purest age; namely, the times preceding the deluge, and those succeeding it till the mad introduction of idolatry at *Babel;* next, the *Patriarchal*, or pure, age; in which, indeed, there were mighty hunters of beasts and of men, from the rise of patriarchs in the family of SEM, to the simultaneous establishment of great empires by the descendants of his brother HA'M; thirdly, the *Mosaic*, or less pure, age; from the legation of MOSES, and during the time when his ordinances were comparatively well-observed and uncorrupted; lastly, the *prophetical*, or *impure*, age, beginning with the vehement warnings given by the prophets to apostate kings and degenerate nations, but still subsisting, and to subsist, until all genuine prophecies shall be fully accomplished. The duration of the historical ages must needs be very unequal and disproportionate; while that of the *Indian Yugs* is disposed so regularly and artificially, that it cannot be admitted as natural or probable. Men do not become reprobate in a geometrical progression, or at the termination of regular periods; yet so well-proportioned are the *Yugs*, that even the length of human life is diminished, as they advance, from an hundred thousand years in a subdecuple ratio; and, as the number of principal *Avatárs* in each decreases arithmetically from four, so the number of years in each decreases geometrically, and altogether constitute the extravagant sum of four million three hundred and twenty thousand years, which aggregate, multiplied by seventy-one, is the period in which every MENU is believed to preside over the world. Such a period, one might conceive, would have satisfied ARCHYTAS, the *measurer of sea and earth, and the numberer of their sands*, or ARCHIMEDES, who invented a notation that was capable of expressing the number of them; but the comprehensive mind of an *Indian* chronologist has no limits; and the reigns of fourteen MENUS are only a single day of BRAHMA', fifty of which days have elapsed, according to the *Hindus*, from the time of the creation. That all this puerility, as it seems at first view, may be only an astronomical riddle, and allude to the apparent revolution of the fixed stars, of which the *Bráhmans* made a mystery, I readily admit, and am even inclined to believe; but so technical an arrangement excludes all idea of serious history. I am sensible how much these remarks will offend the warm advocates for *Indian* antiquity; but we must not sacrifice truth to a base fear of giving offence. That the *Védas* were actually written before the flood, I shall never believe; nor can we infer, from the preceding story, that the learned *Hindus* believe it; for the allegorical slumber of BRAHMA', and the theft of the sacred books, mean only, in simpler language, that *the human race was become corrupt;* but that the *Védas* are very ancient, and far older than other *Sanscrit* compositions, I will venture to assert from my own examination of them, and a comparison of their style with that of the *Puráns* and the *Dherma Sástra*. A similar comparison justifies me in pronouncing, that the excellent law-book ascribed to SWA'YAMBUVA MENU, though not even pretended to have been written by him, is more ancient than the BHA'GAVAT; but that it was composed in the first age of the world, the *Bráhmans* would find it hard to persuade me; and the date, which has been assigned to it, does not appear in either of the two copies, which I possess, or in any other that has been collated for me: in fact, the supposed date is comprized in a verse, which flatly contradicts the work itself; for it was not

MENU who composed the system of law, by the command of his father BRAHMA', but a holy personage, or demigod, named BHRIGU, who revealed to men what MENU had delivered at the request of him and other saints or patriarchs. In the *Mánava Sástra*, to conclude this digression, the measure is so uniform and melodious, and the style so perfectly *Sanscrit*, or *polished*, that the book must be more modern than the scriptures of MOSES, in which the simplicity, or rather nakedness, of the *Hebrew* dialect, metre, and style, must convince every unbiassed man of their superior antiquity.

I leave etymologists, who decide every thing, to decide whether the word MENU, or, in the nominative case, MENUS, has any connexion with MINOS, the lawgiver, and supposed son of JOVE. The *Cretans*, according to DIODORUS of *Sicily*, used to feign, that most of the great men, who had been deified in return for the benefits which they had conferred on mankind, were born in their island; and hence a doubt may be raised, whether MINOS was really a *Cretan*. The *Indian* legislator was the first, not the seventh, MENU, or SATYAVRATA, whom I suppose to be the SATURN of *Italy:* part of SATURN'S character, indeed, was that of a great lawgiver;

Qui genus indocile ac dispersum montibus altis
Composuit, *legesque dedit;*

and we may suspect that all the fourteen MENUS are reducible to one, who was called NUH by the *Arabs*, and probably by the *Hebrews;* though we have disguised his name by an improper pronunciation of it. Some near relation between the seventh MENU and the *Grecian* MINOS may be inferred from the singular character of the *Hindu* god, YAMA, who was also a child of the Sun, and thence named VAIVASWATA: he had too the same title with his brother, SRA'DDHADE'VA. Another of his titles was DHERMARA'JA, or *King of Justice;* and a third, PITRIPETI, or *Lord of the Patriarchs;* but he is chiefly distinguished as *judge of departed souls;* for the *Hindus* believe, that when a soul leaves its body, it immediately repairs to *Yamapur*, or the city of YAMA, where it receives a just sentence from him, and either ascends to *Swerga*, or the first heaven; or is driven down to *Narac*, the region of serpents; or assumes on earth the form of some animal, unless its offence had been such, that it ought to be condemned to a

vegetable, or even to a mineral, prison. Another of his names is very remarkable; I mean that of CA'LA, or *time*, the idea of which is intimately blended with the characters of SATURN and of NOAH; for the name CRONOS has a manifest affinity with the word *chronos*, and a learned follower of ZERA'TUSHT assures me, that, in the books which the the *Behdîns* hold sacred, mention is made of an *universal inundation*, there named the deluge of TIME.

It having been occasionally observed, that CERES was the poetical daughter of SATURN, we cannot close this head without adding, that the *Hindus* also have their *Goddess of Abundance*, whom they usually call LACSHMI', and whom they consider as the daughter (not of MENU, but) of BHRIGU, by whom the first code of sacred Ordinances was promulgated. She is also named PEDMA' and CAMALA', from the sacred lotos, or *Nymphœa;* but her most remarkable name is SRI', or, in the first case, SRI'S, which has a resemblance to the *Latin*, and means *fortune* or *prosperity*. It may be contended, that, although LACSHMI' may be figuratively called the CERES of *Hindustan*, yet any two or more idolatrous nations, who subsisted by agriculture, might naturally conceive a Deity to preside over their labours, without having the least intercourse with each other; but no reason appears why two nations should concur in supposing that Deity to be a female: one, at least, of them would be more likely to imagine, that the *Earth* was a Goddess, and that the God of Abundance rendered her fertile. Besides, in every ancient temples near *Gayá*, we see images of LACSHMI', with full breasts, and a *cord* twisted under her arm like a *horn of plenty*, which look very much like the old *Grecian* and *Roman* figures of CERES.

The fable of SATURN having been thus analysed, let us proceed to his descendants; and begin, as the Poet advises, with JUPITER, whose supremacy, thunder, and libertinism every boy learns from OVID; while his great offices of Creator, Preserver, and Destroyer, are not generally considered in the systems of *European* mythology. The *Romans* had, as we have before observed, many JUPITERS, one of whom was only the *Firmament* personified, as ENNIUS clearly expresses it:

Aspice hoc sublime candens, quem invocant omnes *Jovem.*

दैवानामल्लिकाख: INDRA

This JUPITER or DIESPITER is the *Indian* God of the visible heavens, called INDRA, or the *King*, and DIVESPETIR, or *Lord of the Sky*, who has also the charater of the *Roman* GENIUS, or Chief of the good spirits; but most of his epithets in *Sanscrit* are the same with those of the *Ennian* JOVE. His consort is named SACHI'; his celestial city, *Amarávatì;* his palace, *Vaijayanta;* his garden *Nandana;* his chief elephant *Airávat;* his charioteer, MA'TALI; and his weapon, *Vajra*, or the thunderbolt: he is the regent of winds and showers, and, though the East is peculiarly under his care, yet his *Olympus* is *Méru* or the north pole allegorically represented as a mountain of gold and gems. With all his power he is considered as a subordinate Deity, and far inferior to the *Indian* Triad, BRAHMA', VISHNU, and MAHA'DEVA or SIVA, who are three *forms* of one and the same Godhead: thus the principal divinity of the *Greeks* and *Latians*, whom they called ZEUS and JUPITER with irregular inflexions DIOS and JOVIS, was not merely *Fulminator*, the Thunderer, but, like the destroying power of *India*, MAGNUS DIVUS, ULTOR, GENITOR; like the preserving power, CONSERVATOR, SOTER, OPITULUS, ALTOR, RUMINUS, and, like the creating power, the *Giver of Life;* an attribute, which I mention here on the authority of CORNUTUS, a consummate master of mythological learning. We are advised by PLATO himself to search for the roots of *Greek* words in some barberous, that is, foreign, soil;

but, since I look upon etymological conjectures as a weak basis for historical inquiries, I hardly dare suggest, that ZEV, SIV, and JOV, are the same syllable differently pronounced: it must, however be admitted, that the *Greeks*, having no palatial *sigma*, like that of the *Indians*, might have expressed it by their *zéta*, and that the initial letters of *zugon* and *jugum* are (as the instance proves) easily interchangeable.

धाताईविश्वनाभुत: BRAHMA

Let us now descend, from these general and introductory remarks, to some particular observations on the resemblance of ZEUS or JUPITER to the triple divinity VISHNU, SIVA, BRAHMA'; for that is the order, in which they are expressed by the letters A, U, and M, which coalesce and form the mystical word O´M; a word, which never escapes the lips of a pious *Hindu*, who meditates on it in silence: whether the *Egyptiau* ON, which is commonly supposed to mean the Sun, be the *Sanscrit* monosyllable, I leave others to determine. It must always be remembered, that the learned *Indians*, as they are instructed by their own books, in truth acknowledge only One Supreme Being, whom they call BRAHME, or THE GREAT ONE in the neuter gender: they believe his Essence to be infinitely removed from the comprehension of any mind but his own; and they suppose him to manifest his power by the operation of his divine spirit, whom they name VISHNU, the *Pervader*, and NA'RA'YAN, or *Moving on the waters*, both in the masculine gender, whence he is often denominated the *First Male;* and by this power they believe, that the whole order of nature is preserved and supported; but the *Védántis*, unable to form a distinct idea of brute matter independent of mind, or to conceive that the work of Supreme Goodness was left a moment to itself, imagine that the Deity is ever present to his work, and constantly supports a series of perceptions, which, in one sense, they call *illusory*, though they cannot but admit the *reality* of all created forms, as far as the happiness of creatures can be affected by them. When they consider the divine power exerted in *creating*, or in giving existence to that which existed not before, they call the Deity BRAHMA' in the masculine gender also; and, when they view him in the light of *Destroyer*, or rather *Changer* of forms, they give him a thousand names, of which SIVA, I'SA or I'SWARA, RUDRA, HARA, SAMBHU, and MAHA'DE'VA or MAHE'SA, are the most common. The first operations of these three *Powers* are variously described in the different *Puránás* by a number of allegories, and from them we may deduce the *Ionian* Philosophy of *primeval water*, the doctrine of the Mundane Egg, and the veneration paid to the *Nymphæa*, or *Lotos*, which was anciently revered in *Egypt*, as it is at present in *Hindustán*, *Tibet*, and *Népal:* the *Tibetians* are said to embellish their temples and altars with it, and a native *Népal* made prostrations before it on entering my study, where the fine plant and beautiful flowers lay for examination. Mr. HOLWEL, in explaining his first plate, supposes BRAHMA' to be floating on a leaf of *betel* in the midst of the abyss; but it was manifestly intended by a bad painter for a lotos-leaf, or for that of the *Indian* fig-tree; nor is the species of pepper, known in *Bengal* by the name of *Támbúla*, and on the Coast of *Malabar* by that of *betel*, held sacred, as he asserts, by the *Hindus*, or necessarily cultivated under the inspection of *Bráhmans;* though, as the vines are tender, all the plantations of them are carefully secured, and ought to be cultivated by a particular tribe of *Súdras*, who are thence called *Támbúlís*.

That *water* was the primitive element and first work of the Creative Power, is the uniform opinion of the *Indian* Philosophers; but, as they give so particular an account of the general deluge and of the Creation, it can never be admitted, that their whole system arose

आदिमानामहविष्टु; VISHNU

from traditions concerning the flood only, and must appear indubitable, that their doctrine is in part borrowed from the opening of *Birásit* or *Genesis*, than which a sublimer passage, from the first word to the last, never flowed or will flow from any human pen: "*In the* "*beginning* GOD created the heavens and the earth.—And the earth "was void and waste, and darkness was on the face of the deep, and "the Spirit of GOD *moved upon* the face of the waters; and GOD said: "*Let Light be*—and *Light was.*" The sublimity of this passage is considerably diminished by the *Indian* paraphrase of it, with which MENU, the son of BRAHMA', begins his address to the sages, who consulted him on the formation of the universe: "This world, says he, "was all darkness, undiscernible, undistinguishable, altogether as in "a profound sleep; till the self-existent invisible GOD, making it "manifest with five elements and other glorious forms, perfectly dispelled the gloom. He, desiring to raise up various creatures by an "emanation from his own glory, first created the *waters*, and impressed them with a power of motion: by that power was produced "a golden Egg, blazing like a thousand suns, in which was born "BRAHMA', self-existing, the great parent of all rational beings. The "waters are called *nárà*, since they are the offspring of NERA (or "I'SWARA); and thence was NA'RA'YANA named, because his first "*ayana*, or *moving*, was on them.

"THAT WHICH IS, the invisible cause, enternal, self-existing, "but unperceived, becoming masculine *from neuter*, is celebrated "among all creatures by the name of BRAHMA'. That God, having "dwelled in the Egg, through revolving years, Himself meditating "on Himself, divided it into two equal parts; and from those halves "formed the heavens and the earth, placing in the midst the subtil "ether, the eight points of the world, and the permanent receptacle "of waters."

To this curious description, with which the *Mánava Sástra* begins, I cannot refrain from subjoining the four verses, which are the text of the *Bhágavat*, and are believed to have been pronounced by the Supreme Being to BRAHMA': the following version is most scrupulously literal.*

"Even I was even at first, not any other thing; that, which exists, unperceived; supreme: afterwards I AM THAT WHICH IS; and "he, who must remain, am I.

"Except the FIRST CAUSE, whatever may appear, and may not "appear, in the mind, know that to be the mind's MA'YA', (or *Delu-* "*sion)* as light, as darkness.

"As the great elements are in various beings, entering, yet not "entering, (that is, pervading, not destroying) thus am I in them, yet "not in them.

"Even thus far may inquiry be made by him, who seeks to "know the principle of mind, in union and separation, which must "be EVERY WHERE ALWAYS."

Wild and obscure as these ancient verses must appear in a naked verbal translation, it will perhaps be thought by many, that the poetry or mythology of *Greece* or *Italy* afford no conceptions more awfully magnificent: yet the brevity and simplicity of the *Mosaick* diction are unequalled.

As to the creation of the world, in the opinion of the *Romans*, OVID, who might naturally have been expected to describe it with learning and elegance, leaves us wholly in the dark, *which of the Gods was the actor in it:* other mythologists are more explicit; and we may rely on the authority of CORNUTUS, that the old *European* heathens considered JOVE (not the son of SATURN, but of the *Ether*, that is of an unknown parent) as the great *Life-giver*, and *Father of*

* See the Original, p. 33. Plate IV.

Gods and men; to which may be added the *Orphean* doctrine, preserved by PROCLUS, that "the abyss and empyreum, the earth and sea, the Gods and Goddesses, were produced by ZEUS or JUPITER." In this character he corresponds with BRAHMA'; and, perhaps, with that god of the *Babylonians*, (if we can rely on the accounts of their ancient religion) who, like BRAHMA', reduced the universe to order, and, like BRAHMA', *lost his head*, with the blood of which new animals were instantly formed: I allude to the common story, the meaning of which I cannot discover, that BRAHMA' had five heads, till one of them was cut off by NA'RA'YAN.

CUVERA

That, in another capacity, JOVE was the *Helper* and *Supporter* of all, we may collect from his old *Latin* epithets, and from CICERO, who informs us, that his usual name is a contraction of *Juvans Pater;* an etymology, which shows the idea entertained of his character, though we may have some doubt of its accuracy. CALLIMACHUS, we know, addresses him as *the bestower of all good, and of security from grief;* and, *since neither wealth without virtue, nor virtue without wealth, give complete happiness*, he prays, like a wise poet, for both. An *Indian* prayer for riches would be directed to LACSHMI', the wife of VISHNU, since the *Hindu* goddesses are believed to be the *powers* of their respective lords: as to CUVE'RA, the *Indian* PLUTUS, one of whose names is *Paulastya*, he is revered, indeed, as a magnificent Deity, residing in the palace of *Alacá*, or borne through the sky in a splendid car, named *Pushpaca*, but is manifestly subordinate, like the other seven genii, to the three principal Gods, or rather to the principal God considered in three capacities. As the soul of the world, or the pervading *mind*, so finely described by VIRGIL, we see JOVE represented by several *Roman* poets; and with great sublimity by LUCAN in the known speech of CATO concerning the *Ammonian* oracle, "JUPITER is, wherever we look, wherever we move." This is precisely the *Indian* idea of VISHNU, according to the four verses above exhibited, not that the *Bráhmans* imagine their male divinity to be the *divine Essence* of the great one, which they declare to be wholly incomprehensible; but, since the power of *preserving* created things by a superintending providence, belongs eminently to the Godhead, they hold that power to exist transcendently in the *preserving* member of the Triad, whom they suppose to be EVERY WHERE ALWAYS, not in substance, but in spirit and energy: here, however, I speak of the *Vaishnava's*; for the *Saiva's* ascribe a sort of pre-eminence to SIVA, whose attributes are now to be concisely examined.

ISWARA

It was in the capacity of Avenger and Destroyer, that JOVE encountered and overthrew the *Titans* and Giants, whom TYPHON,

BRIARUES TITYUS, and the rest of their fraternity, led against the god of *Olympus*; to whom an eagle brought *lightning* and *thunderbolts* during the warfare: thus, in a similar contest between SIVA and the *Daityas*, or children of DITI, who frequently rebelled against heaven, BRAHMA' is believed to have presented the god of destruction with *fiery shafts*. One of the many poems, entitled *Rámáyan*, the last book of which has been translated into *Italian*, contains an extraordinary dialogue between the crow *Bhushunda*, and a rational Eagle, named GARUDA, who is often painted with the face of a beautiful youth, and the body of an imaginary bird; and one of the eighteen *Puránas* bears his name and comprizes his whole history. M. SONNERAT informs us, that VISHNU is represented in some places riding on the GARUDA, which he supposes to be the *Pondicheri* Eagle of BRISSON, especially as the *Bráhmans* of the Coast highly venerate that class of birds, and provide food for numbers of them at stated hours: I rather conceive the *Garúda* to be a fabulous bird, but agree with him, that the *Hindu* god, who rides on it, resembles the ancient JUPITER. In the old temples at *Gayà*, VISHNU is either mounted on this poetical bird or attended by it together with a little page; but, lest an etymologist should find GANYMED in GARUD, I must observe that the *Sanscrit* word is pronounced *Garura*; though I admit, that the *Grecian* and *Indian* stories of the celestial bird and the page appear to have some resemblance. As the *Olympian* JUPITER fixed his court and held his councils on a lofty and brilliant mountain, so the appropriated seat of MAHA'DE'VA, whom the *Saiva's* consider as the Chief of the Deities, was mount *Cailása*, every splinter of whose rocks was an inestimable gem: his terrestrial haunts are the snowy hills of *Himálaya*, or that branch of them to the East of the *Brahmaputra*, which has the name of *Chandrasic'hara*, or the *Mountain of the Moon*. When, after all these circumstances, we learn that SIVA is believed to have *three* eyes, whence he is named also TRILO'CHAN, and know from PAUSANIAS, not only that *Triophthalmos* was an epithet of ZEUS, but that a statue of him had been found, so early as the taking of *Troy*, with *a third eye in his forehead*, as we see him represented by the *Hindus*, we must conclude, that the identity of the two Gods falls little short of being demonstrated.

In the character of *Destroyer* also we may look upon this *Indian* Deity as corresponding with the *Stygian* JOVE, or PLUTO; especially since CA'LI' or *Time*, in the feminine gender, is a name of his consort, who will appear hereafter to be PROSERPINE : indeed, if we can rely on a *Persian* translation of the *Bhágavat*, (for the original is not yet in my possession) the sovereign of *Pátála*, or the *Infernal Regions*, is the *King of Serpents*, named SE'SHANA'GA; for CRIHSNA is there said to have descended with his favourite ARJUN to the seat of that formidable divinity, from whom he instantly obtained the favour, which he requested, that the souls of a *Bráhman's* six sons, who had been slain in battle, might reanimate their respective bodies ; and SE'SHANA'GA is thus described : "He had a gorgeous appearance, with a thou-" sand heads, and, on each of them, a crown set with resplendent gems, " one of which was larger and brighter than the rest; his eyes gleamed " like flaming torches; but his neck, his tongues, and his body were " black; the skirts of his habiliment were yellow, and a sparkling jewel " hung in every one of his ears; his arms were extended, and adorned " with rich bracelets, and his hands bore the holy shell, the radiated " weapon, the mace for war, and the lotos." Thus PLUTO was often exhibited in painting and sculpture with a diadem and sceptre ; but himself and his equipage were of the blackest shade.

There is yet another attribute of MAHA'DE'VA, by which he is too visibly distinguished in the drawings and temples of *Bengal*. To destroy, according the *Védánti's* of *India*, the *Súfi's* of *Persia*, and many philosophers of our *European* schools, is only to *generate* and *reproduce* in another form : hence the god of *Destruction* is holden in this country to preside over *Generation ;* as a symbol of which he rides on a *white bull*. Can we doubt, that the loves and feats of JUPITER GENITOR (not forgetting the *white bull* of EUROPA) and his extraordinary title of LAPIS, for which no satisfactory reason is commonly given, have a connexion with the *Indian* phylosophy and mythology? As to the deity of *Lampsacus*, he was originally a mere scare-crow, and ought not to have a place in any mythological system ; and, in regard to BACCHUS, the God of *Vintage*, (between whose acts and those of JUPITER we find, as BACON observes, a wonderfull affinity) his *Ithyphallick* images, measures, and ceremonies alluded probably to the supposed relation of Love and Wine ; unless we believe them to have belonged originally to SIVA, one of whose names is *Vágís*, or BA'GI'S, and to have been afterwards improperly applied. Though, in an essay on the gods of *India*, where the *Bráhmans* are

positively forbidden to taste fermented liquors, we can have little to do with BACCHUS, as God of Wine, who was probably no more than the imaginary president over the vintage in *Italy*, *Greece*, and the lower *Asia ;* yet we must not omit SURA'DE'VI', the Goddess of Wine, who arose, say the *Hindus*, from the ocean, when it was churned with the mountain *Mandar :* and this fable seems to indicate, that the *Indians* came from a country, in which wine was anciently made and considered as a blessing; though the dangerous effects of intemperance induced their early legislators to prohibit the use of all spiritous liquors ; and it were much to be wished, that so wise a law had never been violated.

VARUNA

वरुणपारसामहम्

Here may be introduced the JUPITER *Marinus*, or NEPTUNE, of the *Romans*, as resembling MAHA'DE'VA in his *generative* character ; especially as the *Hindu* god is the husband of BHAVA'NI', whose relation to the *waters* is evidently marked by her image being restored to them at the conclusion of her great festival called *Durgótsava :* she is known also to have attributes exactly similar to those of VENUS *Marina*, whose birth from the sea-foam and splendid rise from the Conch, in which she had been cradled, have afforded so many charming subjects to ancient and modern artists; and it is very remarkable, that the

REMBHA' of INDRA'S court, who seems to correspond with the popular VENUS, or Goddess of Beauty, was produced, according to the *Indian* fabulists, from the froth of the churned ocean. The identity of the *triśúla* and the *trident*, the weapon of SIVA and of NEPTUNE, seems to establish this analogy; and the veneration paid all over *India* to the large buccinum, especially when it can be found with the spiral line and mouth turned from left to right, brings instantly to our mind the music of TRITON. The genius of water is VARUNA; but he, like the rest, is far inferior to MAHE'S'A, and even to INDRA, who is the prince of the beneficent genii.

This way of considering the gods as individual substances, but as distinct persons in distinct characters, is common to the *European* and *Indian* systems; as well as the custom of giving the highest of them the greatest number of names: hence, not to repeat what has been said of JUPITER, came the triple capacity of DIANA; and hence her petition in CALLIMACHUS, that she might be *polyonymous* or *many-titled*. The consort of SIVA is more eminently marked by these distinctions than those of BRAHMA' or VISHNU: she resembles the ISIS *Myrionymos*, to whom an ancient marble, described by GRUTER, is dedicated; but her leading names and characters are PA'RVATI', DURGA', BHAVA'NI.'

CARTICEYA

सेनानीनामहंस्कंदः

As the *Mountain-born* Goddess, or PA'RVATI', she has many properties of the *Olympian* JUNO: her majestic deportment, high spirit, and general attributes are the same; and we find her both on Mount *Cailása*, and at the banquets of the deities, uniformly the companion of her husband. One circumstance in the parallel is extremely singular: she is usually attended by her son CA'RTICE'YA, who rides on a *peacock*; and, in some drawings, his own robe seems to be spangled with eyes; to which must be added that, in some of her temples, a *peacock*, without a rider, stands near her image. Though CA'RTICE'YA, with his six faces and numerous eyes, bears some resemblance to ARGUS, whom JUNO employed as her principal wardour, yet, as he is a deity of the second class, and the commander of celestial armies, he seems clearly to be the ORUS of *Egypt* and the MARS of *Italy*: his name SCANDA, by which he is celebrated in one of the *Purànas*, has a connexion, I am persuaded, with the old SECANDER of *Persia*, whom the poets ridiculously confound with the *Macedonian*.

The attributes of DURGA', or *Difficult of access*, are also conspicuous in the festival above-mentioned, which is called by her name, and in this character she resembles MINERVA, not the peaceful inventress of the fine and useful arts, but PALLAS, armed with a helmet and spear: both represent heroic *Virtue*, or Valour united with Wisdom; both slew demons and giants with their own hands, and both protected the wise and virtuous, who paid them due adoration. As PALLAS, they say, takes her name from *vibrating* a lance, and usually appears in complete armour, thus CURIS, the old *Latian* word for a spear, was one of JUNO'S titles; and so, if GIRALDAS be correct, was HOPLOSMIA, which at *Elis*, it seems, meant a female dressed in panoply, or complete accoutrements. The *unarmed* MINERVA of the *Romans* apparently corresponds, as patroness of Science and Genius, with SERESWATI', the wife of BRAHMA', and the emblem of his principal *Creative Power*: both goddesses have given their names to celebrated grammatical works; but the *Sáreswata* of SARU'PA'CHA'RYA is far more concise as well as more useful and agreeable than the *Minerva* of SANCTIUS. The MINERVA of *Italy* invented the *flute*, and SERESWATI' presides over melody: the protectress of *Athens* was even, on the same accouut, surnamed MUSICE'.

Many learned mythologists, with GIRALDUS at their head, consider the peaceful MINERVA, as the ISIS of *Egypt*; from whose temple at

मगनश्चालिकंदर्प: CAMA

Sais a wonderful inscription is quoted by PLUTARCH, which has a resemblance to the four *Sanscrit* verses above exhibited as the text of the *Bhágavat:* "I am all, that hath been, and is, and shall be; and my "veil no mortal hath ever removed." For my part I have no doubt, that the I'SWARA and I'SI' of the *Hindus* are the OSIRIS and ISIS of the *Egyptians;* though a distinct essay in the manner of PLUTARCH would be requisite in order to demonstrate their identity: they mean, I conceive, the *Powers of Nature* considered as Male and Female; and ISIS, like the other goddesses, represents the active power of her lord, whose *eight* forms, under which he becomes visible to man, were thus enumerated by CA'LIDA'S near two thousand years ago: "*Water* "was the first work of the Creator; and *Fire* receives the oblation of "clarified butter, as the law ordains; the *Sacrifice* is performed with "solemnity; the *two Lights* of heaven distinguish time; the subtil "*Ether*, which is the vehicle of sound, pervades the universe; the "*Earth* is the natural parent of all increase; and by *Air* all things "breathing are animated: may I'SA, the *power* propitiously apparent "in these eight forms, bless and sustain you!" The *five* elements, therefore, as well as the Sun and Moon, are considered as I'SA or the *Ruler*, from which word I'SI' may be regularly formed, though I'SA'NI' be the usual name of his *active Power*, adored as the Goddess of Nature. I have not yet found in *Sanscrit* the wild, though poetical, tale of IO; but am persuaded, that, by means of the *Purànas*, we

shall in time discover all the learning of the *Egyptians* without decypherings their hieroglyphicks: the bull of I'SWARA seems to be APIS, or AP, as he is more correctly named in the true reading of a passage in JEREMIAH; and, if the veneration shown both in *Tibet* and *India* to so amiable and useful a quadruped as the cow, together with the *regeneration* of the LAMA himself, have not some affinity with the religion of *Egypt* and the idolatry of *Israël*, we must at least allow that circumstances have wonderfully coincided. BHAVA'NI' now demands our attention; and in this character I suppose the wife of MAHA'DE'VA to be as well the JUNO *Cinxia* or LUCINA of the *Romans* (called also by them DIANA *Solvizona*, and by the *Greeks* ILITHYIA) as VENUS herself; not the *Italian* queen of laughter and jollity, who, with her nymphs and graces, was the beautiful child of poetical imagination, and answers to the *Indian* REMBHA' with her celestial train of *Apsará's*, or damsels of paradise; but VENUS *Urania*, so luxuriantly painted by LUCRETIUS, and so properly invoked by him at the opening of a poem on nature; VENUS, presiding over *generation*, and, on that account, exhibited sometimes of both sexes, (an union very common in the *Indian* sculptures) as in her *bearded* statue at *Rome*, in the images perhaps called *Hermathena*, and in those figures of her, which had the form of a *conical marble;* "for the reason of which figure we are left, says TACITUS, in "the dark:" the reason appears too clearly in the temples and paintings of *Hindustan;* where it never seems to have entered the heads of the legislators or people that any thing natural could be offensively obscene; a singularity which pervades all their writings and conversation, but is no proof of depravity in their morals. Both PLATO and CICERO speak of EROS, or the Heavenly CUPID, as the son of VENUS and JUPITER; which proves, that the monarch of *Olympus* and the Goddess of Fecundity were connected as MAHA'DE'VA and BHAVA'NI': the God CA'MA, indeed, had MA'YA' and CASYAPA, or *Uranus*, for his parents, at least according to the mythologists of *Cashmír;* but, in most respects, he seems the twin-brother of CUPID with richer and more lively appendages. One of his many epithets is *Dípaca*, the *Inflamer*, which is erroneously written *Dípuc;* and I am now convinced, that the sort of resemblance, which has been observed between his *Latin* and *Sanscrit* names, is accidental: in each name the three first letters are the *root*, and between them there is no affi-

30

nity. Whether any mythological connexion subsisted between the *amaracus*, with the fragrant leaves of which HYMEN bound his temples, and the *tulasí of India*, must be left undetermined: the botanical relation of the two plants (if *amaracus* be properly translated *marjoram)* is extremely near.

GANGA

त्रोतलामस्निनादवी ३१

One of the most remarkable ceremonies, in the festival of the *Indian* Goddess, is that before-mentioned of casting her image *into the river:* the *Pandits*, of whom I inquired concerning its origin and import, answered, "that it was prescribed by the *Véda*, they knew not why;" but this custom has, I conceive, a relation to the doctrine, that *water* is a *form* of I'SWARA, and consequently of I'SA'NI', who is even represented by some as the patroness of that element, to which her figure is restored, after having received all due honours on *earth*, which is considered as another *form* of the God of Nature, though subsequent, in the order of Creation, to the primeval fluid. There seems no decisive proof of one original system among idolatrous nations in the worship of river-gods and river-goddesses, nor in the homage paid to their streams, and the ideas of purification annexed to them: since *Greeks*, *Italians*, *Egyptians*, and *Hindus* might (without any communication with each other) have adored the several divinities of their great rivers, from which they derived pleasure, health, and abundance. The notion of Doctor MUSGRAVE, that large rivers were supposed, from their strength and rapidity, to be conducted by Gods, while rivulets only were protected by female deities, is, like most other notions of grammarians on the genders of nouns, overthrown by facts. Most of the great *Indian* rivers are feminine; and the three goddesses of the waters, whom the *Hindus* chiefly venerate, are GANGA', who sprang, like armed PALLAS, from the head of the *Indian* JOVE; YAMUNA', daughter of the Sun, and SERESWATI': all three meet at *Prayága*, thence called *Trevéni*, or *the three plaited locks;* but SERESWATI', according to the popular belief, sinks under ground, and rises at another *Trivéni* near *Húgli*, where she rejoins her beloved GANGA'. The *Brahmaputra* is, indeed, a male river; and, as his name signifies the Son of BRAHMA', I thence took occasion to feign that he was married to GANGA', though I have not yet seen any mention of him, as a God, in the *Sanscrit* books.

रम:प्रबृश्लामहहृ RAMA

Two incarnate deities of the first rank, RA'MA and CRISHNA, must now be introduced, and their several attributes distinctly explained. The first of them, I believe, was the DIONYSOS of the *Greeks*, whom they named BROMIUS, without knowing why, and BUGENES, when they represented him *horned,* as well as LYAIOS and ELEUTHERIOS, the Deliverer, and TRIAMBOS or DITHYRAMBOS, the Triumphant: most of those titles were adopted by the *Romans,* by whom he was called BRUMA, TAURIFORMIS, LIBER, TRIUMPHUS; and both nations had records or traditionary accounts of his *giving laws* to men and deciding their contests, of his improving navigation and commerce, and, what may appear yet more observable, of his conquering *India* and other countries with an army of *Satyrs,* commanded by no less a personage than PAN; whom LILIUS GIRALDUS, on what authority I know not, asserts to have resided in *Iberia,* "when he had returned, "says the learned mythologist, from the *Indian* war, in which he ac-"companied, BACCHUS." It were superfluous in a mere essay, to run any length in the parallel between this *European* God and the sovereign of *Ayódhyà,* whom the *Hindus* believe to have been an appearance on earth of *Preserving Power;* to have been a Conqueror of the highest renown, and the Deliverer of nations from tyrants, as well as of his consort SI'TA' from the giant RA'VAN, king of *Lancá,* and to have commanded in chief a numerous and intrepid race of those large *Monkeys,* which our naturalists, or some of them, have denominated *Indian* Satyrs: his General, the Prince of Satyrs, was named HANUMAT, or *with high cheek-bones;* and, with workmen of such agility, he soon raised a bridge of rocks over the sea, part of which, say the *Hindus,* yet remains; and it is, probably, the series of rocks, to which the *Muselmans* or the *Portuguese* have given the foolish name of ADAM'S (it should be called RA'MA'S) bridge. Might not this army of Satyrs have been only a race of mountaineers, whom RA'MA, if such a monarch ever existed, had civilized? However that may be, the large breed of *Indian* Apes is at this moment held in high veneration by the *Hindus,* and fed with devotion by the *Bráhmans,* who seem, in two or three places on the banks of the *Ganges,* to have a regular endowment for the support of them: they live in tribes of three or four hundred, are wanderfully gentle, (I speak as an eye-witness) and appear to have some kind of order and subordination in their little sylvan polity. We must not omit, that the father of *Hanumat* was the God of Wind, named PAVAN, one of the eight Genii; and, as PAN improved the pipe by adding six reeds, and "played exquisitely on the cithern a "few moments after his birth," so one of the four systems of *Indian*

music bears the name of HANUMAT, or HANUMA'N in the nominative, as its inventor, and is now in general estimation.

The war of *Lancá* is dramatically represented at the festival of RA'MA on the ninth day of the new moon of *Chaitra;* and the drama concludes (says HOLWEL, who had often seen it) with an exhibition of the fire-ordeal, by which the victor's wife SI'TA' gave proof of her connubial fidelity: "the dialogue, he adds, is taken from one "of the Eighteen holy books," meaning, I suppose, the *Purànas;* but the *Hindus* have a great number of regular dramas at least two thousands years old, and among them are several very fine ones on the story of RA'MA. The first poet of the *Hindus* was the great VA'LMI'C, and his *Rámáyan* is an Epick Poem on the same subject, which, in unity of action, magnificence of imagery, and elegance of style, far surpasses the learned and elaborate work of NONNUS, entitled *Dionysiaca,* half of which, or twenty-four books, I perused with great eagerness, when I was very young, and should have travelled to the conclusion of it, if other pursuits had not engaged me: I shall never have leisure to compare the *Dionysiacks* with the *Rámáyan,* but am confident, that an accurate comparison of the two poems would prove DIONYSOS and RA'MA to have been the same person; and I incline to think, that he was RA'MA, the son of CU'SH, who might have established the first regular government in this part of *Asia.* I had almost forgotten, that *Meros* is said by the *Greeks* to have been a mountain of *India,* on which their DIONYSOS was born, and that *Méru,* though it generally means the north pole in the *Indian* geography, is also a mountain near the city of *Naishada* or *Nysa,* called by the *Grecian* geographers *Dionysopolis,* and universally celebrated in the *Sanscrit* poems; though the birth-place of RA'MA is supposed to have been *Ayódhyà* or *Audh.* That ancient city extended, if we believe the *Bráhmans,* over a line of ten *yojans,* or about forty miles, and the present city of *Lac'hnau,* pronounced *Lucnow,* was only a lodge for one of its gates, called *Lacshmanadwára,* or the gate of LACSHMAN, a brother of RA'MA: M. SONNERAT supposes *Ayódhyà* to have been *Siam;* a most erroneous and unfounded supposition! which would have been of little consequence, if he had not grounded an argument on it, that RA'MA was the same person with BUDDHA, who must have appeared many centuries after the conquest of *Lancá.*

ह्रीनंबाछदेवोस्मि CRISHNA

The second great divinity, CRISHNA, passed a life, according to the *Indians*, of a most extraordinary and incomprehensible nature. He was the son of DE'VACI' by VASUDE'VA; but his birth was concealed through fear of the tyrant CANSA, to whom it had been predicted, that a child born at that time in that family would destroy him: he was fostered, therefore, in *Mat'hurá* by an honest herdsman, surnamed ANANDA, or *Happy*, and his amiable wife YASO'DA', who, like another PALES, was constantly occupied in her pastures and her dairy. In their family were a multitude of young *Gópa's*, or *Cowherds*, and beautiful *Gópí's*, or *Milkmaids*, who were his play-fellows during his infancy; and, in his early youth, he selected *nine* damsels as his favourites, with whom he passed his gay hours in dancing, sporting, and playing on his flute. For the remarkable number of his *Gópí's* I have no authority but a whimsical picture, where *nine* girls are grouped in the form of an elephant, on which he sits and pipes; and unfortunately, the word *nava* signifies both *nine* and *new*, or young; so that, in the following stanza, it may admit of two interpretations:

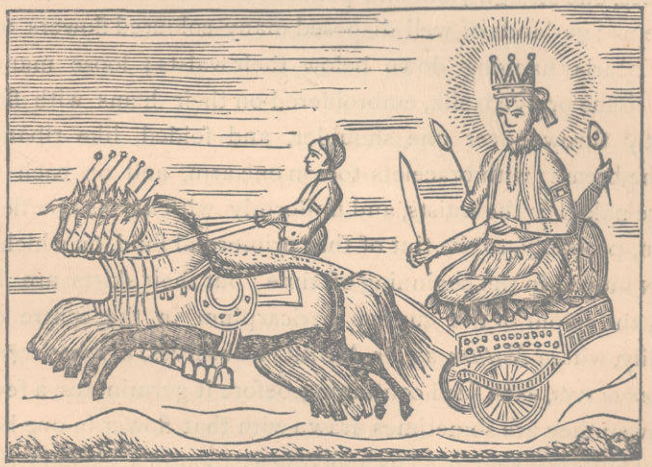
taraníijápulinè navaballaví
perisadá saha célicutúhalát
drutavilamwitacháruvihárinam
herimaham hrĭdayéna sadá vahé

"I bear in my bosom continually that God, who, for sportive re-

"creation with a train of *nine* (young) dairy-maids, dances gracefully, "now quick now slow, on the sands just left by the Daughter of the Sun."

Both he and the three RA'MA'S are described as youths of perfect beauty; but the princesses of *Hindustan*, as well as the damsels of NANDA'S farm, were passionately in love with CRISHNA, who continues to this hour the darling God of the *Indian* women. The sect of *Hindus*, who adore him with enthusiastic, and almost exclusive, devotion, have broached a doctrine, which they maintain with eagerness, and which seems general in these provinces; that he was distinct from all the *Avatárs*, who had only an *ansa*, or portion, of his divinity; while CRISHNA was the *person* of VISHNU himself in a human form: hence they consider the third RA'MA, his elder brother, as the eighth *Avatár* invested with an *emanation* of his divine radiance; and, in the principal *Sanscrit* dictionary, compiled about two thousand years ago, CRISHNA, VA'SADE'VA, GO'VINDA, and other names of Shepherd God, are intermixed with epithets of NA'RA'YAN, or the Divine Spirit. All the *Avatárs* are painted with gemmed *Ethiopian*, or *Parthian*, coronets; with rays encircling their heads; jewels in their ears; two necklaces, one straight, and one pendent on their bosoms with dropping gems; garlands of well-disposed many-coloured flowers, or collars of pearls, hanging down below their waists; loose mantles of golden tissue or dyed silk, embroidered on their hems with flowers, elegantly thrown over one shoulder, and folded, like ribands, across the breast; with bracelets too on one arm, and on each wrist: they are naked to the waists, and uniformly with *dark azure* flesh, in allusion, probably, to the tint of that primordial fluid, on which NA'RA'YAN moved in the beginning of time; but their skirts are bright yellow, the colour of the curious pericarpium in the centre of the water-lily, where *Nature*, as Dr. MURRAY observes, *in some degree discloses her secrets*, each seed containing, before it germinates, a few perfect leaves: they are sometimes drawn with that flower in one hand; a radiated elliptical ring, used as a missile weapon, in a second; the sacred shell, or left-handed buccinum, in a third; and a mace or battle-ax, in a fourth; but CRISHNA, when he appears, as he somtimes does appear, among the *Avatárs*, is more splendidly decorated than any, and wears a rich garland of sylvan flowers, whence he is named VANAMA'LI, as low as his ankles, which are adorned with strings of pearls.

Dark blue, approaching to *black*, which is the meaning of the word *Crishna*, is believed to have been his complexion ; and hence the large bee of that colour is consecrated to him, and is often drawn fluttering over his head : that azure tint, which approaches to blackness, is peculiar, as we have already remarked, to VISHNU ; and hence, in the great reservoir or cistern at *Cátmándu* the capital of *Népal*, there is placed in a recumbent posture a large well-proportioned image of *blue* marble, representing NA'RA'YAN floating on the waters. But let us return to the actions of CRISHNA ; who was not less heroic, than lovely, and, when a boy, slew the terrrible serpent *Cáliya* with a number of giants and monsters : at a more advanced age, he put to death his cruel enemy CANSA ; and, having taken under his protection the king YUDHISHT'HIR and the other *Pándus*, who had been grievously oppressed by the *Curus*, and their tyrannical chief, he kindled the war described in the great epic poem, entitled the *Mahábhárat*, at the prosperous conclusion of which he returned to his heavenly seat in *Vaicont'ha*, having left the instructions comprized in the *Gítà* with his disconsolate friend ARJUN, whose grandson became sovereign of *India*.



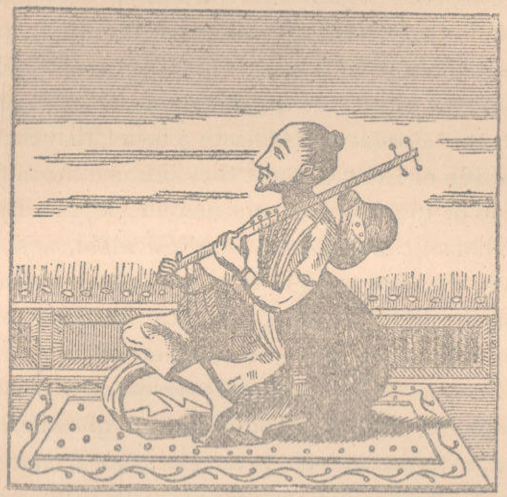
ज्योतिषांरविरंशुमान् SURYA

In this picture it is impossible not to discover, at the first glance, the features of APOLLO, surnamed *Nomios*, or the *Pastoral*, in *Greece*,

and OPIFER in *Italy* ; who fed the herds of ADMETUS, and slew the serpent *Python* ; a God amorous, beautiful, and warlike : the word *Góvinda* may be literally translated *Nomios*, as *Césava* is *Crinitus*, or *with fine hair* ; but whether *Gópála*, or the *herdsman*, has any relation to *Apollo*, let our Etymologists determine. Colonel VALLANCY, whose learned inquiries into the ancient literature of *Ireland* are highly interesting, assures me, that *Crishna* in *Irish* means the SUN ; and we find APOLLO and SOL considered by the *Roman* poets as the same deity : I am inclined, indeed, to believe, that not only CRISHNA or VISHNU, but even BRAHMA' and SIVA, when united, and expressed by the mystical word O'M, were designed by the first idolaters to represent the Solar fire ; but PHŒBUS, or the *orb of the Sun* personified, is adored by the *Indians* as the God SU'RYA, whence the sect, who pay him particular adoration, are called *Sauras :* their poets and painters describe his car as drawn by seven green horses, preceded by ARUN, or the *Dawn*, who acts as his charioteer, and followed by thousands of Genii worshipping him and modulating his praises. He has a multitude of names, and among them twelve epithets or titles, which denote his distinct *powers* in each of the twelve months : those *powers* are called *Adityas*, or sons of ADITI by CASYAPA, the *Indian* URANUS ; and one of them has, according to some authorities, the name of VISHNU or *Pervader*. SU'RYA is believed to have descended frequently from his car in a human shape, and to have left a race on earth, who are equally renowned in the *Indian* stories with the *Heliadai* of *Greece :* it is very singular, that his two sons called ASWINAU or ASWINI'CUMA'RAU, in the dual, should be considered as twin-brothers, and painted like CASTOR and POLLUX, but they have each the character of ÆSCULAPIUS among the Gods, and are believed to have been born of a nymph, who, in the form of a mare, was impregnated with sun-beams. I suspect the whole fable of CASYAPA and his progeny to be astronomical ; and cannot but imagine, that the *Greek* name CASSIOPEIA has a relation to it. Another great *Indian* family are called the *Children of the Moon*, or CHANDRA ; who is a male Deity, and consequently not to be compared with ARTEMIS or DIANA ; nor have I yet found a parallel in *India* for the Goddess of the *Chase*, who seems to have been the daughter of an *European* fancy, and very naturally created by the invention of *Bucolic* an *Georgic* poets : yet, since the *Moon* is a *form* of I'SWARA, the God of Nature, according to the verse of CA'LIDA'SA, and since I'SA'NI has been shown to be his *consort* or *power*, we may consider her, in one of her characters, as LUNA; especially as we shall soon be convinced that, in the shades below, she corresponds with the HECATE of *Europe*.

The worship of Solar, or Vestal, *Fire* may be ascribed, like that of OSIRIS and ISIS, to the second source of mythology, or an enthusiastic admiration of nature's wonderful powers; and it seems, as far as I can yet understand the *Védas*, to be the principal worship recomended in them. We have seen, that MAHA'DE'VA himself is personated by *Fire*; but, subordinate to him, is the God AGNI, often called PA'VACA, or the *Purifier*, who answers to the VULCAN of *Egypt*, where he was a Deity of high rank; and his wife SWA'HA' resembles the younger VESTA, or VESTIA, as the *Eolians* pronounced the *Greek* work for a *hearth*: BHAVA'NI, or VENUS, is the consort of the Supreme Destructive and Generative Power; but the *Greeks* and *Romans*, whose system is less regular than that of the *Indians*, married her to their *divine artist*, whom they also named HEPHAISTOS and VULCAN, and who seems to be the *Indian* VISWACARMAN, the *forger of arms* for the Gods, and inventor of the *agnystra*, or *fiery shaft*, in the war between them and the *Daityas* or *Titans*. It is not easy here to refrain from observing (and, if the observation give offence in *England*, it is contrary to my intention) that the newly discovered planet should unquestionably be named VULCAN; since the confusion of analogy in the names of the planets is inelegant, unscholarly, and unphilosophical: the name URANUS is appropriated to the firmament; but VULCAN, the slowest of the Gods, and, according to the *Egyptian* priests, the oldest of them, agrees admirably with an orb, which must perform its revolution in a very long period; and, by giving it this denomination, we shall have seven primary planets with the names of as many *Roman* Deities, MERCURY, VENUS, TELLUS, MARS, JUPITER, SATURN, VULCAN.

It has already been intimated, that the MUSES and NYMPHS are the GO'PYA of *Math'urà*, and of *Góverdhan*, the *Parnassus* of the *Hindus*; and the lyric poems of JAYADE'VA will fully justify this opinion; but the *Nymphs* of *music* are the *thirty* RA'GINI'S or *Female Passions*, whose various functions and properties are so richly delineated by the *Indian* painters and so finely described by the poets; but I will not anticipate what will require a saparate Essay, by en-



देवर्षीणांचनारदः। NAREDA

larging here on the beautiful allegories of the *Hindus* in their system of musical modes, which they called RA'GAS, or *Passions*, and supposed to be Genii or Demigods. A very distinguished son of BRAHMA' named NA'RED, whose actions are the subject of a *Purána*, bears a strong resemblance to HERMES or MERCURY: he was a wise lagislator, great in arts and in arms, an eloquent messenger of the Gods either to one another or to favoured mortals, and a musician of exquisite skill; his invention of the *Víná*, or *Indian* lute, is thus described in the poem entitled *Mágha*: "NA'RED sat watching from time "to time his large *Víná*, which, by the impulse of the breeze, yielded "notes, that pierced successively the regions of his ear, and proceeded "by musical intervals." The law tract, supposed to have been revealed by NA'RED, is at this hour cited by the *Pandits*; and we cannot, therefore, believe him to have been the patron of *Thieves*; though an innocent theft of CRISHNA's cattle, by way of putting his divinity to a proof, be strangely imputed, in the *Bhágavat*, to his father BRAHMA'.

The last of the *Greek* or *Italian* divinities, for whom we find a parallel in the Pantheon of *India* is the *Stygian* or *Tauric* DIANA, otherwise named HECATE, and often confounded with PROSERPINE; and there can be no doubt of her identity with CA'LI', or the wife of SIVA in his character of the *Stygian* JOVE. To this black Goddess with a collar of golden skulls, as we see her exhibited in all her principal temples, *human sacrifices* were anciently offered, as the *Védas* enjoined; but, in the present age, they are absolutely prohibited, as are also the sacrifices of bulls and horses: kids are still offered to her; and, to palliate the cruelty of the slaughter, which gave such offence to BUDDHA, the *Bráhmans* inculcate a belief, that the poor victims rise in the heaven of INDRA, where they become the musicians of his band. Instead of the obsolete, and now illegal, sacrifices of a man, a bull, and a horse, called *Neramédha*, *Gómédha*, and *Aśwamédha*, the powers of nature are thought to be propitiated by the less bloody ceremonies at the end of autumn, when the festivals of CA'LI' and LACSHMI' are solemnized nearly at the same time: now, if it be asked, how the Goddess of Death came to be united with the mild patroness of Abundance, I must propose another question, "How came "PROSERPINE to be represented in the *European* system as the daugh-"ter of CERES?" Perhaps, both questions may be answered by the proposition of natural philosophers, that "the apparent destruction of a "substance is the production of it in a different form." The wild music of CA'LI''S priests at one of her festivals brought instantly to my recollection the *Scythian* measures of DIANA'S adorers in the splendid opera of IPHIGENIA in *Tauris*, which GLUCK exhibited at *Paris* with less genius, indeed, than art, but with every advantage that an orchestra could supply.

That we may not dismiss this assemblage of *European* and *Asiatic* divinities with a subject so horrid as the altars of HECATE and CA'LI', let us conclude with two remarks, which properly, indeed, belong to the *Indian* Philosophy, with which we are not at present concerned. First; *Elysium* (not the place, but the bliss enjoyed there, in which sense MILTON uses the word) cannot but appear, as described by the poets, a very tedious and insipid kind of enjoyment: it is, however, more exalted than the temporary *Elysium* in the court of INDRA, where the pleasures, as in MAHAMMED'S paradise, are wholly sensual; but the *Mucti*, or *Elysian* happiness of the *Védánta* School is far more sublime; for they represent it as a total absorption, though not such as to destroy consciousness, in the divine essence; but, for the reason before suggested, I say no more of this idea of beautitude, and forbear touching on the doctrine of transmigration and the similarity of the *Védánta* to the *Sicilian*, *Italic*, and old *Academic* Schools.

Secondly; in the mystical and elevated character of PAN, as a personification of the *Universe*, according to the notion of lord BACON, there arises a sort of similitude between him and CRISHNA considered as NA'RA'YAN. The *Grecian* god plays divinely on his reed, to express, we are told, etherial harmony; he has his attendant Nymphs of the pastures and the dairy; his face is as radiant as the sky, and his head illumined with the horns of a crescent; whilst his lower extremities are deformed and shaggy, as a symbol of the vegetables, which the earth produces, and of the beasts, who roam over the face of it: now we may compare this portrait, partly with the general character of CRISHNA, the Shepherd God, and partly with the description in the *Bhágavat* of the divine spirit exhibited *in the form of this Universal World*; to which we may add the following story from the same extraordinary poem. The Nymphs had complained to YASO'DA', that the child CRISHNA had been drinking their curds and milk: on being reproved by his foster-mother for this indiscretion, he requested her to examine his mouth; in which, to her just amazement, she beheld the *whole universe* in all its plenitude of magnificence.

We must not be surprized at finding, on a close examination, that the characters of all the pagan deities, male and female, melt into each other, and at last into one or two; for it seems a well-founded opinion, that the whole crowd of gods and goddesses in ancient *Rome*, and modern *Váránes*, mean only the powers of nature, and principally those of the SUN, expressed in a variety of ways and by a multitude of fanciful names.

Thus have I attempted to trace, imperfectly at present for want of ampler materials, but with a confidence continually increasing as I advanced, a parallel between the Gods adored in three very different nations, *Greece*, *Italy*, and *India*; but, which was the original system and which the copy, I will not presume to decide; nor are we likely, I believe, to be soon furnished with sufficient grounds for a decision: the fundamental rule, that *natural, and most human, operations proceed from the simple to the compound*, will afford no assistance on this point; since neither the *Asiatic* nor *European* system has any simplicity in it; and both are so complex, not to say absurd, however intermixed with the beautiful and the sublime, that the honor, such as it is, of the invention cannot be allotted to either with tolerable certainty.

Since *Egypt* appears to have been the grand source of knowledge for the *western*, and *India* for the more *eastern*, parts of the globe, it may seem a material question, whether the *Egyptians* communicated their Mythology and Philosophy to the *Hindus*, or conversely; but what the learned of *Memphis* wrote or said concerning *India*, no mortal knows; and what the learned of *Váránes* have asserted, if any thing, concerning *Egypt*, can give us little satisfaction: such circumstancial evidence on this question as I have been able to collect, shall nevertheless be stated; because, unsatisfactory as it is, there may be something in it not wholly unworthy of notice; though after all, whatever colonies may have come from the *Nile* to *Ganges*, we shall, perhaps, agree at last with Mr. BRYANT, that *Egyptians*, *Indians*, *Greeks*, and *Italians*, proceeded originally from one central place, and that the same people carried their religion and sciences into *China* and *Japan:* may we not add, even to *Mexico* and *Peru?*

Every one knows, that the true name of *Egypt* is *Miśr*, spelled with a palatial sibilant both in *Hebrew* and *Arabic:* it seems in *Hebrew* to have been the proper name of the first settler in it; and, when the *Arabs* use the word for *a great city*, they probably mean *a city like the capital of Egypt*. Father MARCO, *Roman* Missionary, who, though not a scholar of the first rate, is incapable, I am persuaded, of deliberate falsehood, lent me the last book of a *Rámáyan*, which he had translated through the *Hindi* into his native language, and with it a short vocabulary of Mythological and Historical names, which had been explained to him by the *Pandits* of *Betíyà*, where he had long resided: one of the articles in his little dictionary was, "*Tirút*, a town and province, in which the priests from *Egypt* settled;" and, when I asked him, what name *Egypt* bore among the *Hindus*, he said *Miśr*, but observed, that they sometimes confounded it with *Abyssinia*. I perceived, that his memory of what he had written was correct; for *Miśr*, was another word in his index, "from which coun- "try, he said, came the *Egyptian* priests, who settled in *Tirút*." I suspected immediately, that his intelligence flowed from the *Muselmans*, who call sugar-candy *Misrí* or *Egyptian;* but, when I examined him closely, and earnestly desired him to recollect from whom he had received his information, he repeatedly and positively declared, that "it had been given him by several *Hindus*, and particularly by "a *Bráhman*, his intimate friend, who was reputed a considerable "*Pandit*, and had lived three years near his house." We then conceived, that the seat of his *Egyptian* colony must have been *Tiróhit*, commonly pronounced *Tirút*, and anciently called *Mit'hilà*, the principal town of *Janacades'a*, or north *Bahàr;* but MAHE'SA *Pandit*, who was born in that very district, and who submitted patiently to a long examination concerning *Miśr*, overset all our conclusions: he denied, that the *Bráhmans* of his country were generally surnamed MISR, as we had been informed; and said, that the addition of MISRA to the name of VA'CHESPETI, and other learned authors, was a title formerly conferred on the writers of *miscellanies*, or *compilers* of various tracts on religion or science, the word being derived from a root signifying to *mix*. Being asked, where the country of *Miśr* was, "There are two, he answered, of that name; one of them "*in the west* under the dominion of *Muselmáns*, and another, which "all the *Sástras* and *Purànas* mention, in a mountainous region to "the *north* of *Ayódhyà*:" it is evident, that by the first he meant *Egypt*, but what he meant by the second, it is not easy to ascertain. A country, called *Tiruhut* by our geographers, appears in the maps between the north-eastern frontier of *Audh* and the mountains of *Népal;* but whether that was the *Tirút* mentioned to father MARCO by his friend of *Betíya*, I cannot decide. This only I know with certainty, that *Misra* is an epithet of two *Bráhmans* in the drama of SACONTALA', which was written near a century before the birth of CHRIST; that some of the greatest lawyers, and two of the finest dramatic poets, of *India* have the same tittle; that we hear it frequently in court added to the names of *Hindu* parties; and that none of the *Pandits*, whom I have since consulted, pretend to know the true meaning of the word, as a proper name, or to give any other explanation of it than that it is *a surname of* Bráhmans *in the west*. On the account given to Colonel KYD by the old *Rájà* of *Crishnanagar*, "concerning *traditions* "among the *Hindus*, that some *Egyptians* had "settled in this country," I cannot rely; because I am credibly informed by some of the *Rájà's* own family, that he was not a man of solid learning, though he possessed curious books, and had been attentive to the conversation of learned men: besides, I know that his son and most of his kinsmen have been dabblers in *Persian* literature, and believe them very likely, by confounding one source of information with another, to puzzle themselves and mislead those, with whom they converse. The word *Miśr*, spelled also in *Sanscrit* with a palatial sibilant, is very remarkable; and, as far as Etymology can help us, we may safely derive *Nilus* from the *Sanscrit* word *níla*, or *blue;* since DIONYSIUS expressly calls the waters of that river "an *azure* stream;" and, if we can depend on MARCO'S *Italian* version of the *Rámáyan*, the name of *Níla* is given to a lofty and sacred mountain with a summit of pure gold, from which flowed *a river of clear, sweet, and fresh water.* M. SONNERAT refers to a dissertation by Mr. SCHMIT, which gained a prize at the Academy of Inscriptions, "On an *Egyptian* Colony established in *India*:" it would be worth while to examine his authorities, and either to overturn or verify them by such higher authorities, as are now accessible in these provinces. I strongly incline to think him right, and to believe that *Egyptian* priests have actually come from the *Nile* to the *Gangà* and *Yamunà*, which the *Bráhmans* most assuredly would never have left: they might indeed, have come either to be instructed or to instruct; but it seems more probable, that they visited the *Sarmans* of *India*, as the sages of *Greece* visited them, rather to acquire than to impart knowledge; nor is it likely, that the self-sufficient *Bráhmans* would have received them as their preceptors.

Be all this as it may, I am persuaded, that a connexion subsisted between the old idolatrous nations of *Egypt, India, Greece*, and *Italy*, long before they migrated to their several settlements, and consequently before the birth of MOSES; but the proof of this proposition will in no degree affect the truth and sanctity of the *Mosaic* History, which, if confirmation were necessary, it would rather tend to confirm. The *Divine Legate*, educated by the daughter of a king, and in all respects highly accomplished, could not but know the mythological system of *Egypt;* but he must have condemned the superstitions of that people, and despised the speculative absurdities of their priests; though some of their traditions concerning the creation and the flood were grounded on truth. Who was better acquainted with the mythology of *Athens* than SOCRATES? Who more accurately versed in the Rabbinical doctrines than PAUL? Who possessed clearer ideas of all ancient astronomical systems than NEWTON, or of scholastic metaphysics than LOCKE? In whom could the *Romish* Church have had a more formidable opponent than in CHILLINGWORTH, whose deep knowledge of its tenets rendered him so competent to dispute them? In a word, who more exactly

knew the abominable rites and shocking idolatry of *Canaan* than MOSES himself? Yet the learning of those great men only incited them to seek other sources of truth, piety, and virtue, than those in which they had long been immersed. There is no shadow then of a foundation for an opinion, that MOSES borrowed the first nine or ten chapters of *Genesis* from the literature of *Egypt:* still less can the adamantine pillars of our *Christian* faith be moved by the result of any debates on the comparative antiquity of the *Hindus* and *Egyptians*, or of any inquiries into the *Indian* Theology. Very respectable natives have assured me, that one or two missionaries have been absurd enough, in their zeal for the conversion of the *Gentiles*, to urge, "that the *Hindus* were even now almost *Christians*, because their BRAHMA', VISHNU, and MAHE'SA, were no other than the *Christians* Trinity;" a sentence, in which we can only doubt, whether folly, ignorance, or impiety predominates. The three *powers, creative, preservative*, and *destructive*, which the *Hindus* express by the triliteral word *O'm*, were grossly ascribed by the first idolaters to the *heat, light*, and *flame* of their mistaken divinity, the Sun; and their wiser successors in the east, who perceived that the sun was only a created thing, applied those powers to its Creator; but the *Indian* Triad, and that of PLATO, which he calls the Supreme Good, the Reason, and the Soul, are infinitely removed from the holiness and sublimity of the doctrine, which pious *Cristians* have deduced from texts in the Gospel, though other *Cristians*, as pious, openly profess their dissent from them. Each sect must be justified by its own faith and good intentions. This only I mean to inculcate, that the tenet of our Church cannot, without profaneness, be compared with that of the *Hindus*, which has only an apparent resemblance to it, but a very different meaning. One singular fact, however, must not be suffered to pass unnoticed. That the name of CRISHNA, and the general outline of his story, were long anterior to the birth of our Saviour, and probably to the time of HOMER we know very certainly; yet the celebrated poem, entitled *Bhágavat*, which contains a prolix account of his life, is filled with narratives of a most extraordinary kind, but strangely variegated and intermixed with poetical decorations: the incarnate deity of the *Sanscrit* romance was cradled, as it informs us, among *herdsmen;* but it adds, that he was educated among them, and passed his youth in playing with a party of milkmaids; a tyrant at the time of his birth, ordered all new-born males to be slain, yet this wonderful babe was preserved by biting the breast, instead of sucking the poisoned nipple, of a nurse commissioned to kill him. He performed amazing, but ridiculous, miracles in his infancy, and, at the age of seven years, held up a mountain on the tip of his little finger. He saved multitudes, partly by his arms, and partly by his miraculous powers. He raised the dead, by descending for that purpose to the lowest regions. He was the meekest and best-tempered of beings, washed the feet of the *Bráhmans*, and preached very nobly, indeed, and sublimely, but always in their favour. He was pure and chaste in reality, but exhibited an appearance of excessive libertinism, and had wives or mistresses too numerous to be counted; lastly, he was benevolent and tender, yet fomented and conducted a terrible war. This motley story must induce an opinion, that the spurious Gospels, which abounded in the first age of *Christianity*, had been brought to *India*, and the wildest parts of them repeated to the *Hindus*, who ingrafted them on the old fable of CE'SAVA, the APOLLO of *Greece*.

As to the general extension of our pure faith in *Hindustán*, there are at present many sad obstacles to it. The *Muselmáns* are already a sort of heterodox *Christians*. They are *Christians*, if LOCKE reasons justly, because they firmly believe the immaculate conception, divine character, and miracles of the MESSIAH; but they are heterodox, in denying vehemently his character of Son, and his quality, as God, with the Father, of whose unity and attributes they entertain and express the most awful ideas; while they consider our doctrine as perfect blasphemy, and insist, that our copies of the Scriptures have been corrupted both by *Jews* and *Christians*. It will be inexpressibly difficult to undeceive them, and scarce possible to diminish their veneration for MOHAMMED and ALI, who were both very extraordinary men, and the second, a man of unexceptionable morals: the *Korán* shines, indeed, with a borrowed light, since most of its beauties are taken from our Scriptures; but it has great beauties, and the *Muselmáns* will not be convinced that they were borrowed. The *Hindus*, on the other hand, would readily admit the truth of the Gospel; but they contend, that it is perfectly consistent with their *Sástras*. The deity, they say, has appeared innumerable times, in many parts of this world and of all worlds, for the salvation of his

creatures; and though we adore him in one appearance, and they in others, yet we adore, they say, the same God, to whom our several worships, though different in form, are equally acceptable, if they be sincere in substance. We may assure ourselves, that neither *Muselmáns* nor *Hindus* will ever be converted by any mission from the church of *Rome*, or from any other church; and the only human mode, perhaps, of causing so great a revolution, will be to translate into *Sanscrit* and *Persian* such chapters of the Prophets, particularly of ISAIAH, as are indisputably evangelical, together with one of the gospels, and a plain prefatory discourse, containing full evidence of the very distant ages, in which the predictions themselves, and the history of the Divine Person predicted, were severally made public; and then quietly to disperse the work among the well-educated natives; with whom, if in due time, it failed of producing very salutary fruit by its natural influence, we could only lament more than ever the strength of prejudice and the weakness of unassisted reason.

X.

A DESCRIPTION OF A CAVE NEAR GYA'.

BY JOHN HERBERT HARINGTON ESQ.

A KNOWLEDGE of the antiquities of *Hindustan* forming one of the several objects proposed by the institution of our Society, with the hope of communicating something acceptable on this head, I took the opportunity of a late excursion up the country to see the *Cave* which Mr. HODGEKIS a few years since attempted to visit, at the desire, I believe, of the late Governor General, but was assassinated in his way to it by the followers of one of the rebellious allies of CHYT SING. On my describing it to the President, whom I had the pleasure to accompany, I was encouraged by him to think that a particular account of it would be curious and useful; and in consequence made a second visit to it from *Gyá*, when I took the following measurements, and, by the means of my *Moonshee*, a copy of the inscription on it, which I had despaired of presenting to you, but in its original language, (a *Pundit* at *Benáris* having attempted in vain to get it read during these last three months,) till the kind assistance of Mr. WILKINS enabled me to add the accompanying translation and remarks to what would otherwise have given little satisfaction.

The hill, or rather rock, from which the cavern is dug, lies about fourteen miles north of the ancient city of *Gyá*, and seems to be one of the south-eastern hills of the chain of mountains called by RENNEL *Caramshah*, both being a short distance to the west of the *Phulgó*.

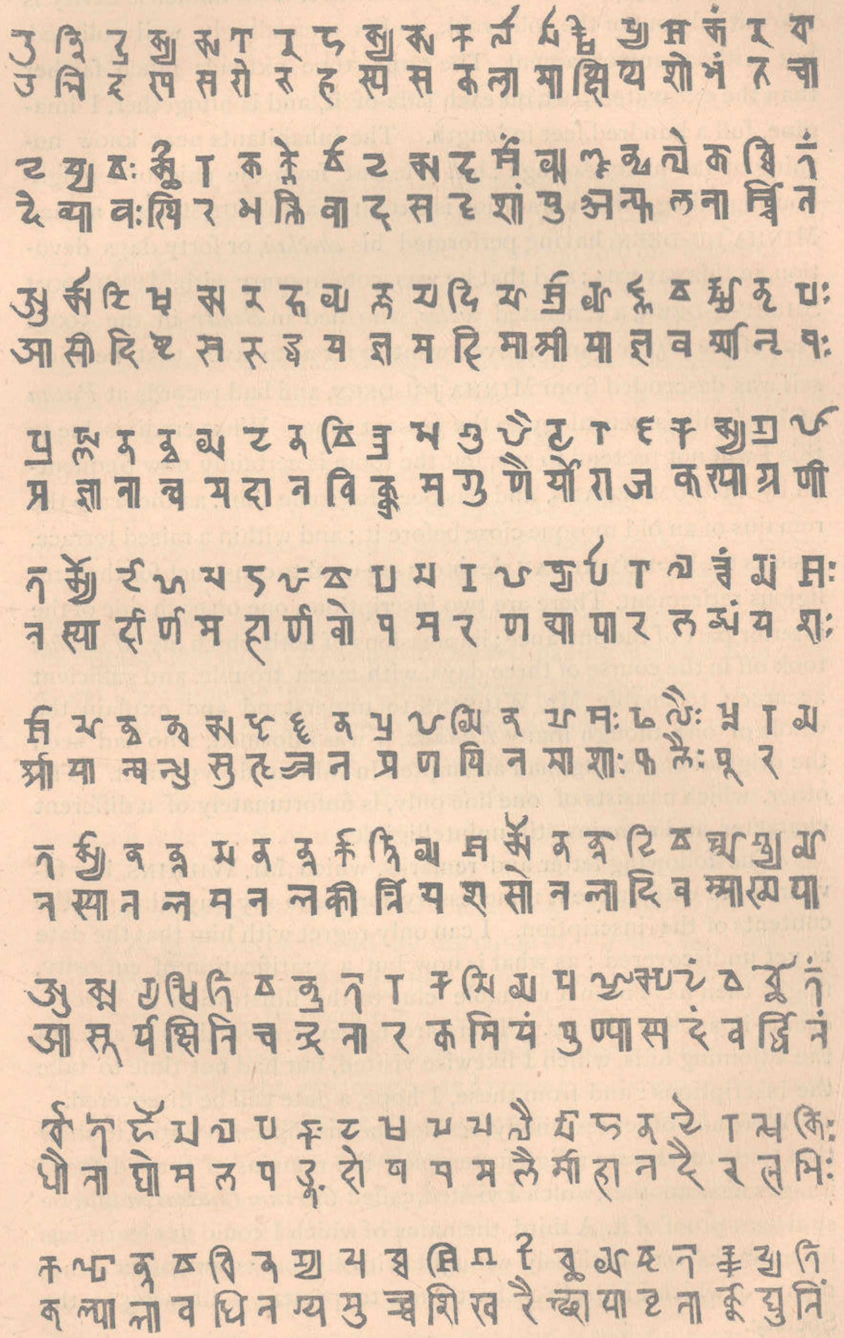
It is now distinguished by the name of *Nágurjenee;* but this may perhaps be a modern appellation; no mention of it being made in the inscription. Its texture is a kind of granite, called by the MOHUMMEDAN natives *Sung Khároh*, which composes the whole rock, of a moderate height, very craggy and uneven, and steep in its ascent.

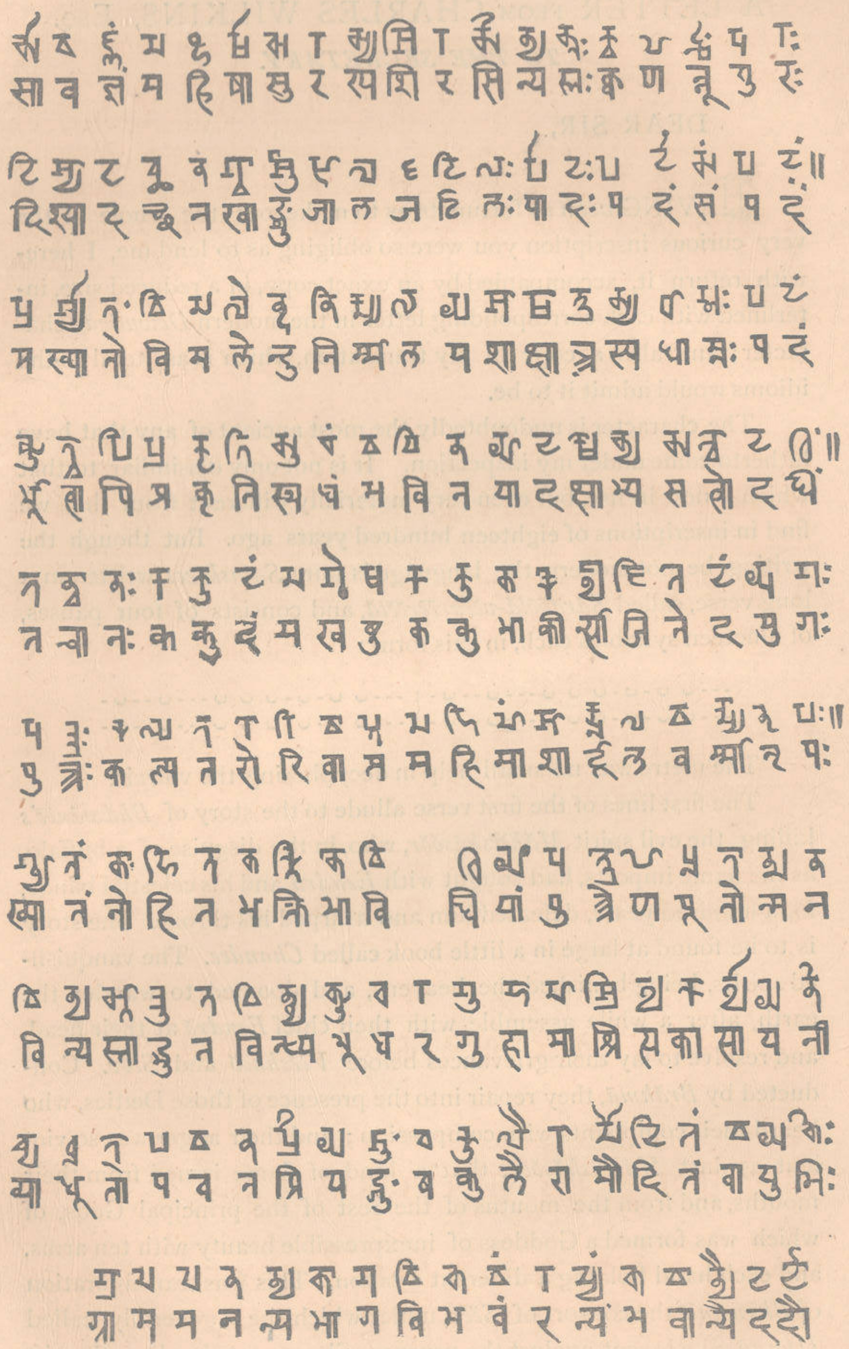
The *cave* is situated on the southern declivity, about two thirds from the summit: a tree immediately before it prevents its being seen from the bottom. It has only one narrow entrance, from the south, two feet and a half in breadth, six feet high, and of thickness exactly equal. This leads to a room of an oval form, with a vaulted roof, which I measured twice, and found to be forty-four feet in length from east to west, eighteen feet and a half in breadth, and

ten feet and a quarter in height at the centre. This immense cavity is dug entirely out of the solid rock, and is exceedingly well polished, but without any ornament. The same stone extends much farther than the excavated part, on each side of it, and is altogether, I imagine, full a hundred feet in length. The inhabitants near know nothing of its history or age; but I learnt from the chief of a neighbouring village, that a tradition is extant of a MOHUMMEDAN, named MINHA'J-U-DEEN, having performed his *cheelah*, or forty days devotion, in this caverns; and that he was cotemporary with MUKHDOOM SHERF-U-DEEN, a venerated *welee*, who died in *Behár* in the 590th year of the *Hijree;* and he even went so far as to aver that he himself was descended from MINHA'J-U-DEEN, and had records at *Patna* of his family's genealogy to the present time. What credit is due to this I will not pretend to say, but the room is certainly now frequented by MOHUMMEDANS, and has been for some time, as there are the remains of an old mosque close before it; and within a raised terrace, such as the MOHUMMEDAN, devotees are used to construct for their religious retirement. There are two inscriptions, one on each side of the interior part of the entrance; impressions of both which my *Moonshee* took off in the course of three days, with much trouble, and sufficient accuracy to enable Mr. WILKINS to understand and explain the whole of one, though many *Pundits*, I was informed, who had seen the original engraving, had attempted in vain to decypher it. The other, which consists of one line only, is unfortunately of a different character, and remains still unintelligible.

The following letter and remarks, which Mr. WILKINS has favoured me with, make it unnecessary for me to say anything of the contents of the inscription. I can only regret with him that the date is yet undiscovered; as what is now but a gratification of curiosity, might then have been a valuable clue to the illustration of obscure events in ancient history. There are, however, several other *caves* in the adjoining hills, which I likewise visited, but had not time to take the inscriptions: and from these, I hope, a date will be discovered.

Were any other testimony, besides the inscription, wanted, to shew that these *caves* were religious temples, the remains of three defaced images near another, which I visited, called *Curram Chossar*, would be sufficient proof of it. A third, the name of which I could not learn, has its entrance very curiously wrought with elephants and other ornaments, of which I hope in a short time to present a drawing to the Society.





A LETTER FROM CHARLES WILKINS, Esq.

TO THE SECRETARY.

DEAR SIR,

HAVING been so fortunate as to make out the whole of the very curious inscription you were so obliging as to lend me, I herewith return it, accompanied by an exact copy, in a reduced size, interlined with each corresponding letter in the modern *Dēwnăgăr* character; and also a copy of my translation, which is as literal as the idioms would admit it to be.

The character is undoubtedly the most ancient of any that have hitherto come under my inspection. It is not only dissimilar to that which is now in use, but even very materially different from that we find in inscriptions of eighteen hundred years ago. But though the writing be not modern, the language is pure *Samskreet*, written in a long verse, called *Sārdōōlă-vĕĕkrēērĕĕtă*, and consists of four pauses, of nineteen syllables each, in this form :

- - - ᴗ ᴗ - ᴗ - ᴗ ᴗ ᴗ - - - ᴗ - - ᴗ - 1 - - - ᴗ ᴗ - ᴗ - ᴗ ᴗ ᴗ - - - ᴗ - - ᴗ -
- - - ᴗ ᴗ - ᴗ - ᴗ ᴗ ᴗ - - - ᴗ - - ᴗ - 1 - - - ᴗ ᴗ - ᴗ - ᴗ ᴗ ᴗ - - - ᴗ - - ᴗ -

The metre was no small help in decyphering the vowels.

The first lines of the first verse allude to the story of *Bhăwānēē's* killing the evil spirit *Măhēēshăsōōr*, who, in the disguise of a buffalo, as the name imports, had sought with *Eendră*, and his celestial bands, for a hundred years, defeated him and usurped his throne. The story is to be found at large in a little book called *Chandee.* The vanquished spirits, being banished the heavens, and doomed to wander the earth, after a while assemble, with their chief *Eendră* at their head, and resolve to lay their grievances before *Vēēshnōō* and *Sēēv.* Conducted by *Brăhmā*, they repair into the presence of those Deities, who heard their complaints with compassion ; and their anger was so violent against *Măhēēshăsōōr*, that a kind of flame issued from their mouths, and from the mouths of the rest of the principal Gods, of which was formed a Goddess of inexpressible beauty with ten arms, and each hand holding a different weapon. This was transfiguration of *Bhăwānēē* the consort of *Sēēv*, under which she is generally called *Dōōrgā.* She is sent against the usurper. She mounts her lion, the gift

of the mountain *Hēēmālăy*, (snowy) and attacks the Monster, who shifts his form repeatedly ; till at length the goddess *planteth her foot upon his head*, and cuts it off with a single stroke of her sword. Immediately the upper part of a human body issues through the neck of the headless Buffalo and aims a stroke, which being warded off by the lion with his right paw, *Dōōrgā* puts an end to the combat, by piercing him through the heart with a spear. I have in my possession a statue of the Goddess with one foot on her lion, and the other on the Monster, in the attitude here lastly described.

The want of a date disappointed my expectations. I had some hopes that it was contained in the single line, which you informed me was taken from another part of the *cave ;* but, although I have not yet succeeded in making out the whole, I have discovered enough to convince me that it contains nothing but an invocation. If you should be so fortunate as to obtain correct copies of the rest of the inscriptions that are to be found in the *caves* of those mountains, I make no doubt but that we shall meet with some circumstance or other that will guide us to a discovery of their antiquity.

I have the pleasure to subscribe myself,

DEAR SIR,

Your very sincere Friend,

And obedient humble Servant,

CHARLES WILKINS.

Calcutta, 17th March, 1785.

A TRANSLATION OF A SANSCRIT INSCRIPTION.

WHEN the foot of the Goddess *(a,)* was, with its tinkling ornaments, planted upon the head of *Măhēēshăsŏŏr*, *(b,)* all the bloom of the new-blown flower of the fountain *(c,)* was dispersed, with disgrace, by its superior beauty. May that foot, radiant with a fringe of refulgent beams issuing from its pure bright nails, endue you with a steady and an unexampled devotion, offered up with fruits, and shew you the way to dignity and wealth!

The illustrious *Yăgnă Vărmā* was a prince whose greatness consisted in free-will offerings. His reputation was as unsullied as the Moon. He was renowned amongst the Martial Tribes; and, although he was, by descent, by wisdom, courage, charity and other qualities, the fore-leader of the royal line; yet, from the natural humility of his temper, he disturbed not the powerful ocean.

His auspicious son, *Sārdōōlă Vărmā*, a prince whose magnificence flowed, as it were, from the tree of imagination, *(d,)* displayed the ensign of royalty in sacrifices, and the world was subdued by his infinite renown. He gratified the hopes of relations, friends, and dependants; and honour was achieved from the deed of death *(e,)* near the uprising ocean.

By his pious son, called *Ănăntă Vărmā* because of his infinite renown, the holy abode of us contemplative men, who are always studious for his good, and employed in his service, hath been increased, and rendered famous, as long as the earth, the sun, and moon, and starry heaven, shall endure; and *Kătyāyănēē (f,)* having taken sanctuary, and being placed, in this cavern of the wonderful *Veen'dyă (g,)* mountains.

The holy prince gave unto *Bhăwānēē*, in perpetuity, the village ——— *(h,)* and its hilly lands, by whose lofty mountain-tops the sunny beams are cast in shade: Its filth and impurities are washed away by the precious stores of the *Măhānădă (i,)* and it is refreshed by the breezes from the waving *Prēēyăngŏŏs (k,)* and *Băkŏŏlăs (l,)* of its groves.

(a,) *Bhăwānēē*, the wife of *Seev*.
(b,) The name of an evil spirit.
(c,) Epithet of the lotus
(d,) In the original *Kălpă-tărŏŏ*, a fabulous tree which yielded every thing that was demanded.
(e,) He was probably carried to *Găngā-Sāgăr* to die.
(f,) One of the names of *Dŏŏrgā* or *Bŏwănēē*.
(g,) The name of the chain of mountains which commences at *Chunar*.
(h,) The name, which consisted of two long syllables, is wanting in the original.
(i,) Probably the river called the *Mahonab* in RENNEL's Map of South *Bahar*.
(k,) Probably the *Champa*.
(l,) *Moulseree*.

XI.

TRANSLATION OF A SANSCRIT INSCRIPTION,

COPIED FROM A STONE AT BŎŎD-DHĂ-GĂ YĂ,

By Mr. WILMOT, 1785.

TRANSLATED BY CHARLES WILKINS, Esq.

IN the midst of a wild and dreadful forest, flourishing with trees of sweet-scented flowers, and abounding in fruits and roots; infested with Lions and Tigers; destitute of human Society, and frequented by the *Moonees*, resided *Bŏŏd-dha* the Author of Happiness, and a portion of *Narayan*. This Deity *Hăree*, who is the Lord *Hăreesa*, the possessor of all, appeared in this ocean of natural beings at the close of the *Devāpără*, and beginning of the *Kălee Yoog*: he who is omnipresent and everlastingly to be contemplated, the Supreme Being the Eternal one, the Divinity worthy to be adored by the most praise-worthy of mankind appeared here with a portion of his divine nature.

Once upon a time the illustrious *Ămără*, renowned amongst men, coming here, discovered the place of the Supreme Being, *Bŏŏd-dhă*, in the great forest. The wise *Ămără* endeavoured to render the God *Bŏŏd-dhă* propitious by superior service; and he remained in the forest for the space of twelve years, feeding upon roots and fruits, and sleeping upon the bare earth; and he performed the vow of a *Moonee*, and was without transgression. He performed acts of severe mortification, for he was a man of infinite resolution, with a compassionate heart. One night he had a vision, and heard a voice, saying, "Name whatever boon thou wantest." *Ămără Dĕvă*, having heard this, was astonished, and with due reverence replied, "First, give me a vi-"sitation, and then grant me such a boon." He had another dream in the night, and the voice said, "How can there be an apparition in the "*Kălee Yoog?* The same reward may be obtained from the sight of "an image, or from the worship of an image, as may be derived from "the immediate visitation of a deity." Having heard this, he caused an image of the Supreme Spirit *Bŏŏd-dhă* to be made, and he worshipped it, according to the law, with perfumes, incenses, and the like; and he thus glorified the name of that Supreme Being, the incarnation of a portion of *Veeshnoo*; "Reverence be unto thee in the form of *Bŏŏd-"dhă!* Reverence be unto the Lord of the Earth! Reverence be unto "thee, an incarnation of the Deity and the Eternal One! Reverence be 'unto thee, O God, in the form of the God of Mercy;—the dispeller of 'pain and trouble, the Lord of all things, the Deity who overcometh "the sins of the *Kălee Yoog*, the Guardian of the Universe, the Em-

"blem of mercy towards those who serve the—*ōm!* the possessor of "all things in vital form! Thou art *Brăhmā*, *Veeshnoo*, and *Māhésa!* "Thou art Lord of the Universe! Thou art, under the proper form of all "things moveable and immoveable, the possessor of the whole! and "thus I adore thee. Reverence be unto the bestower of salvation, and, "*Resheekésă*, the ruler of the faculties! Reverence be unto thee *(Késă-"vă)* the Destroyer of the Evil Spirit *Késee!* O, *Dāmōrdără*, shew me "favour! Thou art he who resteth upon the face of the milky ocean, "and who lyeth upon the serpent *Sésă!* Thou art *Trĕĕvičkrămă*, (who "at three strides encompassed the Earth!) I adore thee, who art "celebrated by a thousand names, and under various forms in the shape "of *Bŏŏd-dhă* the God of Mercy! Be propitious, O Most High God!"

Having thus worshipped the guardian of mankind, he became like one of the just. He joyfully caused a holy temple to be built, of a wonderful construction, and therein were set up the divine foot of *Veeshnoo*, for ever purifier of the sins of mankind, the images of the *Pāndŏŏs*, and of the descents of *Veeshnoo*, and in like manner of *Bră-māh*, and the rest of the divinities.

This place is renowned; and it is celebrated by the name of *Bŏŏd-dhă Gāyă*. The forefathers of him who shall perform the ceremony of the *Sradha* at this place shall obtain salvation. The great virtue of the *Sradha* performed here, is to be found in the book called *Vāyŏŏ-pŏŏrānă;* an epitome of which hath by me been engraved upon stone.

Vĕĕkrămādĕĕtyă was certainly a king renowned in the world. So in his court there were nine learned men, celebrated under the epithet of the *Năvă-ratnānĕĕ* or nine jewels; one of whom was *Ămără Dévā* who was the king's chief counsellor, a man of great genius and profound learning, and the greatest favourite of his prince. He, it certainly was, who built the holy temple which destroyeth sin, in a place in *Jamboodweep*, where, the mind being steady, it obtains its wishes, and in a place where it may obtain salvation, reputation, and enjoyment, even in the country of *Bhărată*, and the province of *Kĕĕkătă*, where the place of *Bŏŏd-dhă*, purifyer of the sinful, is renowned. A crime of an hundred fold shall undoubtedly be expiated from a sight thereof, of a thousand fold from a touch thereof, and of a hundred thousand fold from worshipping thereof. But where is the use of saying so much of the great virtues of this place? Even the hosts of heaven worship with joyful service both day and night.

That it may be known to learned men, that he verily erected the house of *Bŏŏd-dhă*, I have recorded, upon a stone, the authority of the place, as a self-evident testimony, on Friday, the fourth day of the new moon, in the month of *Madhoo*, when in the seventh or mansion of *Ganisă*, and in the year of the *Era* of *Vĕĕkrămādĕĕtyă* 1005.

XII.

To

SECRETARY TO THE ASIATIC SOCIETY.

SIR,

BEFORE I left *Calcutta*, a gentleman, with whom I chanced to be discoursing of that sect of people who are distinguished from the worshippers of *Brăhm*, and the followers of MAHOMMED by the appellation *Seek*, informed me that there was a considerable number of them settled in the city of *Patna*, where they had a college for teaching the tenets of their philosophy. As *Patna* was in my way to *Banaris*, I no sooner arrived there than I inquired after the college, and I was presently conducted to it; and I now request you will please to lay before the society the few observations and inquiries which a single visit of about two hours would admit of my making. If, such as they are, they should hereafter be found useful, either as a clew to guide another in his researches in the same path, or to add to some future account to render it more complete, my end in troubling you to lay it before the society is fully answered.

I have the honour to subscribe myself,

SIR,

Your most obedient humble servant,

CHARLES WILKINS.

Banaris, 1st *March*, 1781.

OBSERVATIONS on the SEEKS and their COLLEGE.

I FOUND the College of the *Seeks* situated in one of the narrow streets of *Patna*, at no very considerable distance from the Custom-house. I was permitted to enter the outward gate; but as soon as I came to the steps which led up into the Chapel, or public hall, I was civilly accosted by two of the Society. I asked them if I might ascend into the hall. They said it was a place of worship open to me and to all men; but, at the same time, intimated that I must take off my shoes. As I consider this ceremony in the same light as uncovering my head upon entering any of our temples dedicated to the Deity, I did not hesitate to comply, and I was then politely conducted into the hall, and seated upon a carpet, in the midst of the assembly, which was so numerous as almost to fill the room. The whole building forms a square of about forty feet, raised from the ground about six or eight steps. The hall is in the centre, divided from four other apartments by wooden arches, upon pillars of the same materials, all neatly carved. This room is rather longer than it is broad. The floor was covered with a neat carpet, and furnished with six or seven low desks, on which stood as many of the books of their law; and the walls, above the arches, were hung with European looking-glasses in gold frames, and pictures of *Mussulman* Princes and *Hindu* Deities. A little room, which, as you enter, is situated at the left-hand end of the hall, is the chancel, and is furnished with an altar covered with a cloth of gold, upon which was laid a round black shield over a long broad sword, and on either side a *chowry* of peacock's feathers, mounted in a silver handle. The altar was raised a little above the ground, in a declining position. Before it stood a low kind of throne plated with silver; but rather too small to be useful: about it were several silver flower-pots and rose-water bottles; and on the left hand stood three small *urns*, which appeared to be copper, furnished with notches to receive the donations of the charitable. There stood also near the altar, on a low desk, a great book, of a folio size, from which some portions are daily read in their divine service. It was covered over with a blue mantle, on which were printed, in silver letters, some select passages of their law.

After I had had a long conversation with two of the congregation, who had politely seated themselves, on each side of me, on the

carpet, and whom I found very intelligent, notice was given, that it was noon and the hour of divine service. The congregation arranged themselves upon the carpet, on each side of the hall, so as to leave a space before the altar from end to end. The great book, desk, and all, was brought, with some little ceremony from the altar, and placed at the opposite extremity of the hall. An old man, with a reverend silver beard, kneeled down before the desk with his face towards the altar; and on one side of him sat a man with a small drum, and two or three with cymbals. The book was now opened, and the old man began to chant to the time of the drum and the cymbals; and, at the conclusion of every verse, most of the congregation joined chorus in a response, with countenances exhibiting great marks of joy. Their tones were by no means harsh; the time was quick; and I learnt that the subject was a Hymn in praise of the unity, the omnipresence, and the omnipotence, of the Deity. I was singularly delighted with the gestures of the old man: I never saw a countenance so expressive of infelt joy, whilst he turned about from one to another, as it were, bespeaking their assents to those truths which his very soul seemed to be engaged in chanting forth. The Hymn being concluded, which consisted of about twenty verses, the whole congregation got up, and presented their faces with joined hands towards the altar, in the attitude of prayer. A young man now stood forth; and, with a loud voice and distinct accent, solemnly pronounced a long prayer, or kind of liturgy, at certain periods of which all the people joined in a general response, saying *Wā Gooroo!* They prayed against temptation; for grace to do good; for the general good of mankind; and a particular blessing to the *Seeks;* and for the safety of those who at that time were on their travels. This prayer was followed by a short blessing from the old man, and an invitation to the assembly to partake of a friendly feast. The book was then closed and restored to its place at the altar, and the people being seated as before, two men entered bearing a large iron caldron, called a *curray*, just taken from the fire, and placed it in the centre of the hall upon a low stool. These were followed by others with five or six dishes, some of which were of silver, and a large pile of leaves sewed together with fibres, in the form of plates. One of these plates was given to each of the company without distinction; and the dishes being filled from the caldron, their contents were served out till every one had got his share. Myself was not forgotten; and, as I was resolved not to give them the smallest occasion for offence, I ate up my portion. It was a kind of sweetmeat, of the consistence of soft brown sugar, composed of flower and sugar mixed up with clarified butter, which is called *ghee*. Had not the *ghee* been rancid, I should have relished it better. We were next served with a few sugar plums: and here ended the feast and the ceremonies of the day. They told me the religious part of the ceremony was daily repeated five times. I now took my leave, inviting some of the principal men amongst them, who were about to return to their own country through *Banaris*, to pay me a visit.

In the course of the conversation I was engaged in with the two *Seeks* before the service, I was able to gather the following circumstances. That the founder of their faith was called *Nāneek Sah*, who flourished about four hundred years ago at *Punjab*, and, who, before his apostasy, was a *Hindoo* of the *Kshétry*, or military tribe; and that his body disappeared as the *Hindoos* and the *Mussulmans* were disputing for it; for upon their removing the cloth which covered it, it was gone; that he left behind him a book, composed by himself, in verse, and the language of *Punjab* (but a character partly of his own invention;) which teaches the doctrines of the faith he had established. That they call this character, in honor of their founder, *Gooroo-Mookhee*: "*from the mouth of the preceptor*; that this book, of which that standing near the altar, and several others in the hall, were copies, teaches that there is but one God, omnipotent and omnipresent; filling all space, and pervading all matter; and that he is to be worshipped and invoked. That there will be a day of retribution, when virtue will be rewarded and vice punished; (I forgot to ask in what manner.) That it not only commands universal toleration, but forbids disputes with those of another persuasion. That it forbids murder, theft, and such other deeds as are, by the majority of mankind, esteemed crimes against society; and inculcates the practice of all the virtues, but particularly an universal philanthropy, and a general hospitality to strangers and travellers. This is all my short visit would permit me to learn of this book. It is a folio volume, containing about four or five hundred pages.

They told me further, that some years after this book of *Nāneek Sah* had been promulgated, another made its appearance, now held in almost as much esteem as the former. The name of the author has escaped my memory; but they favored me with an extract from the book itself in praise of the Deity. The passage had struck my ear on my first entering the hall, when the students were all engaged in reading. From the similarity of the language to the *Hindovee*, and many *Sanscrit* words, I was able to understand a good deal of it; and I hope, at some future period, to have the honor of laying a translation of it before the Society. They told me I might have copies of both their books, if I would be at the expense of transcribing them.

I next inquired why they were called *Seeks*, and they told me it was a word borrowed from one of the commandments of their founder, which signifies "*Learn thou*;" and that it was adopted to distinguish the sect soon after he disappeared. The word, as is well known, has the same import in the *Hindovee*.

I asked them what were the ceremonies used in admitting a proselyte. A person having shewn a sincere inclination to renounce his former opinions, to any five or more *Seeks* assembled together, in any place, as well on the highway as in a house of worship, they send to the first shop where sweetmeats are sold, and procure a small quantity of a particular sort, which is very common, and, as I recollect, they call *Batāsā*; and having diluted it in pure water, they sprinkle some of it on the body, and into the eyes of the convert; whilst one of the best instructed repeats to him, in any language with which he is conversant, the chief canons of their faith, exacting from him a solemn promise to abide by them the rest of his life. This is the whole of the ceremony. The new convert may then choose a *Gooroo*, or preceptor, to teach him the language of their scriptures, who first gives him the alphabet to learn, and so leads him on, by slow degrees, until he wants no further instruction. They offered to admit me into their Society, but I declined the honor; contenting myself with the alphabet, which they told me to guard as the apple of my eye, as it was a sacred character. I find it differs but little from the *Dewnagur*: The number, order, and powers, of the letters are exactly the same. The language itself is a mixture of *Persian*, *Arabic*, and some *Sanscrit*, grafted upon the provincial dialect of *Punjab*, which is a kind of *Hindovee*, or, as it is vulgarly called by us, *Moors*.

XIII.

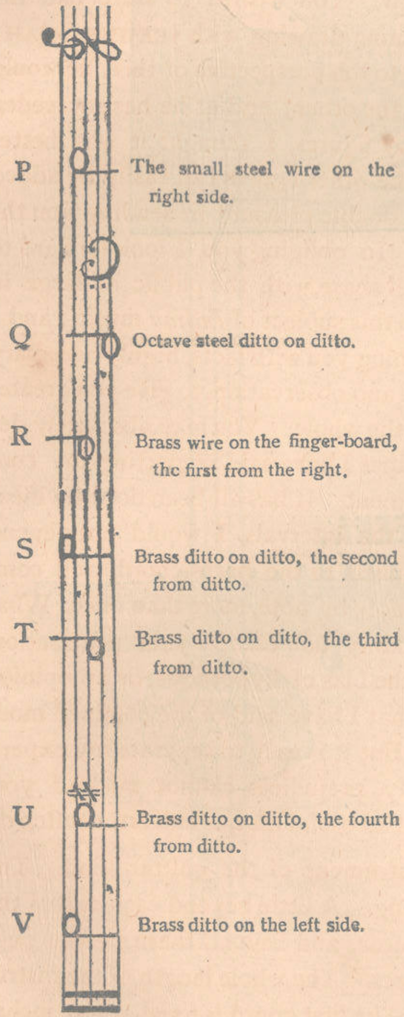
An EXTRACT of a LETTER from FRANCIS FOWKE, Esq.

TO THE PRESIDENT.

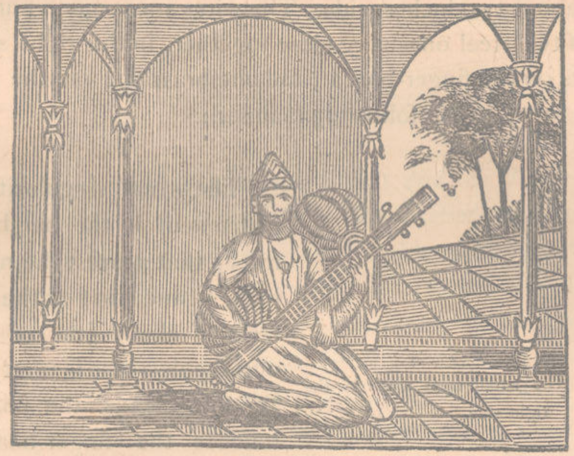
THE drawings of JEEWUN SHAH and the *Been*, will be dispatched in a small boat to-morrow. You wished to have had the two attendant musicians in the same drawing with JEEWUN SHAH; but the draftsman was not equal to the perspective of this: he would have run all the figures one into the other: and as he has succeeded tolerably well with the principal figures, I thought it was better to be sure of that, especially as the other figures can easily be added by an *European* artist. I have a double pleasure in sending you the enclosed account of the *Been*. In obliging you, I look forward to the instructive amusement I shall share with the public at large in the result of your researches into this subject of *Indian* music; and I an exceedingly happy, by furnishing you with facts, highly necessary indeed, but the mere work of care and observation, to give you greater leisure for the contemplation of the whole. You may absolutely depend upon the accuracy of all that I have said respecting the construction and scale of this instrument. It has all been done by measurement: and with regard to the intervals, I would not depend upon my ear, but had the *Been* tuned to the harpsichord, and compared the instrument carefully, note by note, more than once. What I myself am aware of, will certainly not escape your penetration, that there may be a little of the bias of hypothesis, or an opinion pretty strongly established, in what I have said of the confined modulation of the *Indian* music. But it is easy to separate my experiments and conjectures; and my prejudices cannot mislead you, though they may possibly suggest an useful hint, as half errors often do.

THE *Been* is a fretted instrument of the guittar kind. The finger-board is $21\frac{6}{8}$ths inches long. A little beyond each end of the finger-board are two large gourds, and beyond these are the pegs and tail piece which hold the wires. The whole length of the instrument is three feet seven inches. The first gourd is fixed at ten inches

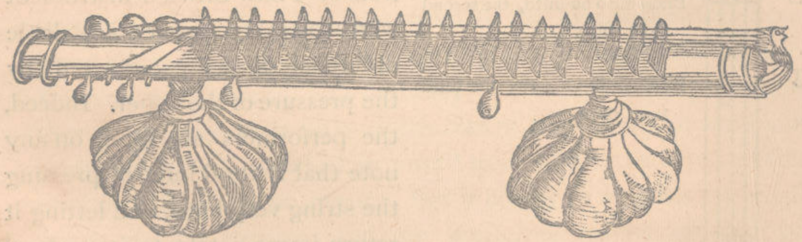
from the top, and the second at about two feet $11\frac{1}{2}$. The gourds are very large, about fourteen inches diameter, and have a round piece cut out of the bottom, about five inches in diameter. The finger-board is about two inches wide. The wires are seven in number, and consist of two steel ones very close together, in the right side; four brass ones on the finger-board; and one brass one on the left side. They are tuned in the following manner:



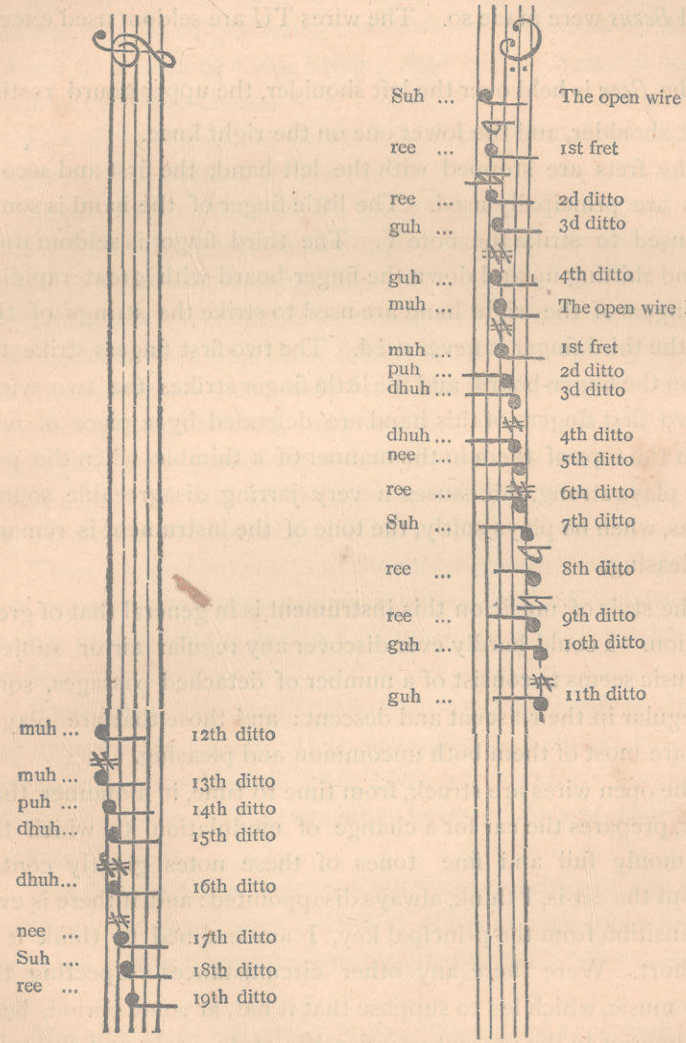
The great singularity of this instrument is the height of the frets; that nearest the nut is one inch $\frac{1}{8}$, and that at the other extremity about $\frac{3}{8}$ths of an inch, and the decrease is pretty gradual. By this means the finger never touches the finger-board itself. The frets are fixed on with wax by the performer himself, which he does entirely by ear. This was asserted by PEAR CAWN, the brother of JEEWUN SHAH, who was ill at the time; but PEAR CAWN is a performer very little, if at all, inferior to JEEWUN SHAH. The frets of PEAR CAWN'S instrument were tolerably exact: any little difference is easily corrected by the pressure of the finger. Indeed, the performers are fond, on any note that is at all long, of pressing the string very hard, and letting it return immediately to its natural tension, which produces a sound something like the close shake on the violin; but not with so agreeable an effect, for it appears sometimes to alter the sound half a tone.



THE VEENA'.



The frets are nineteen in number. The notes that they give will appear on the following scale. I have added below the names which the performer himself gives to the notes in his own language. It is very observable, that the semitones change their names on the same semitone as in the *European* scale.



On the wires R and S, which are those principally used, there is an extent of two octaves, a whole note with all the half notes, complete in the first octave, but the g♮ and b♭ wanting in the second. The performer's apology for this was, that he could easily get those notes by pressing the string a little hard upon the frets f♯ and a♮, which is very true from the height of the frets; but he asserted that this was no defect in his particular instrument, but that all *Beens* were made so. The wires TU are seldom used except open.

The *Been* is held over the left shoulder, the upper gourd resting on that shoulder, and the lower one on the right knee.

The frets are stopped with the left hand, the first and second fingers are principally used. The little finger of the hand is sometimes used to strike the note V. The third finger is seldom used, the hand shifting up and down the finger-board with great rapidity. The fingers of the right hand are used to strike the strings of this hand; the third finger is never used. The two first fingers strike the wires on the finger-board, and the little finger strikes the two wires. The two first fingers of this hand are defended by a piece of wire put on the tops of them in the manner of a thimble when the performer plays strong, this causes a very jarring disagreeable sound; whereas, when he plays softly, the tone of the instrument is remarkably pleasing.

The style of music on this instrument is in general that of great execution. I could hardly ever discover any regular air or subject. The music seems to consist of a number of detached passages, some very regular in their ascent and descent: and those that are played softly, are most of them both uncommon and pleasing.

The open wires are struck, from time to time, in a manner that, I think, prepares the ear for a change of modulation, to which the uncommonly full and fine tones of these notes greatly contribute; but the ear is, I think, always disappointed: and, if there is ever any transition from the principal key, I am inclined to think it is very short. Were there any other circumstances respecting the *Indian* music, which led to suppose that it has, at some period, been much superior to the present practice, the style, scale, and antiquity of this instrument, would, I think, greatly confirm the supposition.

XIV.

A DESCRIPTION OF THE MA'HWAH TREE.

By LIEUTENANT CHARLES HAMILTON.

THERE is a very curious and useful tree called by the Natives of *Bahar*, and the neighbouring countries, the *Máhwah* or *Máwee;* its name, as written by them, being; مهوه but the *Sanscrit* name is *Madhúca* or *Madhudruma.*

It is of the class of the Polyandria Monogynia, of Linnæus, but of a genus not described by him.

The calyx is monophyllous, quadrifid, half divided, and imbricated in its divided part; the two opposite and *outer* covering, in part, the two opposite and *inner*, parts.

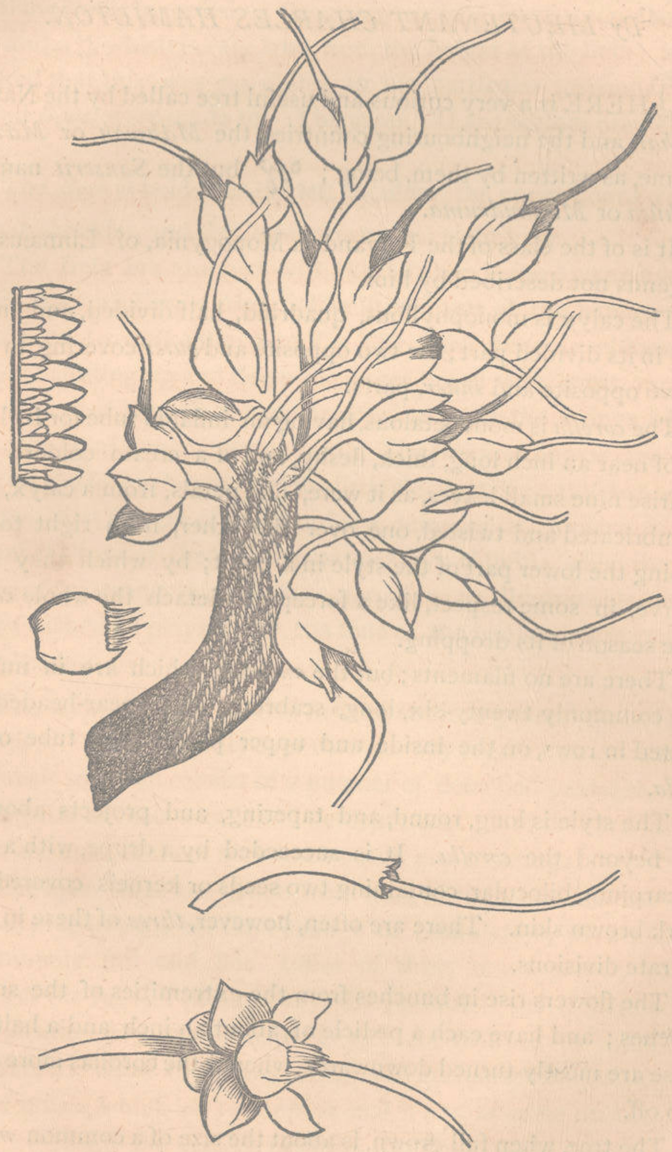
The *corolla* is monopetalous, having an inflated tube for its lower part of near an inch long, thick, fleshy, and of a cream colour: from this arise nine small leaves, as it were, like petals, from a calyx, that are imbricated and twisted, one over the other, from right to left, clasping the lower part of the style in a point; by which they seem to serve, in some respect, like a forceps, to detach the whole *corolla* at the season of its dropping.

There are no filaments; but the *antheræ*, which are in number most commonly twenty-six, long, scabrous, and spear-headed, are inserted in rows, on the inside and upper part of the tube of the *corolla.*

The style is long, round, and tapering, and projects about an inch beyond the *corolla.* It is succeeded by a drupe, with a thick pericarpium, bilocular, containing two seeds or kernels covered with a dark brown skin. There are often, however, *three* of these in three separate divisions.

The flowers rise in bunches from the extremities of the smaller branches; and have each a pedicle of about an inch and a half long. These are mostly turned downwards, whence the corollas more easily drop off.

The tree, when full grown, is about the size of a common *mango-tree*, with a bushy head, and oval leaves, a little pointed. Its roots



spreading horizontally, are sunk but little in the earth. The trunk, which is often of a considerable thickness, rises seldom to any great height, without giving off branches; it is, however, not uncommon to see it shoot up clear to the length of eight or ten feet. The wood itself is moderately hard, fine grained, and of a reddish colour.

By incision, the tree affords a resinous *gum* from the bark.

The flowers are of a nature very extraordinary, differing essentially from those of any other plant with which I am acquainted, as they have not, in any respect the usual appearance of such, but rather resemble *berries*, and I, like many others, had long conceived them to be the *fruit* of the *Mahwah*. The tree drops its leaves in the month of February; and early in March these flowers begin to come out in clusters of thirty, forty, or fifty, from the extremity of every small branch; and, from this period till the latter end of April, as the flowers come to maturity, (for they never open or expand), they continue falling off, with their *antheræ*, in the mornings, a little after sunrise, when they are gathered; and afterwards dried by an exposure of a few days in the sun: when thus prepared, they very much resemble a dried *grape*, both in taste and flavour.

Immediately after the flowers drop off fresh shoots are made for the new leaves, which soon make their appearance; coming presently to their full growth.

The fruit *(properly* so called) is of two sorts in shape; the one resembling a small *walnut;* the other somewhat larger, and pointed. It is ripe towards the middle of May, and continues dropping from the tree till the whole fall; which is generally about the beginning or towards the middle of June. The outer covering, or *Pericarpium*, which is of a soft texture, commonly bursts in the fall, so that the seeds are very easily squeezed out of it. The seeds are somewhat of the shape, but longer than an *olive*.

These seeds are replete with a thick *oil*, of the consistence of *butter* or *ghee*, which is obtained by expression.

From this description it may easily be conceived that the *Mahwah tree*, and its productions, are of singular and general use, especially in those dry and barren countries which, from the nature of their situation, are not so well calculated for producing in plenty or perfection the other necessaries of life.

The *corolla*, or flowers, after being dried as before described, are eaten by the natives raw, or dressed with their *curries* ; and, when even simply boilded with rice, they afford a strengthening and wholesome nourishment. They are, indeed, often applied to a less laudable purpose ; for being fermented, they yield, by distillation, a strong spirit, which the people here sell so very cheap, that, for *one pice*, (about a half-penny), may be purchased no less than a *cutcha-seer*, (above a pint *English)*, with which any man may get completely drunk. These flowers make an article of trade ; being exported from this country to *Patna*, and elsewhere, in no inconsiderable quantities.

The *oil* yielded by the fruit, as before mentioned, resembles *ghee* so much, that, being cheaper, the natives often mix it with that commodity. They use it, the same as *ghee*, in their victuals, and in the composition of some sorts of sweetmeats ; and burn it in their lamps. It is also regarded as a salutary remedy, applied exteriorly, to wounds, and all cutaneous eruptions. It is, at first, of the consistence of common *oil*, but soon coagulates. After being kept for some time, it acquires a bitterish taste and rancid smell, which renders it somewhat less agreeable as an article of food : but this is an inconvenience which, by the *oil* being properly clarified, and prepared at first, might be perhaps avoided. This *oil* is also exported, both in its adulterated and original state, to *Patna*, and other parts of the low country.

I do not know any purpose to which the *gum* has ever been applied ; but if found, upon trial, to be of use, it might be collected in large quantities. The best season for this would be in the months of March and April, about the time the flowers come out, when the tree seems to be most replete with it. Such an operation, indeed, would probably diminish its produce in the fruit and flower ; but where it was sufficiently cultivated, the loss in those could be but little felt.

The wood, from what has been already said of it, cannot be expected to be often had in beams of any considerable length, so as to make it so very useful in building, as it would otherwise be, from its not being liable to be eat by the white ants. Mr. KIER, however, tells me that, when he was at *Chowsee*, (a village upon the *Caramnassa*, near *Buxar)*, he had beams of it, which were, to the best of his remembrance, above twenty feet long. But, in many other respects it is a most useful wood ; and, as it is tough, and of a strong texture, it might, perhaps, be employed to advantage in ship building, in which case, if properly cultivated in many grounds that seem well adapted for it, and fit for little else, it might thus in time become a valuable article in that branch at *Calcutta*, whether it could easily be transported during the rainy season, from almost any part of these countries, by several rivers that are then sufficiently full to float it down.

The tree, I am told, will grow in the most barren ground, even amongst stones and gravel, where there is the least appearance of a soil ; and it seems to destroy all the smaller trees and brushwood about it : yet it does not refuse a *rich* soil either. Mr. KEIR having observed to me, that the few he had seen about *Buxar*, where it is certainly very good, were both taller, and seemed to thrive much better than any he had ever met with in *Ramgur*. It does not require much *moisture*, seeming to produce nearly as well in the driest as in most favourable years ; and in every situation ; and is therefore admirably fitted for the convenience of the inhabitants of these hilly countries, which are peculiarly subject to long and severe droughts during the hot months.

Yet, notwithstanding its utility, and the immense quantity of ground that seems so well adapted to the growth of it, both here, and in the neighbouring provinces of *Catak*, *Pacheet*, *Rotas*, &c. (the greatest part of which, indeed, seems fit for no other useful production, I have myself never observed, nor can I find any of my acquaintance who ever have remarked, one single tree in its infant state : we can see, every where, *full-grown* trees in great abundance ; but never meeting with any young plants, both I, and all whom I have spoken to on the subject, are at some loss to conceive how they should have come here. Neither can the country people themselves, of whom I have inquired, give any rational account of this ; although it appears pretty evident that numbers of them must have been cultivated some time or other, every village having many of them growing about it.

This is a circumstance which sufficiently marks the true character of the lower order of natives in their most supine indolence and sloth ; owing chiefly, perhaps, to the ignorant and stupid rapacity of their *Rajahs*, *Zemeendars*, and other *Landholders*, and their total inattention to the welfare of those dejected wretches, from whom they derive their consequence and power: of their base indifference to the interests of those whom they thus affect to hold beneath their regard, many striking instances occurred to me in the course of my inquiries upon this very subject; and it was not long ago that, asking some questions concerning the *Máhwah* of a *Zemeendar* in this neighbourhood, he answered, that "it was the food of the *poor* people, and how should *he* know any thing about it!"

It was this strange neglect of the culture of it, and a knowledge of its usefulness, which first led me to inquire into the nature of this tree, from which the bulk of the people hereabouts already draw such great benefit; in order to know whether they might not increase it without any great trouble to themselves; and whether thereby the revenue might not also be increased, and a certain provision be made against famines, from which the natives often suffer severely in these higher districts.

To effect this, it would be necessary to give the *ryots* every possible encouragement to raise the tree from the seeds; but as the torpid apathy of these people, whether natural or acquired, will ever prevent their being moved to any exertion by a prospect, however alluring, of *distant* advantage, I apprehend the only way of bringing this about, would be making the planting and raising of a certain number of *Máhwahs* (in proportion to the value of the tenure) an article in their *Kabooleeats*, or agreements.

The tree, as has been already observed, will grow almost any where. It ought to be sown about the beginning of the rains, either in beds (to be afterwards transplanted) or at about thirty or forty feet distance, in the ground designed for it. It is said that, in seven years, the trees will give flowers and fruit; in ten, they will yield about half their common produce; and that in twenty years they come to their full growth; after which, if my information be good, they will last near one hundred years. This account, I acknowledge, must necessarily be very vague and uncertain; as I never have met with a single person who appeared to have had either opportunity or inclination to observe its progress. Such, however, is what the country people say of it.

I am told that a good tree will easily give four *puckha maunds* (about three hundred weight avoirdupois) of dried flowers, which will sell here for about two *rupees;* and of seeds it will afford about

two *maunds;* and this, of *oil,* will yield twenty-six *seers puckha* weight (near 60lb.) which, in a year like this, when *oil* is cheap, will sell at this place for two *rupees* more. It is to be observed, however, that *every* tree will not give so much, neither are the flowers and *oil* so clear in any part of the hills as at *Chatra;* but, allowing only a *half* of this, or less, to be the product of each tree, (though it might be rendered still much greater by the very least care and industry in the cultivation of it), within the space of twenty years, a subsistence might be raised to the inhabitants, and a considerable revenue to the proprietors of the lands, throughout an immense tract of country; the greatest part of which, in its present state, is little better than a barren waste, and can not pay one single *anna* to the *Zemeendar* or the Government. That such an advantage might be derived from it, may be proved by the most moderate calculation; for, supposing the trees to be sown at forty feet distance from each other, on each *beegah* (about the third of an acre) might stand eight trees; and, supposing the product of each tree to be only *half a rupee,* there would be *four rupees* of *annual value* on a *beegah* of ground; half of which going to the proprietor; it would thus give a far better rent than the generality of the best grounds in these parts; and the labourer would have a produce, without any other trouble than that of sowing the seed; and fencing the ground whilst the trees were young; and that of annually gathering the flowers, and preparing the *oil,* when they arrive at their proper size: and they would probably begin to give a produce within less than ten years after the sowing.

As this tree will yield nearly its usual quantity of flowers and fruit in seasons when, for want of rain, every other crop fails; if thus cultivated, it would afford the inhabitants a sure and certain resource; under the most dreadful, and what has hitherto been, to them, the most destructive of all calamities, famine. It is well known that the rice, and other sorts of grain, which from the chief part of their sustenance, require a considerable degree of moisture to bring them to perfection. An unusually dry season destroys the harvest in those articles, and reduces the *ryots* in general to the utmost misery; a predicament into which they could hardly fall, even in the severest dearth of grain, whilst they had plenty of the flowers and fruit of the *Máhwah* to depend upon.

It may be here not improper to observe, that Mr. KEIR is now sowing a few acres with the seed of this useful tree, and means to fence it; which may, perhaps in time, tempt others to follow so good an example.

Chatra, Ramgur, July 6, 1785.

XV.

Of the METHOD of DISTILLING,

As practised by the NATIVES *at* CHATRA *in* RAMGUR, *and in the other Provinces, perhaps, with but little Variation.*

By ARCHIBALD KEIR, Esq.

THE body of the still they use is a common, large, unglazed, earthen water jar, nearly globular, of about twenty-five inches diameter at the widest part of it, and twenty-two inches deep to the neck, which neck rises two inches more, and is eleven inches wide in the opening. Such, at least, was the size of the one I measured; which they filled about a half with fomented *Máhwah-flowers*, that swam in the liquor to be distilled.

The jar they placed in a furnace, not the most artificial, though seemingly not ill adapted to give a great heat with but a very little fuel. This they made by digging a round hole in the ground, about twenty inches wide, and full three feet deep; cutting an opening in the front, sloping down to the bottom, on the sides perpendicular, of about nine inches wide, and fifteen long, reckoning from the circle where the jar was to come, to serve to throw in the wood at, and for a passage to the air. On the side too they cut another small opening, of about four inches by three; the jar, when placed, forming one side of it, to serve as a chimney for the smoke to go out at. The bottom of the earth was rounded up like a cup. Having then placed the jar in this, as far as it would go down, they covered it above, all round, with clay, except at the two openings, till within about a fifth of its height; when their furnace was completed.

In this way, I reckon there was a full third of the surface of the body of the still, or jar, exposed to the flame, when the fire came to be lighted; and its bottom, not reaching to within two feet of where the fuel was, left a capacious hollow between them, whence the wood, that was short and dry, when lighted, being mostly convered into flame, and circulating on so great a surface of the still, gave a much stronger heat than could else have been produced from so very little fuel; a consideration well worth the attention of a manufacturer, in our country more especially, where firing is so dear. There indeed, and particularly as coal is used, it would be better, no doubt, to have a grate; and that the air should enter from below. As to the benefit resulting from the body of the still being of earthen-ware, I am not quite so clear in it. Yet, as lighter substances are well known to transmit heat more gradually and slowly than the more solid, such as metals, may not earthen vessels, on this account, be less apt to burn their contents, so as to communicate an empyreumatic taste and smell to the liquor that is distilled, so often, and so justly complained of, with us. At any rate, in this country, where pots are made so cheap, I should think them greatly preferable, as, at least, much less expensive than those which the gentlemen engaged in this manufacture most commonly employ: though of this they are best able to judge.

Having thus made their furnace, and placed the body of the still in it, as above described, they to this luted on, with moistened clay, to its neck, at the opening, what they here call an *adkur;* forming with it, at once, a cover for the body of the still, with a suitable perforation in it to let the vapour rise through, and the under part of the alembic. The *adkur* was made with two earthen pans, having round holes in their middles, of about four inches diameter; and, their bottoms being turned opposite the one to the other, they were cemented together with clay; forming a neck of junction thus of about three inches, with the small rising on the upper pan. The lowermost of these was more shallow, and about eleven inches wide, so as to cover exactly the opening at the neck of the jar, to which they luted it on with clay. The upper and opposite of these was about four inches deep, and fourteen inches wide, with a ledge round its perforation in the middle, rising, as is already said, from the inner side of the neck, of about half an inch high, by which a gutter was formed to collect the condensed spirit as it fell down; and from this there was a hole in the pan to let it run off by; to which hole they occasionally luted on a small hollow *bamboo*, of about two feet and a half in length, to convey it to the receiver below. The upper pan had also another hole in it, of about an inch square, at near a quarter of its circumference from the one below just spoken of, that served to let off the water employed in cooling, as shall be mentioned presently.

Their *adkur* being thus fitted to the jar, they completed the alembic by taking a copper-pot, such as we use in our kitchens, of about five inches deep, eight wide at the mouth, and ten at the bottom, which was rather flattish; and turning its mouth downward, over the opening in the *adkur*, luted it down on the inside of the jar with clay.

For their cooler they raised a seat, close upon, and at the back part of, the furnace, about a foot higher than the bottom of the copper-pot. On this they placed a two or three gallon pot, with a round hole, of about half an inch in the side of it; and to this hole, before they lighted their fire, they luted on a short tube of a like bore; placing the pot, and directing its spout so as that, when filled with water, it threw a constant and uniform stream of it, from about a foot high, or near the centre of the bottom of the copper-pot, where it was diffused pretty completely over its whole surface; and the water falling down into the upper part of the pan of the *adkur*, it thence was conveyed through the square hole, already mentioned, by a trough luted on to it for that purpose, to a cooling recevoir a few feet from the furnace; from which they took it up again to supply the upper pot, as occasion required.

As their stock of water, however, in this sort of circulation, was much smaller than it seemingly ought to have been, being scarcely more than six or eight gallons, it too soon became hot; yet, in spite of this disadvantage, that so easily might have been remedied, and the shortness of the conducting tube, which had nothing but the common air to cool it, there ran a stream of liquor from the still; and but very little vapour rising from it; beyond any thing I had ever seen from stills of a much larger size, fitted with a worm and cooler. In about three hours' time, indeed, from their lighting of the fire, they drew off full fifteen bottles of spirit; which is more, by a great deal, I believe, than could have been done in our way from a still of twice the dimensions.

The conveniences of a worm and cooler, which are no small expence either, I have myself often experienced; and if these could be avoided in so simple a way, that might easily be improved, the hints that are here offered may be of some use. The thin metal head is certainly well adapted, I think, to transmit the heat to the water, which is constantly renewed; and which, if cold, as it ought to be, must absorb the fastest possible: whereas, in our way, the water

being confined in a tub, that, from the nature of its porous substance, in a great degree rather retains than lets the heats pass away, it soon accumulates in it, and becomes very hot; and though renewed pretty often, never answers the purpose of cooling the vapour in the worm so expeditiously and effectually as is done by their more simple and less expensive apparatus. In this country more specially, where labour and earthen-wares are so cheap, for as many *rupees*, and less, twenty furnaces with stills, and every thing belonging to them, independent of the copperpots, might very well be erected, that would yield above a hundred gallons of spirits a day; allowing each still to be worked only twice. So very cheap, indeed is arrack here, to the great confort of my miners, and of many thoughtless people beside, that for one single *peysa*, (not two farthings sterling), they can get a whole *cutcha-seer* of it in the *bazar*, or above a full *English* pint, and enough to make them completely intoxicated; objects often painful to be seen.

Of the superior excellence of metal in giving out heat from itself, and from vapour contained in it, we have a very clear proof, in what is daily performed on the cylinder of the steam engine: for cold water being thrown on it when loaded, the contained vapour is constantly condensed; whence, on a vacuum being thus formed, and the weight of the atmosphere acting on the surface of the piston, attached to the arm of the balance, it is made to descend, and to raise the other arm that is fixed to the pump; while this being somewhat heavier, immediately sinks again, which carries up the piston, while the cylinder is again filled: and thus alternately by cooling and filing it, is the machine kept in motion; the power exerted in raising the pump-arm being always in proportion to the diameter of the cylinder, or to the surface of the piston, which is exactly fitted to it, and on which the pressure acts.

The contrivance too, of having the under part of the alembic, where the condensed vapour is collected, or upper part of what they call the *adkur*, of earthen-ware, of so great a thickness, and of course at so great a distance from the heat in the body of the still, is well imagined to keep the spirits the coolest possible, when collected and running off.

By thus cooling and condensing the vapour, likewise, so suddenly as it rises, there is in a great measure a constant vacuum made, or as much as possible can be; but that both steam rises faster, and that water boils with much less heat, when the pressure is taken away from its surface, is an axiom in chymistry too well known to need any illustration; it boiling in vacuum, when the heat is only ninety or ninety-five by Farenheit's Thermometer, whereas in the open air, under the pressure of the atmosphere, it requires no less than that of two hundred and twelve ere it can be brought to the boiling point.

I must further observe, that the superior excellence of condensing the vapour so effectually and speedily in the alembic to our method of doing it on a worm and cooler, is greatly on the side of the former; both from the reasons I have already adduced, and because of the small stream of vapour that can be only forced into the worm, where it is condensed gradually as it descends; but above all, from the nature of vapour itself, with respect to the heat contained in it, which of late has been proved, by the very ingenious Dr. BLACK, to be greater by far than, before his discoveries, was imagined. For vapour he has shown to be in the state of a new fluid, where water is dissolved by heat; with the assistance, perhaps, if I may be allowed a conjecture, of the air which it contains: and all fluids, as he has clearly demonstrated, on their becoming such, absorb a certain quantity of heat, which becomes what he very properly calls latent heat, it being heat not appearing either to the senses or to the thermometer while they remain in that liquid state; but showing itself immediately by its effects on whatever is near it, upon their changing their form from fluid to solid; as on water becoming ice, or metals fixing and the like. In the solution of salts, also there is an absorption of heat, as we daily experience in the cooling of our liquors by dissolving salt-petre in water; and this he has found to be the case with water itself, and other fluids, when passing into a state of vapour by boiling. From the most accurate and judicious experiments, indeed, he infers, and with the greatest appearance of truth, that the heat thus concealed in vapour raised by boiling, from any given bulk of water, would be fully sufficient, if collected in a piece of iron of the like size, to make it perfectly red hot. What then must be the effect of so much heat, communicated in our way of distilling to the worm, and to the water in the tub, will be sufficiently evident from what has been said, to prove, I think, that we

have hitherto employed a worse and more defective method than we might have done with respect to cooling at least, both in the making of spirits, and in other distillations of the like kind, where a similar mode is adopted.

The poor ignorant *Indian*, indeed, while he with wonder surveys the vast apparatus of *European* distillers, in their immense large stills, worms, tubs, and expensive furnaces, and finds that spirits thus made by them are more valued, and sell much dearer than his own, may very naturally conclude, and will have his competitors join with him in opinion, that this must alone surely be owing to their better and more judicious manner of distilling with all those ingenious and expensive contrivances, which he can no wise emulate; but in this, it would appear, they are both equally mistaken; imputing the effects, which need not be controverted, perhaps, to a cause from which they by no means proceed; the superiority of their spirits, not at all arising from the superior excellence of these stills and furnaces, nor from their better mode of conducting the distillation in any respect; but chiefly rather from their greater skill and care in the right choice, and proper management, of the materials they employ in fermentation; and above all, as I apprehend, from the vast convenience they have in casks, by which, and from their abilities in point of stock, they are enabled, and do, in fact, in general, keep their spirits for a certain time, whence they are mellowed, and improved surprisingly both in taste and salubrity.

With respect to the latter improvement, I mention it more particularly here; and the more willingly also, as in general it seems to have been but too little attended to where a due attention to it might be of the greatest use. For of all things that have been found grateful to the human palate, there was none ever used, I believe, more hurtful to the body, and to the nerves especially, than fresh drawn ardent spirits; and this owing evidently to the principle of inflammability, of which, with water, they are mostly made up, being then in a more loose and detached state, less assimilated with the other principles than it afterwards becomes with time. By time, indeed, it is gradually not only more assimilated, but at length changes its nature altogether; so as to become, what was at first so pernicious, a benign, cooling liquor: when the spirit is strong, the change, it is true, goes on more slow and imperceptibly; yet as a partial alteration is only wanted to mellow it for use, a few years keeping would be sufficient to answer the purpose here: and whether or no it could be possible to prevent any other from being sold than that which had been kept a certain time, is well worth the consideration of the Legislature.

That the great noxious quality of fresh drawn spirits is chiefly owing to the cause I have assigned, a little attention, and comparing of the effects that are uniformly produced by the principle of inflammability, wherever it is met with in a loose and weakly combined state, as it is in them, will easily convince us of: whereas, when fully assimilated either in spirits, or with any other body, it becomes entirely inert, and useful, more or less, either for food or physic, according to what it happens to be united with. Thus we find it in putrid animal substances, where it lately formed part of a healthy body, being now detached, or but weakly united with air, exhibiting a most offensive and pernicious poison: though this absorbed again by a living plant, is presently changed into good and wholesome nourishment; to the vegetable immediately, and to any animal who may afterwards choose to eat it. In like manner sulphur, which is a compound of this principle alone, united to a pure acid, the most destructive to all animal and vegetable substances, yet, it being here perfectly inert also, may be taken into the body with safety; when, if loosened either by heat or by an alkaline salt uniting with the acid, its noxious quality is presently made perceivable to whoever comes within its reach.

Many other instances of a like nature might easily be added, and some too more apposite, perhaps, than those I have here mentioned; but every one's own experience, with what I have already said, will sufficiently evince the propriety and utility of putting an entire stop, if possible, to the sale of what ought to be so justly prohibited; and this, in its consequences, may even help to lead to other more effectual means of correcting, in a great measure, the cruel abuse of spirits in general, that has been long so loudly and so justly complained of, amongst the soldiers, lower *Europeans*, and our servants in this country; where the very worst, and, indeed, poisonous sort of them, is daily sold at so very cheap a rate.

All I need further add with respect to distillation, and on the

superior advantages in the mode of conducting it here, to that we have been in use to employ for the raising of spirits, simple waters, and the like, is only to observe, I have no sort of doubt but that the intelligent chymical operators at home, if ever they should get a hint of it, will make no manner of scruple to use it also, and to improve upon it greatly by a few ingenious contrivances, which their knowledge and experience will so easily suggest. The principles on which it seems founded, indeed, especially with regard to their way of cooling, are so striking and just, that in many other distillations besides those of spirits and waters, they may be employed, I apprehend, with very great profit and advantage. I shall now, however, confine myself to mention only the benefit that may result from a like process in the raising of the finer aromatics, while the heat contrived, as in our way, besides impeding the distillation, must, from its long action on such subtile bodies, probably injure them greatly in the essential quality on which their excellence depends; and upon this very account I am apt to imagine that the greater quantity obtained, and the superior quality of the *Oil* of *Roses* made in this country, to that made from *roses* with us, is owing chiefly, if not entirely, to their better and more judicious manner of extracting it here. For, with us, the still being made of metal, may, in the first instance, impart too great and too sudden a degree of heat; and next, the *oil* continuing so long in the vapour, and that much compressed, may, in so delicate a subject, not only entirely almost unite it with the water, so as to render the separation impracticable, but may at the same time alter its essence so completely, as that it can no longer appear in the state it otherwise might have been found in, had the operation been better conducted, or in the way they do here. A very few trials, however, would much better certify this than all I can possibly say on the subject, or, in fact, than all the reasoning in the world. Therefore, as to my own particular opinion of the flavour and quality of the *roses* at home being equal, if not superior, to that of those in this country, I may be entirely silent. The rules and reasoning in chymistry, though serving greatly to enlarge and improve our understanding, being what of themselves can never be depended upon till confirmed by facts and experiments; where many things often turn out very different from what, from our best and most plausible arguments, we had the greatest reason to expect. Or, if it should be found to be really true, what I have often heard asserted, by those, however, who had it only from others, but not of their own particular knowledge, that, in distilling their *Oil* of *Roses* at the places where they make it the best, they use also, with their *roses*, *sandal-wood*, and some other aromatics, no *roses* whatsoever, it is plain, could ever of themselves be made to afford a like *oil*, nor without such an addition as they employ. A circumstance, by the bye, that might possibly easily be certified by some one of the many ingenious correspondents of the Society, who may happen to reside where it is made: and a knowledge of the real truth of it would certainly be of use.

Chatra, December 24, 1786.

XVI.

A METHOD OF CALCULATING THE MOON'S PARALLAXES

IN LATITUDE AND LONGITUDE.

BY MR. REUBEN BURROW.

IN the Nautical Almanac for 1781, among other problems published by authority of the Board of Longitude, there is one for calculating the place of the Nonagesimal Degree; which is expressly recommended to Astronomers as "superior to all other methods for calculating eclipses of the Sun and occultations of the Stars." Now, as a considerable part of that method is erroneous, and particularly in south latitudes, and between the Tropics, (which include the most of *India*), the error may therefore be of consequence; and the more so, as it is published under the sanction of Dr. MASKELYNE, the Astronomer Royal. I have, therefore, taken the liberty of giving the following rule to supply its place; and, in imitation of the methods of the *Hindoos*, have endeavoured to express it so plainly, that any person may calculate by it without knowing much of the subject.

PROBLEM.

Given the apparent time at any given place; to find the longitude and altitude of the nonagesimal degree, and also the parallaxes in latitude and longitude.

1. Turn the difference of longitude from *Greenwich* into time, and add it to the apparent time, if the place be to the west of *Greenwich;* but subtract if the place be to the east, and the sum, or remainder, will be the apparent time at *Greenwich.*

2. To this time calculate the sun's right ascension in time, and add it to the apparent time at the given place; the sum is the right ascension of the meredian in time.

3. From the latitude of the place by observation, subtract the correction taken from page LXXV of MAYER'S Tables; the remainder is the latitude in the spheroid.

4. Call the right ascension of the meridian in degrees AR; and, if the right ascension of the meridian

$$\text{Be between}\left\{\begin{array}{c}\overset{\circ}{00}\text{ and }\overset{\circ}{90}\\ 90\text{ and }270\\ 270\text{ and }360\end{array}\right\}\begin{array}{l}\text{then, in}\\ \text{North}\\ \text{Latitude.}\end{array}\left\{\begin{array}{l}AR+\overset{\circ}{90}\\ 270-AR\\ AR-270\end{array}\right\}\begin{array}{l}\text{is an}\\ \text{Arc A.}\end{array}\left\{\begin{array}{l}\text{but in}\\ \text{South}\\ \text{Latitude.}\end{array}\right\}\begin{array}{l}\overset{\circ}{90}-AR\\ AR-90\\ 450-AR\end{array}\Big\{\begin{array}{l}\text{is the}\\ \text{Arc A.}\end{array}$$

5. Let half the sum of the colatitude of the place and the obliquity of the ecliptic be called C; and half their difference D; then add the secant of C, the cosine of D, and the cotangent of half A, together; the sum (rejecting twice radius) is the tangent of an arc M; then add the cosecant of C, the sine of D, and the cotangent of half A, together; the sum (rejecting twice radius) is the tangent of an arc N: then if the colatitude of the place be greater than the obliquity of the ecliptic, the sum of M and N is an angle, whose complement call B; but, if the colatitude be less than the obliquity, let the complement of the difference of M and N be called B.

6. Add the secant of B, the sine of A, and the cosine of the latitude of the place, together; the sum (rejecting twice radius) is the sine of the altitude of the nonagesimal degree.

7. Add the tangent of the latitude to the tangent of the obliquity of the ecliptic; the sum is the sine of an angle, which call X.

8. When the right ascension of the meridian is

$$\text{Between}\left\{\begin{array}{c}\overset{\circ}{360}-X\text{ and }\overset{\circ}{90}\\ 90\text{ and }180+X\\ 180+X\text{ and }270\\ 270\text{ and }360-X\end{array}\right\}\begin{array}{c}\text{in}\\ \text{N.}\\ \text{Lat.}\end{array}\left\{\text{or between}\right\}\begin{array}{l}X\text{ and }90\\ 90\text{ and }180-X\\ 180-X\text{ and }270\\ 270\text{ and }X\end{array}\left\{\begin{array}{c}\text{in}\\ \text{S.}\\ \text{Lat.}\end{array}\right\}\text{then}\left\{\begin{array}{l}B\\ 180-B\\ 180+B\\ 360-B\end{array}\right\}\begin{array}{c}\text{is the}\\ \text{Longi-}\\ \text{tude.}\end{array}$$

of the nonagesimal degree.

9. Add the moon's latitude to 90° when it is of a contrary name to the latitude of the place; but subtract it from 90° when it is of the same name; the sum or remainder, is the moon's polar distance: also take the difference between the moon's longitude and the longitude of the nonagesimal degree; which difference call P: also let half the sum of the moon's polar distance and altitude of the nonagesimal degree be called Q; and half their difference, R.

10. Add the secant of Q, the cosine of R, and the cotangent of half P, together; the sum is the tangent of an arc *m*: also add the cosecant of Q, the sine of R, and the cotangent of half P, together; the sum is the tangent of an arc *n*.

11. If the altitude of the nonagesimal dergee be greater than

the moon's polar distance, take the sum of the arcs *m* and *n* for the parallactic angle; but if it be less, take their difference.

12. Add the cosecant of the parallactic angle, the sine of P, and the sine of the altitude of the nonagesimal degree, together; the sum (rejecting twice radius) is the sine of the moon's true zenith distance.

13. To the sine of the moon's true zenith distance add the logarithm of the horizontal parallax; the sum (rejecting radius) s the logarithm of the parallax in altitude nearly; add the parallax, thus found, to the true zenith distance, and the sum will be the corrected zenith distance.

14. Add the sine of the corrected zenith distance, the cosine of the parallactic angle, and the logarithm of the horizontal parallax, together; the sum (rejecting twice radius) is the logarithm of the parallax in latitude.

15. Add the logarithm of the parallax in latitude, the tangent of the parallactic angle, and the secant of the moon's latitude, together; the sum (rejecting twice radius) is the logarithm of the parallax in longitude.

EXAMPLE.

"What is the altitude and longitude of the nonagesimal degree at *Ludlow*, whose lat. is 52° 23′ north, and longitude 0h. 11m. west of *Greenwich*, 7th February, 1778, at 10h. 56′ 11″ app. time, being the time of an occultation of μ geminorum."

Not having the Almanac for 1778, I shall assume the moon's latitude to be 0°. 51′ S. and her longitude 91°. 57′.

h	′	″		h	′	″	
10	56	11	ap. time	21	27	14	⊙ AR
0	11	0	diff. long.	10	56	11	
11	7	11	ap. t. *Greenwich*	8	23	25	AR of meridian

52° 23′	latitude.	125° 51 15 = AR	
0 14	correction.	270	
52 9	reduced lat.	144 8 45 = A	
37 51	colat.		
		tang. of latitude	10.11319
18 55	half colat.	tang. of obliquity	9.63761
11 44	half obliq.		
		Sine of 34°.18′ = X	9.75080

C = 30 39	secant	10.06535	cosecant	10.29261
D = 7 11	cosine	9.99658	sine	9.09706
½A = 72 4	cotan.	9.51005	cotan.	9.51005
M = 20 28	tan. M.	9.57198	tan. N.	8.89972
N = 4 32				

25 0	A =	144 9	sin.	9.76765
B = 65 0	Lat.	52. 9	cos.	9.78788
180 0	B	65 0	sec.	10.37405

115 0 long. nonagesimal degree.

Altitude of do. 58 15 S. 9.92958

half ☽'s polar dist. = 45° 26′
half alt. non. deg. = 29 8

Q = 74 34	secant	10.57493	cosecant	10.01595
R = 16 18	cosine	9.98218	sine	9.44819
½P = 11 32	cotan.	10.69025	cotan.	10.69025
m = 86 46	tan. m	11.24736	tan. n	10.15439
n = 54 58				

parallactic angle	= 31 48	cosecant	10.27823
alt. non. degree	58 15	… sine	9.92958
	P = 23 3	… sine	9.59277
moon's true zen. d.	39 11	… sine	9.80058
horizon. parallax	3488	… log.	3.54258
par. in alt. nearly	2204	… log.	3.34316
corrected zen. dist.	39 47 44	sine	9.80628
hor. par.		log.	3.54258
parallactic angle		cosine	9.92936
parallax in latitude =	1898	… log.	3.27822
parallactic angle		… tangent	9.79241
moon's latitude	0 51	… secant	10.00023
parallax in long.	1177	… log.	3.07860

When the moon is very near the ecliptic, as in eclipses, the following method will be nearly exact:

1. Add the cosine of the altitude of the nonagesimal degree to the logarithm of the horizontal parallax; the sum (rejecting radius) is the logarithm of the parallax of latitude nearly: Add this parallax to the complement of the altitude of the nonagesimal degree, and call the sum the complement of the altitude of the nonagesimal degree corrected.

2. Add the cosecant of the complement of the altitude of the nonagesimal degree; the sine of the complement of the altitude of the nonagesimal degree corrected, and the logarithm of the parallax of latitude nearly, together; the sum (rejecting twice radius) is the logarithm of the parallax in latitude corrected.

3. Add the logarithm of the parallax in latitude corrected; the sine of P, and the tangent of the altitude of the nonagesimal degree, together; the sum (rejecting twice radius) is the logarithm of the parallax in longitude.

SCHOLIUM. The method of applying the parallaxes usually given requires no other correction than the following. When the pole of the ecliptic of the same name as the latitude is under the horizon, to the cotangent of the altitude of the nonagesimal degree, add the cotangent of the moon's latitude; the sum is the cosine of an angle; which added to, and, subtracted from, the longitude of nonagesimal degree, gives two longitudes, between which the moon's latitude of a contrary name to the elevated pole is to be increased for the apparent latitude; but beyond those longitudes the moon's true latitude is to be increased by the parallax in latitude to have the apparent latitude.

REMARKS ON THE ARTIFICIAL HORIZONS, &c.

By Mr. REUBEN BURROW.

THE utility of a perfect horizon, and the liableness of quicksilver to be disturbed by the least wind, have induced numbers of people to invent artificial horizons of different kinds, and many of them very complicated. Some time ago having occasion to determine the situation of several places by astronomical observations, and there being no astronomical quadrant belonging to the company in the settlement, I was under a necessity of determining the latitudes by a sextant; and that at a time when the sun passed so near the zenith as to make it impossible to get meridian altitudes: I therefore collected all the different artificial horizons and glass roofs, and other contrivances, for that purpose I could meet with; but, though they appeared correct, the results were very erroneous. I examined them by bringing the two limbs of the sun, seen by direct vision, to touch apparently in the telescope of a sextant, and then observed the reflected images in quicksilver, which still appeared to touch as before; but, on examining the reflected images in the rest of the artificial horizons, none of them appeared to touch; and the error in many was very considerable. I tried a number of other methods with little success, as they were mostly combinations of glasses. At last, accidentally hearing some officers speaking of "Tents that "would neither turn sun nor rain," I considered that the rays of the sun would pass through cloth unrefracted, and in consequence of this idea I applied some thin mosquita* curtain as a covering to the quicksilver, and found it effectually excluded the wind and admitted the sun; and what is of equal consequence in this country, it totally kept away those minute insects that disturb the surface of the quicksilver in observing: in short, it formed so complete a horizon, that I could not before have hoped for any thing so perfect; and it is equally applicable to the sun and stars.

For taking very great or very small elevations of the sun, (which with the common horizon sextants are impracticable in the direct method), a polished metalline instrument might be made in the form of part of a hollow obtuse cone: this might have its axis set perpendicular to the horizon at any time *by means of screws* in a variety of methods; and observations might be made by it with great exactness.

* A kind of silk gauze, as close as book-muslin, and perfectly transparent. It is to be stretched over a hoop, which stands without touching the vessel containing the mercury.

In finding the latitude, when meridian observations cannot be taken, either there is an opportunity of taking altitudes on both sides of the meridian, or not: when there is not, the best method is to calculate the latitude from two altitudes and the time between, exactly by spherical trigonometry, (first correcting the declination to the beginning and end of each interval) as the approximating methods of DOWES, and others, are totally insufficient. When observations can be taken both before and after noon, it is best to take a number of altitudes in both, and then make out the equal altitudes by proportion; then having found the true time of noon by the usual method, correct the two intervals and the declination to each time, and the latitude may be found as follows:

Add *the cosine of the angle from noon, to the cotangent of the declination; the sum is the cotangent of an arc A.*

Add *the sine of A, the sine of the altitude, and the arithmetical complement of the sine of the declination, together; the sum is the cosine of an arc B.*

Then *the sum or difference of A and B is the latitude.*

As every single altitude gives an independent latitude, it is evident the latitude may be thus found to great exactness.

An instrument might easily be contrived to measure the sun's angle of position to great exactness, from whence the latitude might readily be deduced; a small addition to the common theodolite would be sufficient. The variation of the azimuth near the meridian may also be advantageously applied for the same purpose.

DEMONSTRATION of a THEOREM concerning the INTERSECTIONS of CURVES.—By REUBEN BURROW, *Esq.*

IN STONE'S Mathematical Dictionary is the following paragraph: "Two geomatrical lines of any order will cut one another in "as many points as the number expresses, which is produced by the "multiplication of the two numbers expressing those orders:" And Mr. BRAIKONRIDGE in the preface to his *Exercitatio Geomatrica de descriptione Curvarum* says: "Mr. GEORGE CAMPBELL, now Clerk "of the Stores at *Woolwich*, has got a neat demonstration of the "same, which he hopes he will publish." As it does not appear that CAMPBELL ever published any thing, except a paper on the roots of equations, and a small treatise on the plagiarisms of MACLAURIN, it is very probable his demonstration is lost, and therefore it may not be improper to publish the following:

The equation of a line of the first order has one root, or function of the absciss, for the ordinate; of the second order, two; and so on.

In equations for two right lines, the roots may so vary and accommodate themselves to each other, that the quantities expressing the ordinates may be equal; and as there is only one case where this can happen, therefore two right lines can only intersect in one point.

If a line of the first order be compared with a line of the second, or an equation of one root with an equation of two; the root of the first, and a single root of the second, may so vary as to become equal to each other, or to form an intersection. By the same reason, the single root of the first, and the remaining root of the second, may each so vary as to become equal, or to form another intersection; and therefore a right line cuts a line of the second order in two points.

If a line of the first order be compared with a line of the n order, it is also evident that the single root of the first line may in the same manner be so varied with each of the n roots of the second line as to become equal; and therefore a right line may cut a line of the n order in n points.

Let a line of the m order be now compared with a line of the order n; then as each single root of the first line may become equal, in the same manner, to every root in the second, it therefore follows, that for every unit in m there may be n intersections; and as there are m units, there consequently will be mn intersections.

The same method may be applied to the determination of the points, line, and surfaces, that arise from the intersections of lines, surfaces, and solids; by considering that the number of times that p may be taken from m, and q at the same time from n will be $= \dfrac{m.m-1 \ldots\ldots p, \times n.n-1 \ldots q}{1.2.3 \ldots p, \times 1.2.3 \ldots\ldots q}$

XVII.

THE PROCESS OF MAKING ATTAR,

OR ESSENTIAL OIL OF ROSES.

BY LIEUTENANT COLONEL POLIER.

THE *attar* is obtained from the roses by simple distillation, and the following is the mode in which I have made it. A quantity of fresh roses (for example, forty pounds) are put in a still with sixty pounds of water, the roses being left as they are with their calyxes, but with the stems cut close. The mass is then well mixed together with the hands, and a gentle fire is made under the still. When the water begins to grow hot, and fumes to rise, the cap of the still is put on, and the pipe fixed : the chinks are then well luted with paste, and cold water put on the refrigeratory at top. The receiver is also adapted at the end of the pipe ; and the fire is continued under the still, neither too violent nor too weak. When the impregnated water begins to come over, and the still is very hot, the fire is lessened by gentle degrees, and the distillation continued till thirty pounds of water are come over, which is generally done in about four or five hours. This rose-water is to be poured again on a fresh quantity (forty pounds) of roses, and from fifteen to twenty pounds of water are to be drawn by distillation, following the same process as before. The rose-water thus made and cohobated, will be found, if the roses were good and fresh, and the distillation carefully performed, highly scented with the roses. It is then poured into pans either of earthen-ware or of tinned metal, and left exposed to the fresh air for the night. The *attar* or *essence* will be found in the morning congealed, and swimming on the top of the water. This is to be carefully separated, and collected, either with a thin shell or a skimmer, and poured into a vial. When a certain quantity has thus been obtained, the water and feces must be separated from the clear essence, which, with respect to the first, will not be difficult to do, as the essence congeals with a slight cold and the water may then be made to run off. If, after that, the essence is kept fluid by heat, the feces will subside, and may be separated ; but, if the operation has been neatly performed these will be little or none. The feces are as highly perfumed as the essence, and must be kept, after as much of the essence has been skimmed from the rose-water as could be. The remaining water should be used for fresh distillations, instead of common water ; at least as far as it will go.

The above is the whole process of making genuine *attar* of roses. But, as the roses of this country give but a very small quantity of essence, and it is in high esteem, various ways have been thought of to augment the quantity, though at the expense of the quality. In this country it is usual to add to the roses, when put in the still, a quantity of sandal-wood raspings, some more, some less, (from one to five *tolahs*, or half ounces). The sandal contains a deal of essential oil, which comes over freely in the common distillation, and mixing with the rose-water and essence, becomes strongly impregnated with their perfume. The imposition, however, cannot be concealed ; the essential oil of sandal will not congeal in common cold ; and its smell cannot be kept under, but will be apparent and predominate, in spite of every art. In *Cashemire* they seldom use sandal to adulterate the *attar*, but I have been informed, to increase the quantity, they distill with the roses a sweet-scented grass, which does not communicate any unpleasant scent, and gives the *attar* a high clear green colour. This essence also does not congeal in a slight cold as that of roses.

Many other ways of adulteration have been practised, but all so gross and palpable that I shall say nothing of them.

The quantity of essential oil to be obtained from the roses, is very precarious and uncertain, as it depends not only on the skill of the distiller, but also on the qualitity of the roses, and the favourableness of the season. Even in Europe, where the chemists are so perfect in their business, some, as TACHENIUS, obtained only half an ounce of oil from one hundred pounds of roses. HAMBERG obtained one ounce from the same quantity ; and HOFFMAN above two ounces. (N. B. the roses in those instances were stripped of their calyxes, and only the leaves used). In this country nothing like either can be had ; and to obtain four *mashas* (about one drachm and a half) from eighty pounds, which deducting the calyxes, comes to something less than three drachms per hundred pounds of rose-leaves, the season must be very favourable, and the operation carefully performed.

In the present year, 1787, I had only sixteen *tolahs* of *attar* from fifty-four *maunds*, twenty-three *seers*, of roses, produced from a field of thirty-three *biggahs*, or eleven *English* acres; which comes to about two drachms per hundred pounds. The colour of the *attar* of roses is no criterion of its goodness, quality, or country. I have had, this year, *attar* of a fine emerald green, of a bright yellow, and of a reddish hue, from the same ground, and obtained by the same process, only of roses collected at different days.

The calyxes do not in any shape diminish the quality of the *attar*, nor impart any green colour to it; though, perhaps they may augment the quantity: but the trouble necessary to strip them must, and ought to, prevent its being ever put in practice.

Lucknow, May, 1787.

By Mr. MACDONALD, with a Specimen of GOLD.

THE country of *Limong*, on the Island of *Sumatra*, immediately contiguous to the presidency of *Fort Marlbrough*, and between seventy and eighty miles inland, produces the finest gold and gold-dust on that island. The *Limong* gold merchants repair annually to *Marlbrough*, for the purchase of *opium*, and such other articles as they may be in want of; in exchange for which they give gold of so pure a nature as to contain little or no alloy. The gold is found sometimes in dust, and often lodged in a very hard stone. It is of a whitish colour, and resembles that in which the veins run in the gold mines of *Tiltil* in *Chili*. The gold is extracted by beating the compound mass in order to disengage it from the stone, which flies off in splinters, and leaves the gold cleared of it. This is the mode used by a rude people; by which a part of the gold must be lost in the splinters of the stone, which fly off in beating the mass. They are totally ignorant of the advantage of grinding it to a gross powder, mixing it with quicksilver, and separating the earthen and stony particles from those of the gold, by the action of a stream of water on this paste, carrying off the former, and leaving the latter precipitated to the bottom by their greater weight. They are almost entirely ignorant of the principles of assaying and amalgamation, but are extremely expert in separating particles of foreign metals from gold-dust, by a very superior acuteness of vision, no doubt arising from experience, and not a peculiar gift. They have people among them who are gold-cleaners by occupation. The gold is found in a species of earth composed of a clayish-red loam. On digging the earth, it is found to consist of strata (under the loam of the surface, commonly called soil) of irregular-shaped stones of a mouldering nature, mixed with a red clay, and hard pebbles mixed with a pale red clay, of a more dense consistency than that of the first stratum. The first stratum extends to a depth of three feet and a half, and the second to somewhat less. The consistency under these strata is formed of either hard rock, or of gravel nearly approaching to it. The gold is found mixed with a stone of a hard nature, and capable of sustaining a polish. It is found near the surface, and generally in a soil freest from solid rock.

The merchants, who bring the gold for sale, are not themselves the finders or gatherers of it, but receive it, for merchandise, from the *Malays* inhabiting the interior parts of the country. The native indolence of the *Malay* disposition prevents them from collecting more than is sufficient to supply the few and simple wants of a race of men, as yet, unenlightened by civilization and science, and ignorant of the full extent of the advantages of the country inhabited by them. We have not, to this hour, explored a country, which, we have reason to suppose, produces more, or as much gold as either *Peru* or *Mexico*. This may be attributed partly to the difficulties incident to the undertaking, and partly to a want of curiosity, that, indulged, might have been productive of great national and private advantages. The roads leading to this golden country are almost impervious; affording only a scanty path to a single traveller, where whole nights must be passed in the open air, exposed to the malignant influence of a hostile climate, in a country infested by the most ferocious wild beasts. These are circumstances that have hitherto checked curiosity; but perseverance and contrived precaution will surmount the obstacles they furnish, and such discoveries might be made, as would amply compensate for the difficulties leading to them. The gold-merchants who come from the neighbouring and less rich countries, give us such accounts of the facility of procuring gold as border nearly on the marvellous, and would be altogether incredible, if great quantities of that metal produced by them did not, in a great measure, evince the certainty of their accounts. I have seen an imperfect chart of a part of the interior country, made by an intelligent native, on the scale of the rate of his walking, and from the respective situations of the sun in regard to his position. It contained a chain of what he called Gold Mines, extending in latitude, nearly, not much less than three degrees. This chart is in the possession of Mr. MILLER of the council of *Fort Marlbrough*, who did me the favour of explaining it. After making allowances for the licence of a traveller, some credit may be given to this chart, more especially, as we are well assured, that that part of *Sumatra* produces large quantities of fine gold. The result of the whole is, that it would be a very laudable object to explore those rich countries, and to establish the working of gold-mines in them, as it could be done under a certain prospect of advantage. The expense arising from clearing the country, procuring intelligence, making roads, establishing and forming posts of communication, and of employing professional men, would, undoubtedly, be at first very considerable, but the resulting advantages would defray these, and render it a matter of surprise, that a measure attended with such obvious utility had not been adopted at an earlier period.

It is more than probable, that *Sumattra* must have been the *Ophir* of SOLOMON'S time. This conjecture derives no small force from the word ophir's being really a *Malay* substantive of a compound sense, signifying a mountain containing gold. The natives have no oral or written tradition on the subject, excepting, that the island has in former times afforded gold for exportation: whether to the eastward or westward remains an uncertainty. We have certain accounts that the vessels that imported this article were long detained, or did not return in much less than a year. It is therefore probable that they wintered, during the violence of the S.W. monsoon, either at *Ceylon*, or on the N.E. coast, and completed their voyages during the moderate part of the other monsoon.

XVIII.

On the LITERATURE of the HINDUS,

FROM THE SANSCRIT,

Communicated by GOVERDHAN CAUL,

With a short Commentary.

THE TEXT.

THERE are eighteen *Vidyás* or parts of *true knowledge*, and some branches of knowledge *falsely so called;* of both which a short account shall here be exhibited.

The first *four* are the immortal *Védas*, evidently revealed by God; which are entitled, in one compound word, *Rigyajuhsámátharva*, or, in separate words, *Rick*, *Yajush*, *Sáman*, and *Atharvan.* The *Rigvéda* consists of *five* sections; the *Yajurvéda*, of *eighty-six;* the *Sámavéda*, of a *thousand;* and the *Atharvavéda*, of *nine;* with eleven hundred *s'ác'has* or branches, in various divisions and subdivisions. The *Védas* in truth are infinite; but were reduced by Vya'sa to this number and order: the principal part of them is that which explains the duties of man in a methodical arrangement; and in the *fourth* is a system of divine ordinances.

From these are deduced the four *Upavédas*, namely, *Ayush*, *Gándharva*, *Dhanush*, and *Sthápatya;* the first of which, or *Ayurvéda*, was delivered to mankind by Brahma', Indra, Dhanwantari, and *five* other deities; and comprises the theory of disorders and medicines, with the practical methods of curing diseases. The second, or music, was invented and explained by Bharata: it is chiefly useful in raising the mind by devotion to the felicity of the Divine Nature. The third *Upavéda* was composed by Vis'wamitra on the fabrication and use of arms and implements handled in war by the tribe of *Cshatriyas.* Vis'wacarman revealed the *fourth* in various treatises on *sixty-four* mechanical arts, for the improvement of such as exercise them.

Six *Angas*, or *bodies* of *learning*, are also derived from the same source: their names are *Sicshà*, *Calpa*, *Vyácarana*, *Chhandas*, *Jyótish*,

and *Niructi.* The *first* was written by Pa'nini, an inspired saint, on the *pronunciation* of vocal sounds; the *second* contains a detail of religious acts and ceremonies from the first to the last; and from the branches of these works a variety of rules have been framed by A's'wala'yana, and others. The *third*, or the grammar, entitled *Pán'inìya*, consisting of *eight* lectures or chapters, (*Vriddhirádaij*, and so forth), was the production of three *Rìshis*, or holy men, and teaches the proper discriminations of words in construction; but other less abstruse grammars, compiled merely for popular use, are not considered as *Angas.* The *fourth*, or *prosody*, was taught by a *Muni*, named Pingala, and treats of charms and incantations in verses aptly framed and variously measured; such as the *Gáyatri*, and a thousand others. *Astronomy* is the *fifth* of the *Védángas*, as it was delivered by Su'rya, and other divine persons: it is necessary in calculations of time. The *sixth*, or *Niructi*, was composed by Ya'sca (so is the manuscript; but, perhaps, it should be Vya'sa) on the signification of difficult words and phrases in the *Védas.*

Lastly, there are four *Upángas*, called *Purána*, *Nyáya*, *Mímánsà*, and *Dherma s'ástra.* Eighteen *Puránas*, that of Brahma', and the rest, were composed by Vya'sa for the instruction and entertainment of mankind in general. *Nyáya* is derived from the root *ní*, to *acquire* or *apprehend;* and, in this sense, the books on *apprehension*, *reasoning*, and *judgment*, are called *Nyáya.* The principal of these are the work of Gautama, in *five* chapters, and that of Cana'da, in *ten;* both teaching the meaning of sacred texts, the difference between just and unjust, right and wrong, and the principles of knowledge, all arranged under *twenty-three* heads. *Mímánsà* is also *twofold;* both showing what acts are pure or impure, what objects are to be desired or avoided, and by what means the soul may ascend to the First Principle. The *former*, or *Carma Mímánsà*, comprised in *twelve* chapters, was written by Jaimini, and discusses questions of moral duties and law. Next follows the *Upásaná Cánda* in four lectures. (*Sancarshana* and the rest), containing a survey of Religious Duties; to which part belong the rules of Sa'ndilya, and others, on devotion and duty to God. Such are the contents of the *Púrva*, or *former*, *Mímánsà.* The *Uttara*, or *latter*, abounding in questions on the Divine Nature and other sublime speculations, was composed by Vya'sa, in *four* chapters and *sixteen* sections: it may be considered as the brain and spring of all the *Angas;* it exposes the heretical opinions of RA'MA'NUJA, MA'DHWA, VALLABHA, and other sophists; and, in a manner suited to the comprehension of adepts, it treats on the true nature of GANE'SA, BHA'SCARA, or the Sun, NI'LACANTA, LACSHMI', and other *forms* of One Divine Being. A similar work was written by SRI'-S'ANCARA, demonstrating the supreme power, goodness, and eternity of GOD.

The Body of *Law,* called *Smrĭti,* consists of *eighteen* books, each divided under three general heads, the duties of *religion,* the administration of *justice,* and the punishment or *expiation* of crimes. They were delivered, for the instruction of the human species, by MENU, and other sacred personages.

As to *ethics,* the *Védas* contain all that relates to the duties of kings; the *Puránas* what belongs to the relation of husband and wife; and the duties of friendship and society (which complete the triple division) are taught succinctly in both: this double division of *Angas* and *Upángas* may be considered as denoting the double benefit arising from them in *theory* and *practice.*

The *Bhárata Rámáyana,* which are both *epic* and *poems,* comprise the most valuable part of ancient history.

For the information of the lower classes in religious knowledge, the *Pásúpata,* the *Pancharátra,* and other works, fit for nightly meditation, were composed by SIVA, and others, in an hundred and ninety-two parts on different subjects.

What follow are not really divine, but contain infinite contradictions. *Sánc'hya* is twofold, that with IS'WARA and that without IS'WARA. The *former* is entitled *Pátanjala* in one chapter of four sections, and is useful in removing doubts by pious contemplation; the *second,* or *Cápila,* is in six chapters on the production of all things by the union of PRACRITI, or *nature,* and PURUSHA, or the *first male:* it comprises also, in eight parts, rules for devotion, thoughts on the invisible power, and other topics. Both these works contain a studied and accurate *enumeration* of natural bodies and their principles; whence this philosophy is named *Sánc'hya.* Others hold, that it was so called from its *reckoning three sorts* of *pain.*

The *Mímánsá,* therefore, is in *two* parts; the *Nyáya,* in *two;* and the *Sa'nc'hya,* in *two;* and these *six* schools comprehend all the doctrine of the Theists.

Last of all appears a work written by BUDDHA; and there are also *six* atheistical systems of philosophy, entitled *Yógáchára, Saudhánta, Vaibháshica, Mádhyamica, Digambara,* and *Chárvác;* all full of indeterminate phrases, errors in sense, confusion between distinct qualities, incomprehensible notions, opinions not duly weighed, tenets destructive of natural equality, containing a jumble of atheism and ethics; distributed, like our orthodox books, into a number of sections, which omit what ought to be expressed, and express what ought to be omitted; abounding in false propositions, idle propositions, impertinent propositions. Some assert, that the heterodox schools have no *Upángas;* others, that they have six *Angas,* and as many *Sángas,* or *bodies,* and other *appendices.*

Such is the analysis of universal knowledge, *practical* and *speculative.*

THE COMMENTARY.

This first chapter of a rare *Sanscrit* book, entitled *Vidyádersa,* or a *View of Learning,* is written in so close and concise a style, that some parts of it are very obscure, and the whole requires an explanation. From the beginning of it we learn, that the *Védas* are considered by the *Hindus* as the fountain of all knowledge, human and divine; whence the verses of them are said in the *Gítá* to be the *leaves* of that holy tree, to which the Almighty himself is compared:

úrdhwa múlam adhah s'ác'ham as'watt'ham práhuravyayam
ch'handánsi yasya pernáni yastam véda sa védavit.

"The wise have called the Incorruptible One an *As'watt'ha,* "with its roots above and its branches below; the leaves of which "are the sacred measures. He, who knows this tree, knows the "*Védas.*"

All the *Pandits* insist, that *As'watt'ha* means the *Pippala,* or *Religious Fig-tree,* with heart-shaped pointed, and tremulous leaves; but the comparison of heavenly knowledge, descending and taking root on earth, to the *Vat'a,* or great *Indian* fig-tree, which has most conspicuously its roots on high, or at least has radicating branches, would have been far more exact and striking.

The *Védas* consist of three *Cán'd'as,* or *General Heads;* namely, *Carma, Jnyána, Upásanà;* or *Works, Faith,* and *Worship:* to the first of which the author of the *Vidyádersa* wisely gives the preference, as MENU himself prefers *universal benevolence* to the *ceremonies* of religion:

Japyénaiva tu sansiddhyèdbráhma nó nátra sansayah:
Curyádanyatravá curyánmaitró bra'hmana uchyatè.

That is, "By silent adoration undoubtedly a *Bráhman* attains holi-"ness; but every *benevolent man,* whether he perform or omit that "ceremony, is justly styled a *Bráhman.*" This triple division of the *Védas* may seem at first to throw light on a very obscure line in the *Gìtà:*

Traigunyavishayah védà nistraigunya bhavárjuna;

Or, "The *Védas* are attended with *three* qualities: be not thou a "man of *three* qualities, O ARJUNA."

But several *Pandits* are of opinion, that the phrase must relate to the three *Gúnas,* or *qualities* of the mind, that of *excellence,* that of *passion,* and that of *darkness;* from the last of which a Hero should be wholly exempt, though examples of it occur in the *Védas,* where animals are ordered to be *sacrificed,* and where horrid incantations are inserted for the *destruction* of enemies.

It is extremely singular, as Mr. WILKINS has already observed, that, notwithstanding the fable of BRAHMA'S *four* mouths, each of which uttered a *Véda,* yet most ancient writers mention only *three Védas,* in order as they occur in the compound word *Rigyajuhsáma;* whence it is inferred, that the *At'harvan* was written or collected after the three first; and the two following arguments, which are entirely new, will strongly confirm this inference. In the eleventh book of MENU, a work ascribed to the *first* age of mankind, and certainly of high antiquity, the *At'harvan* is mentioned by name, and styled the *Véda* of *Védas;* a phrase which countenances the notion of DA'RA' SHECU'H, who asserts, in the preface to his *Upanishat,* that "the "*three* first *Védas* are named separately, because the *At'harvan* is a "corollary from them all, and contains the quintessence of them." But this verse of MENU, which occurs in a modern copy of the work brought from *Bánáras,* and which would support the antiquity and excellence of the *fourth Véda,* is entirely omitted in the best copies, and particularly in a very fine one written at *Gayá,* where it was accurately collated by a learned *Bráhman;* so that, as

MENU himself, in other places, names only three *Védas,* we must believe this line to be an interpolation by some admirer of the *At'harvan;* and such an artifice overthrows the very doctrine, which it was intended to sustain.

The next argument is yet stronger, since it arises from *internal* evidence; and of this we are now enabled to judge by the noble zeal of Colonel POLIER in collecting *Indian* curiosities; which has been so judiciously applied and so happily exerted, that he now possesses a complete copy of the *four Védas* in eleven large volumes.

On a cursory inspection of those books it appears, that even a learner of *Sanscrit* may read a considerable part of the *At'harva-véda* without a dictionary; but that the style of the other *three* is so obsolete, as to seem almost a different dialect. When we are informed, therefore, that few *Bráhmans* at *Bánáras* can understand any part of the *Védas,* we must presume, that none are meant, but the *Rick, Yajush,* and *Sáman,* with an exception of the *At'harvan,* the language of which is comparatively modern; as the learned will perceive from the following specimen:

Yatra brahmavidò yánti dícshayà tapasà saha agnirmántatra nayatwagnirmédhán dedhátumè, agnayé swáhà. váyurmán tatra nayatu váyuh prán'án dedhátu mè, váyuwè swáhà. súryò má ntatra nayatu chacshuh suryò dedhátu mè, suryáya swáhà; chandrò mán tatra nayatu manaschandrò dedhátu mé, chandráya swáhà. sómò mán tatra nayatu payah sómò dedhátu mé, sómáya swáhà. Indrò *mán tatra nayatu balamindrò dedhátu mé, indráya swáhà. ápò mán tatra nayatwámrítammópatishtatu, adbhyah swáhà. yatra brahmavidò yánti dícshayà tapasà saha, brahmà mán tatra nayatu brahma brahmà dedhátu mé, brahmanè swáhà.*

That is, "Where they, who know the Great One, go, through holy "rites and through piety, thither may *fire* raise me! May fire re-"ceive my sacrifices! Mysterious praise to fire! May *air* waft me "thither! May air increase my spirits! Mysterious praise to "air! May the *Sun* draw me thither! May the sun enlighten my "eye! Mysterious praise to the sun! May the *Moon* bear me "thither! May the moon receive my mind! Mysterious praise to "the moon! May the plant *Sóma* lead me thither! May *Sóma* "bestow on me its hallowed milk! Mysterious praise to *Sóma!* "May INDRA, or the *firmament,* carry me thither! May INDRA "give me strength! Mysterious praise to INDRA! May *water* "bear me thither! May water bring me the stream of immortality!

"Mysterious praise to the waters! Where they, who know the "Great One, go, through holy rites and through piety, thither may "BRAHMA´ conduct me! May BRAHMA´ lead me to the Great One! "Mysterious praise to BRAHMA´!"

Several other passages might have been cited from the first book of the *At'harvan*, particularly a tremendous *incantation* with consecrated *grass*, called *Dúrbbha*, and a sublime hymn to *Cála*, or time; but a single passage will suffice to show the style and language of this extraordinary work. It would not be so easy to produce a genuine extract from the other *Védas*. Indeed, in a book, entitled *Sivavédánta*, written in *Sanscrit*, but in *Cáshmirian* letters, a stanza from the *Yajurvéda* is introduced; which deserves for its sublimity to be quoted here; though the regular cadence of the verses, and the polished elegance of the language, cannot but induce a suspicion, that it is a more modern paraphrase of some text in the ancient Scripture:

natatra súryò bháti nacha chandra táracau, némá vidyutó bhánti cuta éva vahnih: taméva bhántam anubháti servam, tasya bhásá servamidam vibháti.

That is, "There the sun shines not, nor the moon and stars. "These lightnings flash not *in that place;* how should even fire "blaze *there?* GOD irradiates all this bright substance; and by "its effulgence the universe is enlightened."

After all, the books on divine *knowledge*, called *Véda*, or what is *known*, and *Sruti*, or what has been *heard*, from revelation, are still supposed to be very numerous; and the *four* here mentioned are thought to have been selected, as containing all the information necessary for man. MOHSANI FA'NI´, the very candid and ingenious author of the *Dabistàn*, describes in his first chapter a race of old *Persian* sages, who appear from the whole of his account to have been *Hindus;* and we cannot doubt, that the book of MAHA´BA´D, or MENU, which was written, he says, *in a celestial dialect*, means the *Véda;* so that, as ZERA'TUSHT was only a reformer, we find in *India* the true source of the ancient *Persian* religion. To this head belong the numerous *Tantra*, *Mantra*, *Agama*, and *Nigama*, *Sástras*, which consist of *incantations* and other texts of the *Védas*, with remarks on the occasions, on which they may be successfully applied. It must not be omitted, that the *Commentaries* on the

Hindu Scriptures, among which that of VASISHTHA seems to be reputed the most excellent, are innumerable; but, while we have access to the fountains, we need not waste our time in tracing the rivulets.

From the *Védas* are immediately deduced the practical arts of *Chirurgery* and *Medicine*, *Music* and *Dancing; Archery*, which comprises the whole art of war, and *Architecture*, under which the system of *mechanical* arts is included. According to the *Pandits*, who instructed ABULFAZL, each of the *four* Scriptures gave rise to one of the *Upavédas* or *Sub-scriptures*, in the order in which they have been mentioned; but this exactness of analogy seems to favour of refinement.

Infinite advantage may be derived by *Europeans* from the various *medical* books in *Sanscrit*, which contain the names and descriptions of *Indian* plants and minerals, with their uses, discovered by experience, in curing disorders. There is a vast collection of them from the *Characa*, which is considered as a work of SIVA, to the *Róganirúpana* and the *Nidána*, which are comparatively modern. A number of books, in prose and verse, have been written on *Music*, with specimens of *Hindu* airs in a very elegant notation; but the *Silpa sás'tra*, or Body of Treatises on *Mechanical Arts*, is believed to be lost.

Next in order to these are the six *Védángas*, three of which belong to *Grammar*. One relates to religious ceremonies; a fifth to the whole compass of Mathematics, in which the author of *Lílávatí* was esteemed the most skilful man of his time; and the *sixth*, to the explanation of obscure words or phrases in the *Védas*. The grammatical work of PA'NINI, a writer supposed to have been inspired, is entitled *Siddhánta Caumudi*, and is so abstruse as to require the lucubrations of many years before it can be perfectly understood. When *Cás'ináthа Serman*, who attended Mr. WILKINS, was asked what he thought of the *Pán'iníya*, he answered very expressively, that "it was a forest;" but, since grammar is only an instrument, not the end, of true knowledge, there can be little occasion to travel over so rough and gloomy a path; which contains, however, probably some acute speculations in *Metaphysics*. The *Sanscrit* Prosody is easy and beautiful: the learned will find in it almost all the measures of the *Greeks;* and it is remarkable, that the language of the *Bráhmans* runs very naturally into *Sapphics, Alcaics*, and *Iambics*. Astronomical works in this language are exceedingly numerous: seventy-nine of them are specified in one list; and, if they contain the names of the principal stars visible in *India*, with observations on their positions in different ages, what discoveries may be made in Science, and what certainty attained in ancient Chronology?

Subordinate to these *Angas* (though the reason of the arrangement is not obvious) are the series of *Sacred Poems*, the Body of *Law*, and the *six* Philosophical *s'astrás*; which the author of our text reduces to *two*, each consisting of *two* parts, and rejects a *third*, in *two* parts also, as not perfectly *orthodox*; that is, not strictly conformable to his own principles.

The first *Indian* Poet was VA'LMI'CI, author of the *Rámáyana*, a complete epic poem on one continued, interesting, and heroic action; and the next in celebrity, if it be not superior in reputation for holiness, was the *Máhábhárata* of VYA'SA. To him are ascribed the sacred *Puránas*, which are called, for their excellence, *the Eighteen*, and which have the following titles: BRAHME, or the *Great One*; PEDMA, or the *Lotos*; BRA'HMA'ND'A, or the *Mundane Egg*; and AGNI, or *Fire*; (these *four* relate to the *Creation*;) VISHNU, or the *Pervader*; GARUD'A, or his *Eagle*; the Transformations of BRAHMA', SIVA, LINGA; NA'REDA, son of BRAHMA; SCANDA, son of SIVA; MARCANDEYA, or the Immortal Man; and BHAVISHYA, or the *Prediction of Futurity*; (these *nine* belong to the *attributes* and *powers* of the Deity;) and *four* others, MATSYA, VARA'HA, CU'RMA, VA'MENA, or as many incarnations of the Great One in his character of *Preserver*; all containing ancient traditions embellished by poetry or disguised by fable. The *eighteenth* is the BHA'GAWATA, or Life of CRISHNA, with which the same Poet is by some imagined to have crowned the whole series; though others, with more reason, assign them different composers.

The system of *Hindu* Law, besides the fine work, called MENUSMRITI, or "what is *remembered* from MENU," that of YA'JNYAVALCYA, and those of *sixteen* other *Munis*, with *Commentaries* on them all, consists of many tracts in high estimation, among which those current in *Bengal* are an excellent treatise on *Inheritances* by JI'MU'TA VA'HANA, and a complete *Digest*, in *twenty-seven* volumes, compiled

a few centuries ago by RAGHUNANDAN, the TRIBONIAN of *India*, whose work is the grand repository of all that can be known on a subject so curious in itself, and so interesting to the *British* Government.

Of the philosophical schools it will be sufficient here to remark, that the first *Nyáya* seems analogous to the *Peripatetic*; the *second*, sometimes called *Vias'éshica*, to the *Ionic*; the two *Mimánsás*, of which the *second* is often distinguished by the name of *Védánta*, to the *Platonic*; the first *Sánc'hya* to the *Italic*; and the second, or *Pátanjala*, to the *Stoic*, Philosophy: so that GAUTAMA corresponds with ARISTOTLE; CANA'DA with THALES; JAIMINI with SOCRATES; VYA'SA with PLATO; CAPILA with PYTHAGORAS; and PATANJALI with ZENO; but an accurate comparison between the *Greecian* and *Indian* schools would require a considerable volume. The original works of those Philosophers are very succinct; but, like all the other *Sa'stras*, they are explained, or obscured, by the *Upadersana* or *Commentaries*, without end. One of the finest compositions on the philosophy of the *Védánta* is entitled *Yóga Va'sisht'ha*, and contains the instructions of the great VA'SISHT'HA to his pupil, RA'MA, king of *Ayódhyà*.

It results from this analysis of *Hindu* Literature, that the *Véda Upavéda, Véda'nga, Purána, Dherma*, and *Ders'ana* are the *six* great *Sástras*, in which all knowledge, divine and human, is supposed to be comprehended; and here we must not forget, that the word *Sástra*, derived from a root signifying *to ordain*, means generally an *ordinance*, and particularly a *sacred ordinance* delivered by inspiration. Properly, therefore, this word is applied only to *sacred literature*, of which the text exhibits an accurate sketch.

THE *Súdras*, or *fourth* class of *Hindus*, are not permitted to study the *six* proper *Sástras* before enumerated; but an ample field remains for them in the study of *profane literature*, comprized in a multitude of *popular* books, which correspond with the several *Sástras*, and abound with beauties of every kind. All the tracts on *medicine* must, indeed, be studied by the *Vaidyas*, or those who are born Physicians; and they have often more learning, with far less pride, than any of the *Bráhmans*. They are usually poets, grammarians, rhetoricians, moralists; and may be esteemed in general the most virtuous and amiable of the *Hindus*. Instead of the *Védas* they study the *Rájníty*, or *Instruction of Princes*; and, instead of

Law, the *Nítisástra*, or general system of *Ethics*. Their *Sahitya*, or *Cávya Sástra* consists of inumerable poems, written chiefly by the *medical* tribe, and supplying the place of the *Puránas*, since they contain all the stories of the *Rámáyana*, *Bhara'ta*, and *Bha'gawata*. They have access to many treatises of *Alancára*, or Rhetoric, with a variety of works in modulated Prose. To *Upác'hyána*, or Civil History, called also *Rájatarangini;* to the *Nátaca*, which answers to the *Gándharvavéda*, consisting of regular *Dramatic* pieces in *Sanscrit* and *Prácrit:* besides which they commonly get by heart some entire dictionary and grammar. The best Lexicon or Vocabulary was composed in verse, for the assistance of the memory, by the illustrious AMARSINHA; but there are *seventeen* others in great repute: the best Grammar is the *Múgdhabódha*, or the *Beauty of Knowledge*, written by a *Góswámi*, named VO'PADE'VA, and comprehending, in two hundred short pages, all that a learner of the language can have occasion to know. To the *Cóshas*, or dictionaries, are usually annexed very ample *Tícás*, or *etymological* commentaries.

We need say no more of the heterodox writings, than that those on the religion and philosophy of BUDDHA seem to be connected with some of the most curious parts of *Asiatic* history, and contain, perhaps, all that could be found in the *Páli*, or *sacred language* of the eastern *Indian* peninsula. It is asserted in *Bengal*, that AMARSINHA himself was a *Bauddha;* but he seems to have been a theist of tolerant principles, and, like ABULFAZL, desirous of reconciling the different religions of *India*.

Wherever we direct our attention to *Hindu* Literature, the notion of *infinity* presents itself; and the longest life would not be sufficient for the perusal of near five hundred thousand stanzas in the *Purânas*, with a million more perhaps in the other works before mentioned. We may, however, select the best from each *Sástra*, and gather the fruits of science, without loading ourselves with the leaves and branches; while we have the pleasure to find, that the learned *Hindus*, encouraged by the mildness of our government and manners, are at least as eager to communicate their knowledge of all kinds, as we can be to receive it. Since *Europeans* are indebted to the *Dutch* for almost all they know of *Arabic*, and to the *French* for all they know of *Chinese*, let them now receive from our nation the first accurate knowledge of *Sanscrit*, and of the valuable works composed in it; but, if they wish to form a correct idea of *Indian* religion and literature, let them begin with forgetting all that has been written on the subject, by ancients or moderns, before the publication of the *Gítà*.

TO THE PRESIDENT.

MY DEAR SIR,

I HEREWITH send you six ancient Copper Plates, fastened together by a ring in two parcels, each containing three. They were found in digging foundations for some new works at the Fort of *Tanna*, the capital of *Salset*. The Governor of *Bombay* informed me none of the *Gujerat Brahmins* could explain the Inscriptions. I obtained permission to bring them round with me, being desirous of submitting them to the investigation of the ASIATIC SOCIETY, under the promise of restoring them to the proprietor.

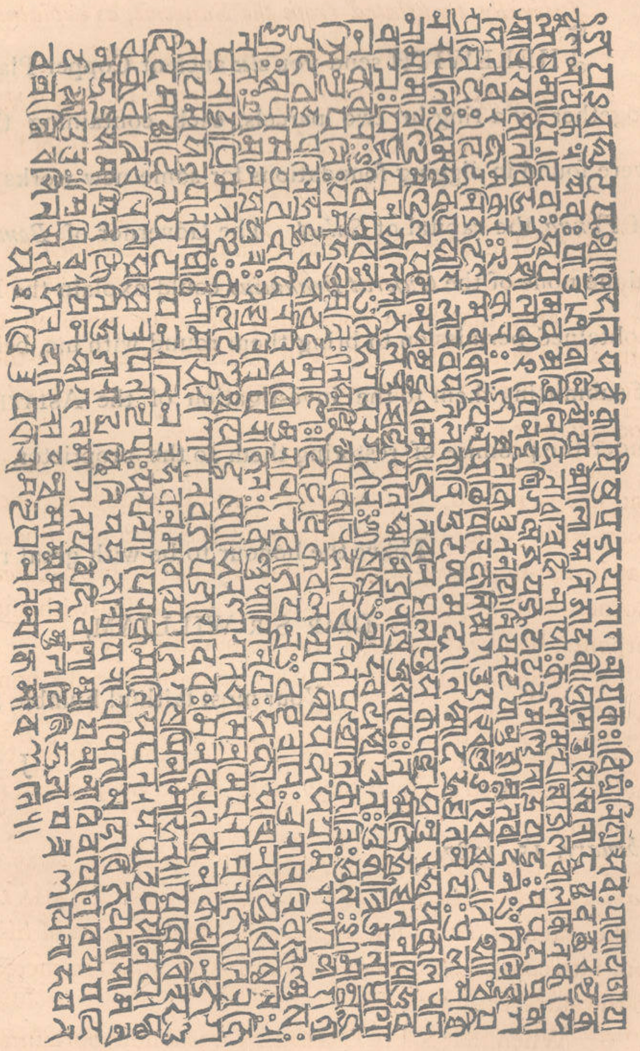
I have the honour to be with great respect,

DEAR SIR WILLIAM,

Your most faithful humble Servant,

J. CARNAC.

February, 15, 1787.



Vol. I.

P. 299.

XIX.

AN INDIAN GRANT OF LAND, IN Y. C. 1018,

Literally translated from the Sanscrit, as explained by

RA'MALO'CHAN PANDIT,

COMMUNICATED by GENERAL CARNAC.

O'M. VICTORY AND ELEVATION!

STANZAS.

MAY He, who in all affairs claims precedence in adoration; may that *Gan'anáyaca*, averting calamity, preserve you from danger!

2. May that SIVA constantly preserve you, on whose head shines (GANGA') the daughter of JAHNU resembling-the-pure-crescent-rising-from the-summit-of-SUME'RU! *(a compound word of sixteen syllables.)*

3. May that God, the cause of success, the cause of felicity, who keeps, placed even by himself on his forehead a section of the-moon-with cool-beams, drawn-in-the-form-of-a-line-resembling-that-in-the-infinitely-bright spike-of-a-fresh-blown-*Cétaca* (who is) adorned-with-a-grove-of-thick-red locks-tied-with-the-Prince-of-Serpents, be always present and favourable to you!

4. The son of JI'MU'TACE'TU ever affectionate, named JI'MU'-TAVA'HANA, who, surely, preserved (the Serpent) S'ANC'HACHU'D'A from *Garud'a*, *(the Eagle of* VISHNU) *was* famed in the three worlds, having neglected his own body, as if it had been grass, for the sake of others.

5. *(Two couplets in rhyme)* In his family was a monarch *(named)* CAPARDIN, (or, *with thick hair*, a title of MAHA'DE'VA) chief of the race of SI'LA'RA, repressing the insolence of his foes; and from him came a son, named PULAS'ACTI, equal in increasing glory to the sun's bright circle.

6. When that son of CAPARDIN was a new-born infant, through fear of him, homage was paid by all his collected enemies, with water held aloft in their hands, to the delight of his realm.

7. From him came a son, the only warrior on earth, named SRI'VAPPUVANNA, a hero in the theatre of battle.

8. His son, called S´RI' JHANJHA, was highly celebrated, and the preserver *of his country;* he afterwards became the Sovereign of *Gógni:* he had a beautiful form.

8. From him *came* a son, whose-renown-was-far-extended-*and-who*-confounded-the-mind-with-his-wonderful-acts, the fortunate BAJJADA DE´VA. He was a monarch, a gem in-the-diadem-of-the-world's-circumference; who used only the forcible weapon of his two arms readily on the plain of combat; and in whose bosom the Fortune of Kings herself amorously played, as *in the bosom* of the foe of MURA, (or VISHNU.)

9. Like JAYANTA, *son* to the foe of VRITRA, (or INDRA,) like SHANMUC'HA, (or CARTICE'YA,) *son* to PURA'RI, (or MAHA'DE'VA,) then sprang from him a fortunate son, with a true heart, invincible;

10. Who in liberality was CARNA before our eyes, in truth even YUDHISHTHIRA, in glory a blazing Sun, and the rod of CA´LA (or YAMA, *judge of the infernal regions)* to his enemies.

11. By whom the great counsellors, who were under his protection, *and* others near *him*, are preserved in this world: he is a conqueror, named with propriety S´ARANA´GATA VAJRAPANJARA-DE´VA.

12. By whom when this world was over-shadowed with-continual-presents-of-gold, for his liberality he was named JAGADARTHI (or *Enriching the World)* in the midst of the three regions of the universe.

13. Those Kings assuredly, whoever they may be, who are endued with minds capable of ruling their respective dominions, praise him for the greatness of his veracity, generosity, and valour; *and* to those Princes, who are deprived of their domains, and seek his protection, he allots a firm settlement. May he, the grandfather of the RA´YA, be victorious! *He is* the spiritual guide of *his* counsellors, *and they are* his pupils. Yet farther.

14. He, by whom the title of GO´MMA'YA was conferred on *a person* who attained the object of his desire; by whom the realm, shaken by a man named E'YAPADE´VA, was even made firm; and by whom, being the Prince of *Mamalambuva,* (I suppose, *Mambéï,* or *Bombay,)* security from fear was given to me broken *with affliction.* He was the King, named S´RI´ VIRUDANCA. How can he be otherwise painted? *Here six syllables are effaced in one of the Grants; and this verse is not in the other.*

15. His son *was* named BAJJADADE´VA, a gem on the forehead of monarchs, eminently skilled in morality; whose deep thoughts all the people, clad in horrid armour, praise even to this day.

16. Then was born his brother the Prince ARICE'SARI, (a lion among his foes,) the best of good men; who, by overthrowing the strong mountain of his proud enemies, did the act of a thunderbolt; having formed great designs even in his childhood, and having seen the Lord of the Moon (MAHA´DE´VA) *standing* before him, he marched by his father's order, attended by his troops, and by valour subdued the world.

Yet more————————.

17. Having raised up his slain foe on his sharp sword, he so afflicted the women in the hostile palaces, that their forelocks fell disordered, their garlands of bright flowers dropped from their necks on the vases of their breasts, and the black lustre of their eyes disappeared.

18. A *warrior*, the plant of whose fame grows up over the temple of BRAHMA'S Egg, (the universe,) from the repeated-watering-of-it-with-the-drops-that-fell-from-the-eyes-of-the-wives-of-his-slaughtered-foe.

Afterwards by the multitude of his innate virtues *(then follows a compound word of an hundred and fifty-two syllables)* the-fortunate-ARICE'SARI-DE´VARA'JA-Lord-of-the-great-circle-adorned-with-all-the-company-of-princes-with-VAJRAPANJARA-of-whom-men-seek-the-protection-an-elephant's-hook-in-the-forehead-of-the-world-pleased-with-increasing-vice-a-Flamingo-bird-in-the-pool-decked-with-flowers-like-those-of-paradise-and-with-A´DITYA-PANDITA-chief-of-the-districts-of-the-world-through-the-liberality-of-the-lord-of-the-Western-Sea-holder-of-innate-knowledge-who-bears-a-golden-eagle-on-his-standard-descended-from-the-stock-of-JI'MU'-TAVA'HANA-king-of-the-race-of-*Silára*-Sovereign-of-the-City-of-*Tagara*-Supreme-ruler-of-exalted-counsellors-assembled-when-extended-fame-had-been-attained *(the monarch* thus described) governs-the-whole-region-of-*Cóncana*-consisting-of-fourteen-hundred-villages-with-cities-and-other-places-comprehended-in-many-districts-acquired-by-his-arm. Thus he supports the burden of thought concerning this domain. The Chief-Minister S'RI' VA'SAPAIYA *and* the very-religiously-purified S'RI' VA'RDHIYAPAIYA being at this time present, he, the fortunate ARICE'SARIDE'VARA'JA, Sovereign of the great circle, *thus addresses* even all who inhabit-the-city-S'RI' STHA'NACA, (*or the Mansion of* LACSHMI',) his-own-kinsmen-and-others-there-assembled, princes-counsellors-priests-ministers-superiors-inferiors-subject-to-his-commands, also the-lords-of-districts,-the-Governors-of-towns-chiefs-of-villages-the-masters-of-families-employed-or-unemployed-servants-of-the-King-and-*his*-countrymen. Thus he greets all-the-holy-men-and-others-inhabiting-the-city-of *Hanyamana*. Reverence be to you, as it is becoming, with all the marks of respect, salutation, and praise!

STANZA.

Wealth is inconstant; youth, destroyed in an instant; *and* life, placed between the teeth of CRITANTA, (*or* YAMA *before mentioned.*)

Nevertheless, neglect *is shown* to the felicity of departed ancestors. Oh! how astonishing are the efforts of men!

And thus.—Youth is publicly swallowed-up-by-the-giantess Old-Age admitted-into-its-inner mansion; and the bodily-frame-is-equally-obnoxious-to-the- assult-of-death-of-age-and-the-misery-born-with-man-of-separation–between–united–friends–like–falling–from-heaven-into-the-lower regions. Riches and life are two things more-moveable-than-a-drop-of water–trembling-on-the-leaf-of–a–lotos-shaken-by-the-wind; and the world is like-the-first delicate-foliage-of-a-plantain-tree. Considering this in secret with a firm dispassionate understanding, and also the fruit of liberal donations mentioned *by the wise, I called to mind these*

STANZAS.

1. In the *Satya*, *Trétá*, and *Dwáper* ages, great piety was celebrated: but in this *Caliyuga* the *Munis* have nothing to commend but liberality.

2. Not so productive of fruit is learning, not so productive is piety, as liberality, say the *Munis* in this *Cali* age. And thus was it said by the Divine VYA'SA:

3. Gold *was* the first offspring of Fire; the Earth *is* the daughter of VISHNU, and kine are the children of the Sun: the three worlds, *therefore*, are assuredly given by him, who makes a gift of gold, earth, and cattle.

4. *Our* deceased fathers clap their hands, *our* grandfathers exult: *saying*, "a donor of land is born in our family: he will redeem us."

5. A donation of land to good persons, for holy pilgrimages, and on the (five) solemn days of the moon, is the means of passing over the deep boundless ocean of the world.

6. White parasols, and elephants mad with pride, (the *insignia* of royalty,) *are* the flowers of a grant of land: the fruit *is* INDRA in heaven.

Thus, confirming the declarations of the-ancient-*Munis*-learned-in-the distinction-between-justice-and-injustice, for the sake of benefit to my mother, my father, and myself, on the fifteenth of the bright moon of *Cártica*, in the middle of the year *Pingala*, (perhaps of the *Serpent*,) when nine hundred and forty years, save one, are reckoned as past from the time of King S'ACA, or, in figures, the year 939, of the bright moon of *Cártica* 15; (that is, 1708—939 = 769 years ago from Y. C. 1787.) The moon being then full and eclipsed, I having bathed in the opposite sea resembling-the-girdles-round-the-waist-of-the-female-Earth, tinged-with-a-variety-of-rays-like-many-exceedingly-bright-rubies,-pearls-*and-other*-gems, with-water-whose-mud-was-become-musk-through-the-frequent-bathing-of-the-fragrant-bosom-of-beautiful-Goddesses-rising-up-after-having-dived-in-it;-and having offered to the sun, the divine luminary, the-gem-of-one-circle-of-heaven, eye-of-the-three-worlds, Lord of-the-lotos, a dish embellished-with-flowers-of-various-sorts, (this dish is filled with the plant *Darbha*, rice in the husk, different flowers, and sandal,) have granted to him, who has viewed the preceptor of the Gods and of Demons, who has adored the Sovereign Deity the-husband-of-AMBICA', (or DURGA',) has sacrificed-caused-others-to-sacrifice,-has read-caused-others-to-read-and-has-performed-the-rest-of-the-six (sacerdotal) functions; who-is-eminently-skilled-in-the-whole-business-of-performing-sacrifices, who-has-held-up the-root-and-stalk-of-the-sacred-lotos; who-inhabits-the-city-SRI ST'HA'NACA, (*or abode of Fortune,*) descended from JAMADAGNI; who-performs-due-rites-in-the-holy-stream; who-distinctly-knows-the-mysterious-branches, (of the *Védas,*) the domestic priest, the reader, SRI TICCAPAIYA, son of SRĪ CHCH'HINTAPAIYA the astronomer, for-the-purpose-of-sacrificing-causing-others to-sacrifice-reading-causing-others-to-read-and-discharging-the-rest of-the-six-(sacerdotal-) duties, of performing-the (daily service of) *Vais'wadéva* with offerings of rice, milk, and materials of sacrifice, and-of-completing-with due-solemnity the sacrifice-of-fire-of doing-such-acts-as-must-continually-be-done, and such-as-must-occasionally-be-performed, of paying-due-honours to guests and strangers, and-of-supporting his-own-family, the village of *Chávindra*-standing-at-the-extremity of-the-territory of *Vatsarája*, and the boundaries of which *are*, to the east the village of *Púagambà* and a water-fall-from a mountain ; to the south the villages of *Nágámbá* and *Múládóngaricà ;* to the west the river *Sámbarapallicà ;* to the north the villages of *Sámbivè* and *Cát'iyálaca ;* and besides this the full *(district)* of *Tócabalà Pallicà*, the boundaries of which *are* to the east, *Sídábalì ;* to the south the river *Mót'hala ;* to the west, *Cácad'éva*, *Hallapallicà*, and *Bad'aviraca;* to the north, *Talávalì Pallicà ;* and also the village of *Aulacïya*, the boundaries of which (are) to the east, *Tad'ága ;* to the south, *Góvini ;* to the west, *Charicà*, to the north, *Calibalà-yachóli :* (that land) thus surveyed-on-the-four-quarters-and limited-to-its-proper-bounds, with-its-herbage-wood-and-water, and with-power-of-punishing-for-the-ten-crimes, except that before given as the portion of *Déva*, or of *Brahmà*, I have hereby released, and limited-by-the-duration-of-the-sun-the-moon-and-mountains, confirmed with-the-ceremony-of adoration, with a copious effusion of water, and with the highest acts-of-worship ; *and the same land* shall be enjoyed by his lineal-and-collateral-heirs, or caused-to-be-enjoyed, nor shall disturbance be given by any person whatever : since it is thus declared by great *Munis.*

STANZAS.

1. The earth is enjoyed by many kings, by SA'GAR, and by others : to whomsoever the soil at any time belongs, to him at that time belong the fruits of it.

2. A speedy gift is attended with no fatigue; a continued support, with great trouble; therefore, even the *Rìshìs* declare, that a continuance of support is better than a single gift.

3. Exalted Emperors of good dispositions have given land, as RA'MABHADRA advises, again and again : this is the true bridge of justice for sovereigns : from time to time (O kings) that bridge must be repaired by you.

4. Those possessions here below, which have been granted in former times by sovereigns, given for-the-sake-of-religion-increase-of-wealth-or-of-same, are exactly equal to flowers, which have been offered to a Deity : what good man would resume *such gifts ?*

Thus, confirming the precepts of ancient *Munis*, all future kings must gather the fruit-of-observing-religious-duties ; and let not the stain-of-the crime-of- destroying-this-*grant* be borne henceforth by any-one : since, whatever *prince*, being supplicated, shall, through avarice, having-his-mind-wholly-surrounded-with-the-gloom-of-ignorance-contemptuously-dismiss-the injured-suppliant, he, being guilty of five great and *five* small crimes, shall long in darkness inhabit *Raurava*, *Mahárauravа*, *Andha*, *Támisra*, and the other places of punishment. And thus it is declared by the divine VYA'SA :

STANZAS.

1. He, who seizes land, given-by-himself or by-another (sovereign), will rot among worms, himself a worm, in the midst of ordure.

2. They, who seize granted-land, are born again, living with great fear, in dry cavities of trees in the unwatered forests on the *Vinddhian* (mountains).

3. By seizing one cow, one vesture, or even one nail's breadth of ground, *a king* continues in hell till an universal destruction of the world has happened.

4. By (a gift of) a thousand gardens, and by (a gift of) a hundred pools of water, by (giving) a hundred *lac* of oxen, a disseisor of (granted) land is not cleared from offence.

5. A grantor of land remains in heaven sixty thousand years ; a disseisor, and he, who refuses to do justice, continues as many (years) in hell.

And, agreeably to this, in what is written by the hand of the Secretary, (the King) having ordered it, declares his own intention ; as it is written by the command of me, Sovereign of the Great Circle, the fortunate ARICE'SARI DE'VARA'JA, son of the Sovereign of the Great Circle, the Fortunate, invincible, DE'VARA'JA.

And this is written, by order of the Fortunate King, by me JO'-UBA, the brother's-son-of S'RI' NA'GALAIYA,-the great-Bard,-dwelling-in-the royal palace ; engraved-on-plates-of-copper by VE'DAPAIYA'S son MANA DHA'RA PAIYA. Thus (it ends).

Whatever herein (may be) defective in-one-syllable, or have-one-syllable-redundant, all that is (nevertheless) complete evidence (of the grant.) Thus (ends the whole).

To the PRESIDENT.

DEAR SIR,

I DO myself the honor to send you a few Remarks on *Tagara*, and beg leave to submit them to your judgment: inquiries of that kind are generally very dry; and unluckily I have no talent for amplification. I have collected all I could find in the ancient authors, and endeavoured, by bringing the whole together, to elucidate a subject, which must be interesting to the ASIATIC SOCIETY; and this, I hope, will secure me their indulgence. I have been as sparing as possible of *Greek* quotations: I am not fond of them; however, I have ventured a few, which I thought absolutely necessary. With respect to the historical part, you will find I am not conversant with the *Hindu* antiquities: indeed, I have no time to study languages.

I am,

DEAR SIR,

Your most obedient humble Servent,

F. WILFORD.

Russapugla, June 10, 1787.

REMARKS ON THE CITY OF TAGARA.

By LIEUTENANT FRANCIS WILFORD.

THE expedition of ALEXANDER having made the *Greeks* acquainted with the riches of *India*, they soon discovered the way by sea into that country, and, having entered into a commercial correspondence with the natives, they found it so beneficial, that they attempted a trade thither.

PTOLEMY PHILADELPHUS, king of *Egypt*, in order to render the means easy to merchants, sent one DIONYSIUS into the Southern parts of *India*, to inquire into the nature of that country, its produce, and manufactures.

It was then *Tagara* began to be known to the *Greeks*, about 2050 years ago.

ARRIAN, in his *Periplus Maris Erythræi*, says it was a very large city, and that the produce of the country, at that early period, consisted chiefly of coarse *Dungarees (Othonium vulgare)*, of which vast quantities were exported; muslins of all sorts, *(Sindones omnis generis)*, and a kind of cotton stuff, dyed of a whitish purple, and very much of the colour of the flowers of mallows, whence called *Molochyna*.

All kinds of mercantile goods throughout the *Deccan*, were brought to *Tagara*, and from thence conveyed on carts to *Baroach*, *(Barygaza)*.

ARRIAN informs us, that *Tagara* was about ten days' journey to the eastward of another famous mart, called *Plithana*, or *Plúthana*.

That *Plúthana* was twenty days' journey to the southward of *Baroach*; Also,

That the road was through the *Balagaut* mountains.

And here we must observe, that the *Latin* translation of the *Periplus* * by STUCKIUS is very inaccurate and often erroneous; as in the following passage, where ARRIAN, speaking of *Tagara*, says

* Geographiæ veteris Scriptores Græci minores. Vol. I.

"Κατάγεται δὲ ἐξ αὐτῶν πορείαις ἁμαξῶν καὶ ἀνοδίαις μεγίσταις εἰς τὴν Βαρύγαζαν.
which STUCKIUS translates thus,
"Ex his autem emporiis, *per loca invia et difficillima, res* Barygazam
"plaustris *convehuntur*."

But it should be,
"Ex his autem emporiis, *per maximos ascensus*, res Barygazam
"*deorsum feruntur*."

Κατάγω signifies *deorsum ferre*, (to bring down,) not *convehere*.

Ανοδίαι μεγίσται should be translated *per maximos ascensus*. Ανοδία, or ἄνοδος, in this place, signifies *an ascent, a road over hills*; and this meaning is plainly pointed out by the words κατάγεται and μεγίσταις.

In short, ἀνοδίαι μεγίσται is the true translation of the *Hindoo* word *Bala-gaut*, the name of the mountains through which the goods from *Tagara* to *Baroach* used to be conveyed.

This passage in ARRIAN is the more interesting, as it fixes the time when the *Bala-gaut* mountains were first heard of in *Europe*.

The bearing from *Tagara* to *Pluthana* is expressly mentioned by ARRIAN (πρὸς ἀνατολὴν) but is left out by STUCKIUS.

Pluthana is an important point to be settled, as it regulates the situation of *Tagara*.

It still exists, and goes nearly by the same name, being called to this day *Pultanah*. It is situated on the southern bank of the *Godávery*, about 217 British miles to the southward of *Baroach*.

These 217 miles, being divided by twenty, the number of days travellers were between *Pultanah* and *Baroach*, according to ARRIAN, give nearly eleven miles per day or five coss, which is the usual rate of travelling with heavy loaded carts.

The Onyx, and several other precious stones, are still found in the neighbourhood of *Pultanah*, as related by ARRIAN; being washed down by torrents from the hills during the rains, according to PLINY.

ARRIAN informs us, that the famous town of *Tagara* was about ten days' journey to the eastward of *Pultanah*.

According to the above proportion, these ten days (or rather somewhat less*) are equal to about 100 British miles; and conse-

* Ὡς ἡμερῶν δέκα quasi dies decem.

quently *Tagara*, by its bearing and distance from *Pultanah*, falls at *Deoghir*, a place of great antiquity, and famous through all *India* on account of the *Pagodas* of *Eloura*. It is now called *Doulet-abad* and about four coss N. W. of *Aurungabad*.

PTOLEMY agrees very well with ARRIAN, with respect to distances and bearings, if we admit that he has mistaken *Baithana* or *Paithana* for *Plithana*; and this, I am pretty sure, is really the case, and may be easily accounted for, as there is very little difference between ΠΛΙΘΑΝΑ and ΠΑΙΘΑΝΑ in the *Greek* character.

Paithana, now *Pattan* * or *Putten*, is about half way between *Tagara* and *Plithana*.

According to PTOLEMY, *Tagara* and *Pattan* were situated to the northward of the Baund-Ganga (*Binda or Bynda* river,) commonly called *Goda'very*; and here PTOLEMY is very right.

In Mr. BUSSY'S *marches*, *Pattan* is placed to the southward of the *Goda'very*; but it is a mistake.

It appears from ARRIAN'S *Periplus*, that, on the arrival of the *Greeks* into the *Deccan*, above 2000 years ago, *Tagara* was the *metropolis* of a large district called *Ariaca*, which comprehended the greatest part of Subah *Aurangabad* and the southern part of *Concan*; for the northern part of that district, including *Damaun*, *Callian*, the Island of *Salset*, *Bombay*, &c. belonged to the *Rajah* of *Larikeh* or *Lar*, according to ARRIAN and EBN SAÏD AL MAGREBI.

It is necessary to observe here, that, though the author of the *Periplus* is supposed to have lived about the year 160 of the present era, yet the materials, he made use of in compiling his directory, are far more ancient: for, in speaking of *Tagara*, he says that the *Greeks* were prohibited from landing at *Callian*, and other harbours on that coast. Now it is well known, that, after the conquest of *Egypt*, the *Romans* had monopolised the whole trade to *India*, and would allow no foreigner to enter the Red Sea; and consequently this passage has reference to an earlier period, previous to the conquest of *Egypt* by the *Romans*.

About the middle of the first century, *Tagara* was no longer the capital of *Ariaca*, *Rajah* SALBAHAN having removed the seat of the empire to *Pattan*.

* *Patinæ* Tab. Peutinger. *Patinna* Anonym. Ravenn.

PTOLEMY informs us, that *Paithana*, or *Pattan*, had been the residence of a prince of that country, whose name the *Greeks* have strangely disfigured: we find it variously spelt, in different MSS. of PTOLEMY, *Siripolemœus*, *Siropolemœus*, *Siroptolemœus*, *&c.*

Yet, when we consider that, whenever *Pattan* is mentioned by the *Hindoos*, they generally add, it was the residence of *Rajah* SALBAHAN*, who, in the dialect of the *Deccan*, is called *Salivanam*, or *Salibanam*, I cannot help thinking that the *Greeks* have disfigured this last word *Salibanam* into *Saripalam*, from which they have made *Siripolemœus*, *Siropolemœus*, *&c.*

BICKRAMAJIT ruled for some time over the northern parts of the *Deccan*; but the *Rajahs*, headed by SALBAHAN, having revolted, they gave him battle, and he was slain. *Tagara* became again the *Metropolis* of *Ariaca*; at least it was so towards the latter end of the eleventh century, as it appears from a grant of some lands in *Concan*, made by a *Rajah* of *Tagara*: this grant still exists, and was communicated to the ASIATIC SOCIETY by General CARNAC.

When the *Mussulmans* carried their arms into the *Deccan* about the year 1293, *Tagara* or *Deoghir* was still the residence of a powerful *Rajah*, and remained so till the time of SHAH-JEHAN, when the district belonging to it became a *Subah* of the *Mogul* Empire. Then *Tagara* was deserted; and *Kerkhi*, four coss to the south-east of it, became the capital. This place is now called *Aurungabad.*

Thus was destroyed the ancient kingdom or *Rajaship* of *Tagara*, after it had existed with little interruption above 2000 years; that is to say, as far as we can trace back its antiquity.

It may appear astonishing, that, though the *Rajah* of *Tagara* was possessed of a large tract on the sea coast, yet all the trade was carried on by land.

Formerly it was not so. On the arrival of the *Greeks* into the *Deccan*, goods were brought to *Callian*, near *Bombay*, and then shipped off. However, a *Rajah* of *Larikeh* or *Lar*, called *Sandanes*, according to ARRIAN, would no longer allow the *Greeks* to trade either at *Callian* or at the harbours belonging to him on that coast, except *Baroach*; and whenever any of them were found at *Callian*, or in

* Making use of the very words of Ptolemy.

the neighbourhood, they were confined, and sent to *Baroach* under a strong guard. ARRIAN, being a *Greek* himself, has not thought proper to inform us, what could induce the *Rajah* to behave in this manner to the *Greeks*; but his silence is a convincing proof that they had behaved amiss; and it is likely enough, they had attempted to make a settlement in the Island of *Salset*, in order to make themselves independent and facilitate their conquests into the *Deccan.*

The fears of the *Rajah* were not groundless; for the *Greek* kings of *Bactriana* were possessed of the *Punjab*, *Cabul*, &c. in the north of *India.*

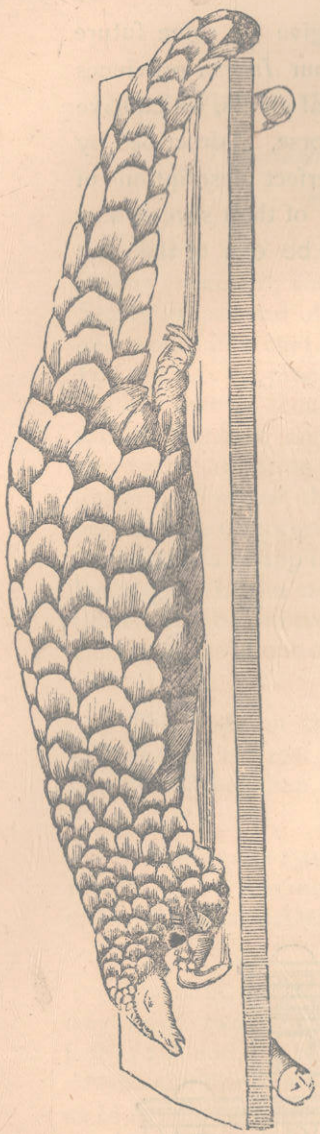
There were other harbours, to the south of *Callian*, belonging to the *Rajah* of *Tagara*, but they were not frequented, on account of *pirates*, who, according to PLINY, ARRIAN and PTOLEMY, infested these countries, in the very same manner they do now.

XX.

On the PANGOLIN of BAHAR.

Sent by MATTHEW LESLIE, Esq.

THE singular animal, which M. BUFFON describes by the name of *Pangolin*, is well known in *Europe* since the publication of his Natural History, and GOLDSMITH'S elegant abridgment of it; but, if the figure exhibited by BUFFON was accurately delineated from the three animals, the spoils of which he had examined, we must consider that, which has been lately brought from *Caracdíah* to *Chitra*, and sent thence to the Presidency, as a remrkable variety, if not a different species, of the *Pangolin*. Ours has hardly any neck, and, though some filaments are discernible between the scales, they can scarce be called bristles; but the principal difference is in the tail; that of BUFFON'S animal being long, and tapering almost to a point, while that of ours is much shorter, ends obtusely, and resembles in form and flexibility the tail of a lobster. In other respects, as far as we can judge from the dead subject, it has all the characters of BUFFON'S *Pangolin;* a name derived from that by which the animal is distinguished in *Java*, and consequently preferable to *Manis* or *Pholidótus*, or any other appellation deduced from an *European* language. As to the *scaly lizard*, the *scaled armadillo*, and the *five-nailed ant-eater*, they are manifestly improper designations of this animal; which is neither a *lizard*, nor an *armadillo*, in the common acceptation; and, though it be an *ant-eater*, yet it essentially differs from the *hairy* quadruped usually known by that general description. We are told that the *Malabar* name of this animal is *Alungu*. The natives of *Bahar* call it *Vajra-kit*, or, as they explain the word, *stone-vermine;* and in the stomach of the animal before us was found about a teacupful of small *stones*, which had probably been swallowed for the purpose of facilitating digestion; but the name alludes, I believe, to the *hardness* of the scales; for *vajrakít'a* means, in *Sanscrit*, the *diamond*, or *thunderbolt reptile;* and *vajra* is a common figure in the *Indian* poetry for any thing excessively *hard*. The *vajrakít'a* is believed by the *Pandits* to be the animal which gnaws their *sacred stone*, called *Sálgrámas'ilà;*

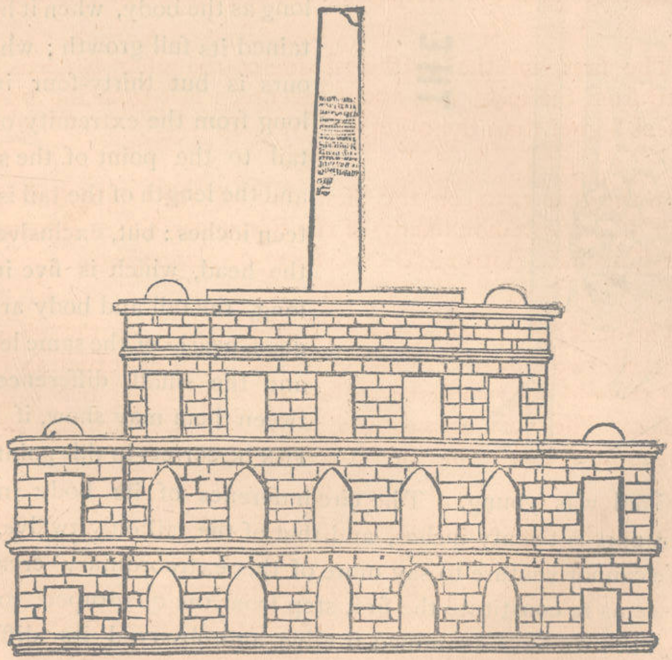


THE VAJRAKÍTA

but the *pangolin* has apparently no teeth, and the *sálgráms*, many of which look as if they had been worm-eaten, are perhaps only decayed in part by exposure to the air.

This animal had a long tongue shaped like that of a cameleon; and, if it was nearly adult, as we may conclude from the young one found in it, the dimensions of it were much less than those which BUFFON assigns *generally* to his *pangolin;* for he describes its length as six, seven, or eight feet, including the tail, which is almost, he says, as long as the body, when it has attained its full growth; whereas ours is but thirty-four inches long from the extremity of the tail to the point of the snout, and the length of the tail is fourteen inches: but, exclusively of the head, which is five inches long, the tail and body are, indeed, nearly of the same length; and the small difference between them may show, if BUFFON be correct in this point, that the animal was young. The circumference of its body in the thickest part is twenty inches, and that of the tail only twelve.

We cannot venture to say more of this extraordinary creature, which seems to constitute the first step from the quadruped to the reptile, until we have examined it alive, and observed its different instincts; but as we are assured that it is common in the conntry round *Khánpùr*, and at *Chátigám*, where the native *Muselmans* call it the *land-carp*, we shall possibly be able to give on some future occasion a fuller account of it. There are in our *Indian* provinces many animals, and many hundreds of medicinal plants, which have either not been described at all, or, what is worse, ill described by the naturalists of *Europe;* and, to procure perfect descriptions of them from actual examination, with accounts of their several *uses* in medicine, diet, or manufactures, appears to be one of the most important objects of our institution.



THE STAFF OF FÍRÚZ SHÁH.

XXI.

INSCRIPTIONS ON THE STAFF OF FI'RU'Z SHAH.

Translated from the Sanscrit, as explained by

RA'DHA'CA'NTA SARMAN.

ON a very singular monument near *Delhi,* an outline of which is here exhibited, and which the natives call the Staff of FI'RU'Z SHAH, are several old inscriptions partly in ancient *Nágarì* letters, and partly in a character yet unknown; and Lieutenant Colonel POLIER, having procured exact impressions of them, presents the Society with an accurate Copy of all the Inscriptions. Five of them are in *Sanscrit,* and, for the most part, intelligible; but it will require great attention and leisure to decypher the others, If the language be *Sanscrit,* the powers of the unknown letters may, perhaps, hereafter be discovered by the usual mode of decyphering; and that mode, carefully applied even at first, may lead to a discovery of the language. In the mean time, a literal version of the legible Inscriptions is laid before you. They are, on the whole, sufficiently clear; but the sense of one or two passages is at present inexplicable.

I.

The first, on the southwest side of the pillar, is perfectly detached from the rest: it is about seventeen feet from the base, and two feet higher than the other inscriptions.

O'M.

In the year 1230, on the first day of the bright half of the month *Vaisác'h* (a monument) of the Fortunate-VI'SALA-DE'VA-son-of-the-Fortunate-AMILLA-DE'VA,-King-of-*Sácambharì.*

II.

The next, which is engraved as a specimen of the character, consists of two stanzas in four lines; but each hemistich is imperfect at the end, the two first wanting *seven,* and the two last *five,* syllables. The word *Sácambharì* in the former inscription enables us to supply the close of the *third* hemistich.

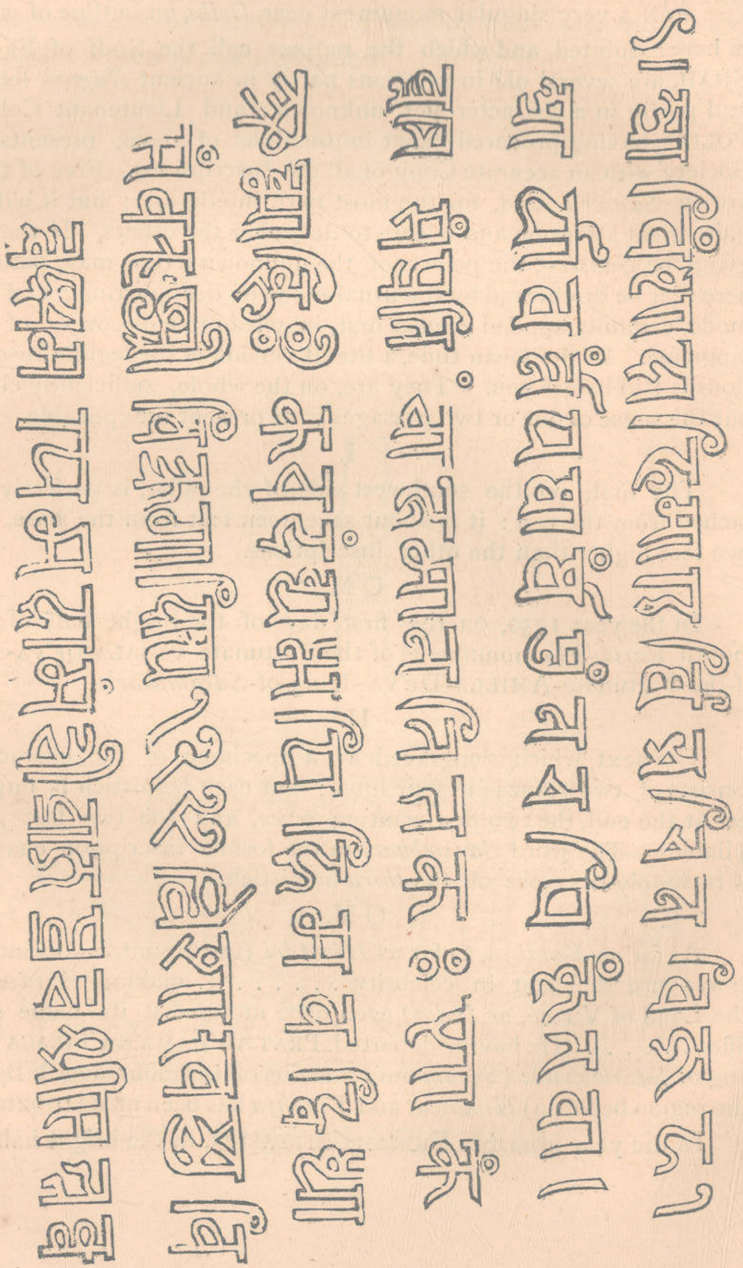
O'M.

As far as *Vindhya,* as far as *Himádri,* (the Mountain of Snow,) he was not deficient in celebrity . . . . making *Aryáverta* (the Land of Virtue, *or India)* even once more what its name signifies . . . . . . He having departed, PRATIVA'HAMA'NA TILACA (is) king of *Sácambharì:* (*Sácam* only remains on the monument.) By us (the region between) *Himawat* and *Vindhya* has been made tributary.

In the year from *Srì* VICRAMA'DITYA 123, in the bright half of the month *Vaisác'h* . . . . at that time the *Rájaputra Srì* SALLACA was Prime Minister.

The second stanza, supplied partly from the last inscription, and partly by conjecture, will run thus:

vritté sa prativáhamána tilacah s'ácambharíbhúpatih
asmábhih caradam vyadháyi himawadvindhyátavímand'alam.



The date 123 is here perfectly clear; at least it is clear that only *three* figures are written, without even room for a cypher after them; whence we may guess that the double circle in the former inscription was only an ornament, or the neutral termination *am:* if so, the date of *both* is the year of CHRIST *sixty-seven*; but if the double circle be a *Zero*, the monument of VI'SALA DE'VA is as modern as the year 1174, or *nineteen* years before the conquest of *Delhi* by SHIHA'BU'DDI'N.

III and IV.

The two next inscriptions were in the same words, but the stanzas, which in the fourth are extremely mutilated, are tolerably perfect in the third, wanting only a few syllables at the beginning of the hemistichs:

yah cshívéshu prahartá nripatishu vinamatcandharéshu prasannah
—vah s'ambi puríndrah jagati vijayatè vísala cshónipálah
. . . da sájnya ésha vijayì santánajánátmajah
. . púnán cshemástu bruvatamudyógas'únyanmanah

He who is resentful to kings intoxicated with pride, indulgent to those whose necks are humbled, an INDRA in the city of *Causámbi*, (I suspect *Causámbi*, a city near *Hastinápur*, to be the true reading,) *who* is victorious in the world, VI'SALA, sovereign of the earth: he gives . . . . his commands being obeyed, he is a conqueror, the son of SANTA'NAJA'NA, whose mind, when his foes say, 'Let there be mercy,' is free from further hostility.

This inscription was engraved, in the presence of SRI' TILACA RA'JA, by SRI'PATI, the son of MA'HAVA, a *Cáyast'ha*, of a family in *Gaud'a*, or *Bengal*.

V.

The fifth seems to be an elegy on the death of a king named VIGRAHA, who is represented as only slumbering. The last hemistich is hardly legible, and very obscure; but the sense of both stanzas appears to be this.

O'M.

1. An offence to the eyes of (thy) enemy's consort (thou) by-whom-fortune-was-given-to-every suppliant, thy fame, joined to extensive dominion, shines, as we desire, before us. The heart of (thy) foes was vacant, even as a path in a desert, where men are hindred from passing, O fortunate VIGRAHA RA'JADE'VA, in the jubilee occasioned by thy march.

2. May thy abode, O VIGRAHA, sovereign of the world, be fixed, as in reason, (it ought) in the bosoms, embellished with love's allurements, and full of dignity, of the women with beautiful eyebrows, who were married to thy enemies! Whether thou art INDRA, or VISHNU, or SIVA, there is even no deciding: thy foes (are) fallen, like descending water. Oh! why dost thou through delusion, continue sleeping?

XXII.

A CONVERSATION WITH ABRAM, AN ABYSSINIAN

Concerning the CITY of GWENDER

AND THE SOURCES OF THE NILE.

BY THE PRESIDENT.

HAVING been informed, that a native of *Abyssinia* was in *Calcutta*, who spoke *Arabic* with tolerable fluency, I sent for and examined him attentively on several subjects, with which he seemed likely to be acquainted. His answers were so simple and precise, and his whole demeanour so remote from any suspicion of falsehood, that I made a minute of his examination, which may not perhaps be unacceptable to the Society. *Gwender*, which BERNIER had long ago pronounced a *capital city*, though LUDOLF asserted it to be only a *military station*, and conjectured, that in a few years it would wholly disappear, is certainly, according to ABRAM, the *Metropolis* of *Abyssinia*. He says, that it is nearly as large and as populous as *Misr*, or *Káhera*, which he saw on his pilgrimage to *Jerusalem*; that it lies between two broad and deep rivers, named *Caha* and *Ancrib*, both which slow into the *Nile* at the distance of about fifteen days' journey; that all the walls of the houses are of a red stone, and the roofs of thatch; that the streets are like those of *Calcutta*, but that the ways, by which the king passes, are very spacious; that the palace, which has a plaistered roof, resembles a fortress, and stands in the heart of the city; that the markets of the town abound in pulse, and have also wheat and barley, but no rice; that sheep and goats are in plenty among them, and that the inhabitants are extremely fond of milk, cheese, and whey; but that *the country people* and *soldiery* make no scruple of drinking the blood, and eating the raw flesh, of an ox, which they cut without caring whether he is dead or alive; that this savage diet is, however, by no means general. Almonds, he says, and dates are not found in his country; but grapes and peaches ripen there; and in some of the distant provinces, especially at *Cárudár*, wine is made in abundance; but a kind of mead is the common inebriating liquor of the *Abyssinians*. The late king was *Tilca Mahút*, (the first of which

words means *root* or *origin*;) and the present, his brother, *Tilca Jerjis*. He represents the royal forces at *Gwender* as considerable; and asserts, perhaps at random, that near forty thousand horse are in that station. The troops are armed, he says, with muskets, lances, bows and arrows, cimeters, and hangers. The council of state consists, by his account, of about forty ministers, to whom almost all the executive part of government is committed. He was once in the service of a *Vazir*, in whose train he went to see the fountains of the *Nile* or *Abey*, usually called *Alwey*, about eight days' journey from *Gwender*. He saw three springs, one of which rises from the ground with a great noise, that may be heard at the distance of five or six miles. I showed him the description of the *Nile* by GREGORY of *Amhara*, which LUDOLF has printed in *Ethiopic*. He both read and explained it with great facility; whilst I compared his explanation with the *Latin* version, and found it perfectly exact. He asserted of his own accord, that the description was conformable to all that he had seen and heard in *Ethiopia*; and for that reason I annex it. When I interrogated him on the languages and learning of his country, he answered, that six or seven tongues at least were spoken there; that the most elegant idiom, which the king used, was the *Amharic*; that the *Ethiopic* contained, as it is well known, many *Arabic* words; that, besides, their sacred books, as the prophecy of ENOCH, and others, they had Histories of *Abyssinia*, and various literary compositions; that their language was taught in schools and colleges, of which there were several in the metropolis. He said, that no *Abyssinian* doubted the existence of the royal prison called *Wahinin*, situated on a very lofty mountain, in which the sons and daughters of their kings were confined; but that, from the nature of the thing, a particular description of it could not be obtained. "All these matters, said "he, are explained, I suppose, in the writings of YA'KU'B, whom I "saw thirteen years ago in *Gwender*. He was a physician, and "had attended the king's brother, who was also a *Vazir*, in his last "illness. The prince died; yet the king loved YA'KU'B, and, indeed, all the court and people loved him. The king received "him in his palace as a guest, supplied him with every thing, that "he could want; and, when he went to see the sources of the "*Nile* and other curiosities, (for he was extremely curious,) he re-

"ceived every possible assistance and accommodation from the "royal favour. He understood the languages, and wrote and col- "lected many books, which he carried with him." It was impossible for me to doubt, (especially when he described the person of YA´KU´B,) that he meant JAMES BRUCE, Esq. who travelled in the dress of a *Syrian* physician, and probably assumed with judgment a name well known in *Abyssinia*. He is still revered on *Mount Sinai* for his sagacity in discovering a spring, of which the monastery was in great need; he was known at *Jedda* by MI´R MOHAMMED HUSSAIN, one of the most intelligent *Mahomedans* in *India*; and I have seen him mentioned with great regard in a letter from an *Arabian* merchant at *Mokhá*. It is probable that he entered *Abyssinia* by the way of *Musuwwa*, a town in the possession of the *Muselmans*, and returned through the desert mentioned by GREGORY in his description of the *Nile*. We may hope that Mr. BRUCE will publish an account of his interesting travels, with a version of the book of ENOCH, which no man but himself can give us with fidelity. By the help of *Abyssinian* records, great light may be thrown on the History of *Yemen* before the time of MUHAMMED; since it is generally known, that four *Ethiop* kings successively reigned in that country, having been invited over by the natives to oppose the tyrant DHU NAWA´S; and that they were, in their turn, expelled by the arms of the *Himyaric* Princes, with the aid of ANUSHIRVAN, king of *Persia*, who did not fail, as it usually happens, to keep in subjection the people whom he had consented to relieve. If the annals of this period can be restored, it must be through the histories of *Abyssinia*, which will also correct the many errors of the best *Asiatic* writers on the *Nile*, and the countries which it fertilizes.

ON THE COURSE OF THE NILE.

THE *Nile*, which the *Abyssinians* know by the names of *Abéy* and *Alawy*, or the *Giant*, gushes from several springs at a place called *Sucút*, lying on the highest part of *Dengalá*, near *Gojjám*, to the west of *Bajemdir*, and the lake of *Dara* or *Wed*; into which it runs with so strong and rapid a current, that it mixes not with the other waters, but rides or swims, as it were, above them.

All the rains that fall in *Abyssinia* and descend in torrents from the hills, all streams and rivers, small and great, except the *Hanázó*, which washes the plains of *Hengót*, and the *Hawásh*, which flows by *Dewár* and *Fetgár*, are collected by this king of waters, and, like vassals, attend his march. Thus enforced, he rushes, like a hero exulting in his strength, and hastens to fertilize the land of *Egypt*, on which no rain falls. We must except also those *Ethiopian* rivers, which rise in countries bordering on the ocean, as the kingdoms of *Cambát*, *Gurájy*, *Wásy*, *Náriyah*, *Gásy*, *Wej*, and *Zinjiro*, whose waters are disembogued into the sea.

When the *Alawy* has passed the Lake, it proceeds between *Gojjám* and *Bajemdir*, and, leaving them to the west and east, pursues a direct course towards *Amhárá*, the skirts of which it bathes, and then turns again to the west, touching the borders of *Walaka*; whence it rolls along *Múgár* and *Shawai*, and, passing *Bazáwá* and *Gongá*, descends into the lowlands of *Shankila*, the country of the Blacks: thus it forms a sort of spiral round the province of *Gojjám*, which it keeps for the most part on its right.

Here it bends a little to the east, from which quarter, before it reaches the districts of *Sennár*, it receives two large rivers, one called *Tacazzy*, which runs from *Tegri*; and the other, *Gwangue*, which comes from *Dembeiá*.

After it has visited *Sennár*, it washes the land of *Dongolá*, and proceeds thence to *Nubia*, where it again turns eastward, and reaches a country named *Abrim*, where no vessels can be navigated, by reason of the rocks and crags which obstruct the channel. The inhabitants of *Sennár* and *Nubia* may constantly drink of its water, which lies to the east of them like a strong bulwark; but the merchants of *Abyssinia*, who travel to *Egypt*, leave the *Nile* on their right, as soon as they have passed *Nubia*, and are obliged to traverse a desert of sand and gravel, in which for fifteen days they find neither wood nor water. They meet it again in the country of *Reif* or *Upper Egypt*, where they find boats on the river, or ride on its banks, refreshing themselves with its salutary streams.

It is asserted by some travellers, that, when the *Alawy* has passed *Sennár* and *Dongolá*, but before it enters *Nubia*, it divides itself; that the great body of water flows entire into *Egypt*, where the smaller branch (the *Niger)* runs westward, not so as to reach *Barbary*, but towards the country of *Alwáh*, whence it rushes into the great sea. The truth of this fact I have verified, partly by my own observation, and partly by my inquiries among intelligent men; whose answers seemed the more credible, because, if so prodigious a mass of water were to roll over *Egypt* with all its wintry increase, not the land only, but the houses and towns, of the *Egyptians* must be overflowed.

XXIII.

On the TRIAL by ORDEAL, among the HINDUS.

By ALI' IBRA'HI'M KHA'N,

CHIEF MAGISTRATE AT BANA'RES.

Communicated by WARREN HASTINGS, Esq.

THE modes of trying offenders by an appeal to the Deity, which are described at large in the *Mitácsherá*, or comment on the *Dherma Sástra*, in the *Chapter of Oaths*, and other ancient books of *Hindu* law, are here sufficiently explained, according to the interpretation of learned *Pandits*, by the well-wisher to mankind, Ali' Ibra'hi'm Kha'n.

The word *Divya*, in *Sanscrit*, signifies the same with *Paricshà*, or *Parikhyà* in *Bhásha*, *Kasam* in *Arabic*, and *Saucand* in *Persian*; that is, an *oath*; or the form of invoking the Supreme Being to attest the truth of an allegation; but it is generally understood to mean the trial by *ordeal*, or the form of appealing to the *immediate* interposition of the Divine Power.

Now this trial may be conducted in *nine* ways. First, by the *balance*; secondly, by *fire*; thirdly, by *water*; fourthly, by *poison*; fifthly, by the *Cósha*, or water in which an idol has been washed; sixthly, by *rice*; seventhly, by *boiling oil*; eighthly, by *red-hot iron*; ninthly, by *images*.

I. Ordeal by *the balance* is thus performed. The beam having been previously adjusted, the cord fixed, and both scales made perfectly even, the person accused and a *Pandit* fast a whole day; then, after the accused has been bathed in sacred water, the *hóma*, or *oblation*, presented to *fire*, and the deities worshipped, he is carefully weighed; and, when he is taken out of the scale, the *Pandits* prostrate themselves before it, pronounce a certain *mentra*, or *incantation*, agreeably to the *Sástras*, and, having written the substance of the accusation on a piece of paper, bind it on his head. Six minutes after they place him again in the scale; and if he weigh more than before, he is held guilty; if less, innocent; if exactly the same, he must be weighed a third time; when, as it is written in the *Mitácsherá*, there will certainly be a difference in his weight

Should the balance, though well fixed, break down, this would be considered as a proof of his guilt.

II. For the *fire-ordeal* an excavation, nine hands long, two spans broad, and one span deep, is made in the ground, and filled with a fire of *pippal wood:* into this the person accused must walk bare-footed ; and if his foot be unhurt, they hold him blameless ; if burned, guilty.

III. *Water-ordeal* is performed by causing the person accused to stand in a sufficient depth of water, either flowing or stagnant, to reach his navel ; but care should be taken that no ravenous animal be in it, and that it be not moved by much air : a *Bráhman* is then directed to go into the water, holding a staff in his hand ; and a soldier shoots three arrows on dry ground from a bow of cane : a man is next dispatched to bring the arrow which has been shot farthest ; and, after he has taken it up, another is ordered to run from the edge of the water ; at which instant the person accused is told to grasp the foot or the staff of the *Bráhman*, who stands near him in the water, and immediately to dive into it. He must remain under water till the two men who went to fetch the arrows are returned ; for if he raise his head or body above the surface, before the arrows are brought back, his guilt is considered as fully proved. In the villages near *Benáres*, it is the practice for the person, who is to be tried by this kind of *ordeal*, to stand in water up to his navel, and then, holding the foot of a *Bráhman*, to dive under it as long as a man can walk fifty paces very gently. If before the man has walked thus far the accused rise above the water, he is condemned ; if not, acquitted.

IV. There are two sorts of trial by *poison*. First, the *Pandits* having performed their *hóma*, and the person accused his ablution, two *rettis* and a half, or seven barley-corns, of *vishanága*, a poisonous root, or of *sanc'hyà*, (that is, white arsenic,) are mixed in eight *máshas*, or sixty-four *rettis*, of clarified *butter*, which the accused must eat from the hand of a *Bráhman:* if the poison produce no visible effect, he is absolved ; otherwise, condemned. Secondly, the hooded snake, called *nága*, is thrown into a deep earthen pot, into which is dropped a ring, a seal, or a coin : this the person accused is ordered to take out with his hand ; and if the serpent bite him, he is pronounced guilty ; if not, innocent.

V. Trial by the *Cósha* is as follows. The accused is made to drink three draughts of the water in which the images of the *Sun*, of *Dévì*, and other Deities, have been washed for that purpose ; and if within fourteen days he has any sickness or indisposition, his crime is considered as proved.

VI. When several persons are suspected of theft, some dry rice is weighed with the sacred stone, called *sálgrám;* or certain *slócas* are read over it ; after which the suspected persons are severally ordered to chew a quantity of it : as soon as they have chewed it, they are to throw it on some leaves of *pippal*, or, if none be at hand, on some *bhúrja patra*, or bark of a tree from *Népál* or *Cashmír.* The man from whose mouth the rice comes dry, or stained with blood, is holden guilty ; the rest are acquitted.

VII. The ordeal by *hot oil* is very simple : when it is heated sufficiently, the accused thrusts his hand into it ; and if he be not burned, is held innocent.

VIII. In the same manner, they make an *iron ball*, or the *head of a lance*, red-hot, and place it in the hands of the person accused ; who, if it burn him not, is judged guiltless.

IX. To perform the ordeal by *dharmárch*, which is the name of the *slóca* appropriated to this mode of trial, either an image, named *Dharma*, or the Genius of Justice, is made of silver, and another, called *Adharma*, of clay or iron, both of which are thrown into a large earthen jar, and the accused, having thrust his hand into it, is acquitted if he bring out the silver image, but condemned if he draw forth the iron. Or, the figure of a deity is painted on white cloth, and another on black ; the first of which they named *Dharma*, and the second *Adharma:* these are severally rolled up in cow-dung, and thrown into a large jar, without having ever been shown to the accused ; who must put his hand into the jar, and is acquitted or convicted, as he draws out the figure on white or on black cloth.

It is written in the comment on the *Dherma Sástra*, that each of the four principal casts has a sort of ordeal appropriated to it ; that a *Bráhman* must be tried by the *balance*, a *Cshatriya* by *fire*, a *Vaisya* by *water*, and a *Súdra* by *poison:* but some have decided that any ordeal, except that by poison, may be performed by a *Bráhman*, and that a man of any cast may be tried by the *balance.* It has been determined, that a woman may have any trial except those by poison and by water.

Certain months and days also are limited in the *Mitácsherá* for the different species of ordeal; as *Agrahan, Paush, Mágh, Phálgun, Sráwan*, and *Bhádra*, for that by *fire; Aswin, Cártic, Jaishta*, and *Ashá'dh*, for that by *water; Paush, Mágh*, and *Phálgun*, for that by *poison*; and regularly there should be no *water*-ordeal on the *Ashtemi*, or *eighth*, the *Cheturdasí*, or *fourteenth*, day of the new or full moon, in the intercalary month, in the month of *Bhádra*, on *Sanaischer*, or *Saturday*, and on *Mangal*, or *Twesday*: but, whenever the magistrate decides that there shall be an ordeal, the regular appointment of months and days needs not be regarded.

The *Mitácsherá* contains also the following distinctions: in cases of theft or fraud to the amount of a *hundred* gold mohrs, the trial by *poison* is proper; if *eighty* mohrs be stolen, the suspected person may be tried by *fire*; if *forty*, by the *balance*; if from *thirty* to *ten*, by the *image-water*; if two only, by *rice*.

An inspired legislator, named *Cátyáyana*, was of opinion, that, though a theft or fraud could be proved by witnesses, the party accused might be tried by ordeal. He says too, that, where a thousand *panas* are stolen or fraudulently with-held, the proper trial is by *poison*; where *seven hundred* and *fifty*, by *fire*; where *six hundred* and *sixty-six*, and a fraction, by *water*; where *five hundred*, by the *balance*; where *four* hundred, by *hot oil*; where *three* hundred, by *rice*; where an *hundred* and *fifty*, by the *Cósha*; and where *one* hundred, by the *dharmárch*, or images of silver and iron.

The mode of conducting the ordeal by red hot *balls*, or *heads of spears*, is thus particularly described in the commentary on *Yágyawelcya*.

At day-break the place where the ceremony is to be performed is cleared and washed in the customary form; and at sun-rise, the *Pandits* having paid their adoration to GANESA, the God of Wisdom, draw nine circles on the ground with cow-dung, at intervals of sixteen fingers; each circle containing sixteen fingers of earth, but the ninth either smaller or larger than the rest. Then they worship the deities in the mode prescribed by the *Sástra*, present oblations to the fire, and, having a second time worshipped the Gods, read the appointed *mentras*. The person to be tried then performs an ablution, puts on moist clothes, and, turning his face to the east, stands in the *first* ring, with both his hands fixed in his girdle.

After this the presiding magistrate and *Pandits* order him to rub some rice in the husk between his hands, which they carefully inspect; and, if the scar of a former wound, a mole, or other mark appear on either of them, they stain it with a dye, that, after the trial, it may be distinguished from any new mark. They next order him to hold both his hands open and close together; and, having put into them seven leaves of the *trembling* tree, or *pippal*, seven of the *sami* or *jend*, seven blades of *darbha* grass, a little barley moistened with curds, and a few flowers, they fasten the leaves on his hand with seven threads of raw cotton. The *Pandits* then read the *slócas* which are appointed for the occasion; and, having written a state of the case and the point in issue on a Palmyra-leaf, together with the *mentra* prescribed in the *Véda*, they tie the leaf on the head of the accused. All being prepared, they heat an iron ball or the head of a lance, weighing two *sér* and a half, or five *pounds*, and throw it into water; they heat it again, and again cool it in the same manner: the third time they keep it in the fire till it is red hot; then they make the person accused stand in the first circle; and, having taken the iron from the fire, and read the usual incantation over it, the *Pandits* place it with tongs in his hands. He must step gradually from circle to circle, his feet being constantly within one of them, and, when he has reached the *eighth*, he must throw the iron into the *ninth*, so as to burn some grass, which must be left in it for that purpose. This being performed, the magistrate and *Pandits* again command him to rub some rice in the husk between both his hands, which they afterwards examine; and if any mark of burning appear on either of them, he is convicted; if not, his innocence is considered as proved. If his hand shake through fear, and by his trembling any other part of his body is burned, his veracity remains unimpeached; but, if he let the iron drop before he reach the *eighth* circle, and doubt arise in the minds of the spectators, whether it had burned him, he must repeat the whole ceremony from the beginning.

In the year of the MESSIAH 1783, a man was tried by the *hot ball* at *Benáres*, in the presence of me ALI´ IBRA'HI´M KHA'N, on the following occasion. A man had appealed one SANCAR of larceny, who pleaded that he was not guilty; and as the theft could not be proved by legal evidence, the trial by fire-ordeal was tendered to the appellee, and accepted by him. This well-wisher to mankind advised the learned magistrates and *Pandits* to prevent the decision of the question by a mode not conformable to the practice of the Company's Government, and recommended an oath by the water of the *Ganges* and the leaves of *tulasi* in a little vessel of brass, or by the book of *Herivansa*, or the stone *Sálgrám*, or by the hallowed ponds or basons; all which oaths are used at *Benáres*. When the parties obstinately refused to try the issue by any one of the modes recommended, and insisted on a trial by the hot ball, the magistrates and *Pandits* of the court were ordered to gratify their wishes, and, setting aside those forms of trial in which there could be only a distant fear of death, or loss of property, as the just punishment of perjury by the sure, yet slow, judgment of heaven, to perform the ceremony of ordeal agreeably to the *Dherma Sástra;* but it was not till after mature deliberation for four months, that a regular mandate issued for a trial by the red hot ball; and this was at length granted for four reasons: first, because there was no other way of condemning or absolving the person accused; secondly, because both parties were *Hindus*, and this mode of trial was specially appointed in the *Dherma Sástra* by the ancient lawgivers; thirdly, because this ordeal is practised in the dominions of the *Hindu Rájás;* and fourthly, because it might be useful to inquire how it was possible for the heat of fire to be resisted, and for the hand that held it to avoid being burned. An order was accordingly sent to the *Pandits* of the court and of *Benáres* to this effect: "Since the parties accusing and accused are both *Hindus*, and will "not consent to any trial but that by the hot ball, let the ordeal "desired be duly performed in the manner prescribed by the *Mitá-* "*cshera*, or commentary on YA'GYAWALCYA."

When preparations were made for the trial, this well-wisher to mankind, attended by all the learned professors, by the officers of the court, the *Sipáhis* of Captain HOGAN'S battalion, and many inhabitants of *Benáres*, went to the place prepared, and endeavoured to dissuade the appellor from requiring the accused to be tried by fire, adding, "if his hand be not burned, you shall certainly be im- "prisoned." The accuser, not deterred by this menace, persisted in demanding the trial. The ceremony, therefore, was thus conducted in the presence of me ALI' IBRA'HI'M KHA'N.

The *Pandits* of the court and the city, having worshipped the God of *Knowledge*, and presented their oblation of clarified butter to the fire, formed nine circles of cow-dung on the ground; and, having bathed the appellee in the *Ganges*, brought him with his clothes wet; when to remove all suspicion of deceit, they washed his hands with pure water: then, having written a state of the case and the words of the *mentra* on a Palmyra-leaf, they tied it on his head; and put into his hands, which they opened and joined together, seven leaves of *pippal*, seven of *jend*, seven blades of *darbha* grass, a few flowers, and some barley moistened with curds, which they fastened with seven threads of raw white cotton. After this they made the iron ball red hot, and, taking it up with tongs, placed it in his hands. He walked with it, step by step, the space of three *gaz* and a half, through each of the *seven* intermediate rings, and threw the ball into the *ninth*, where it burnt the grass, that had been left in it. He next, to prove his veracity, rubbed some rice in the husk between his hands; which were afterwards examined, and were so far from being burned, that not even a blister was raised on either of them. Since it is the nature of fire to burn, the officers of the court, and people of *Benáres*, near five hundred of whom attended the ceremony, were astonished at the event; and this well-wisher to mankind was perfectly amazed. It occurred to his weak apprehension, that probably the fresh leaves, and other things, which, as it had been mentioned, were placed on the hands of the accused, had prevented their being burned; besides that the time was but short between his taking the ball and throwing it down; yet it is positively declared in the *Dherma Sástra*, and in the written opinions of the most respectable *Pandits*, that the hand of a man who speaks truth cannot be burned; and ALI' IBRA'HI'M KHA'N certainly saw with his own eyes, as many others also saw with theirs, that the hands of the appellee in this cause were unhurt by the fire. He was consequenty discharged; but, that men might in future be deterred from demanding the trial by ordeal, the appellor was committed for a week. After all, if such a trial could be seen once or twice by several intelligent men, acquainted with natural philosophy, they might be able to assign the true reason why a man's hand may be burned in some cases, and not in others.

Ordeal by the vessel of hot oil, according to the comment on the

44

Dherma Sástra, is thus performed. The ground appointed for the trial is cleared and rubbed with cow-dung; and the next day, at sunrise, the *Pandit* worships GANE'SA presents his oblations, and pays adoration to other deities, conformably to the *Sástra:* then, having read the incantation prescribed, he places a round pan of gold, silver, copper, iron, or clay, with a diameter of sixteen fingers, and four fingers deep; and throws into it one *sér*, or eighty *sicca* weight, of clarified butter, or oil of *sesamum*. After this a ring of gold, or silver, or iron, is cleaned and washed with water, and cast into the oil, which they proceed to heat; and, when it is very hot, put into it a fresh leaf of *pippala*, or of *bilwa:* when the leaf is burned, the oil is known to be sufficiently hot. Then, having pronounced a *mentra* over the oil, they order the party accused to take the ring out of the pan; and if he take it out without being burned, or without a blister on his hand, his innocence is considered as proved; if not, his guilt.

A *Bráhman*, named RISHI'SWARA BHATTA, accused one RA'MDAYA'L, a linen painter, of having stolen his goods. RA'MDAYA'L pleaded not guilty; and, after much altercation, consented to be tried, as it had been proposed, by the vessel of oil. This well-wisher to mankind advised the *Pandits* of the court to prevent, if possible, that mode of trial; but, since the parties insisted on it, an ordeal by hot oil, according to the *Sástra*, was awarded for the same reasons which prevailed in regard to the trial by the ball. The *Pandits*, who assisted at the ceremony, were BHI'SHMA BHATTA, NA'NA'PA'T'HAC, MANIRA'MA *Pát'haca*, MENIRA'MA BHATTA, SIVA, ANANTARA'MA BHATTA, CRIPA'RA'MA, VISHNUHERI, CRISHNACHANDRA, RA'ME'NDRA, GO'VINDARA'MA, HERICRISHNA BHATTA, CA'LIDA'SA: the three last were *Pandits* of the court. When GANE'SA had been worshipped, and the *hóma* presented, according to the *Sástra*, they sent for this well-wisher to mankind; who, attended by the two *Dároghas* of the *Díváni* and *Faujdári* courts, the *Cotwal* of the town, the other officers of the court, and most of the inhabitants of *Benáres*, went to the place of trial; where he laboured to dissuade RA'MDAYA'L and his father from submitting to the ordeal; and apprized them, that, if the hand of the accused should be burned, he would be compelled to pay the value of the goods stolen, and his character would be disgraced in every company.

RA'MDAYA'L would not desist: he thrust his hand into the vessel, and was burned. The opinion of the *Pandits* was then taken; and they were unanimous, that, by the burning of his hand, his guilt was established, and he bound to pay RISHI'SWARA BHATTA the price of what he had stolen; but if the sum exceeded five hundred *ashrafis* his hand must be cut off by an express law in the *Sástra;* and a mulct also must be imposed on him according to his circumstances.

The chief magistrate, therefore, caused RA'MDAYA'L to pay RISHI'SWARA seven hundred rupees, in return for the goods which had been stolen; but, as amercements in such cases are not usual in the courts of judicature at *Benáres*, the mulct was remitted, and the prisoner discharged.

The record of this conviction was transmitted to *Calcutta* in the year of the MESSIAH 1783; and in the month of *April*, 1784, the Governor General, IMA'DU'DDAU'LAH JELA'DET JANG BEHA'DER, having seen the preceding account of trials by ordeal, put many questions concerning the meaning of *Sanscrit* words, and the cases here reported; to which he received respectful answers. He first desired to know the precise meaning of *hóma*, and was informed that it meant the oblations made to please the deities, and comprised a variety of things. Thus in the *agni hóma*, they throw into the *fire* several sorts of wood and grass, as *palás* wood, *c'hadira* wood, *racta chandan* or red sandal, *pippal-wood sami*, and *cusha* grass, together with some sorts of grain, fruit and other ingredients, as *black sesamum, barley, rice, sugar-cane, clarified butter, almonds, dates*, and *gúgal* or *bdellium*. To his next question, "how many species of *hóma* there were," it was answered, that different species were adapted to different occasions: but that, in the ordeals by hot iron, and hot oil, the same sort of oblation was used. When he desired to know the meaning of the word *mentra*, he was respectfully told, that in the language of the *Pandits* there were three such words, *mentra, yantra*, and *tantra;* that the *first* meant a passage from one of the *Védas*, in which the names of certain deities occurred; the second, a scheme of figures, which they write with a belief that their wishes will be accomplished by it; and the third, a medical preparation, by the use of which all injuries may be avoided: for they are said to rub it on their hands, and afterwards to touch red hot iron without being burned. He then asked how much barley, moistened with curds, was put into the hands of the accused person; and the answer was, *nine grains*.

His other questions were thus answered: "That the leaves of *pippala* were spread about in the hands of the accused, not heaped one above another; that the man, who performed the fire-ordeal, was not much agitated, but seemed in full possession of his faculties; that the person tried by hot oil was at first afraid, but persisted, after he was burned, in denying the theft; nevertheless, as he previously had entered into a written agreement, that, if his hand should be hurt, he wood pay the value of the goods, the magistrate for that reason thought himself justified in compelling payment; that, when the before-mentioned ingredients of the *hóma* were thrown into the fire, the *Pandits*, sitting round the *hearth*, sung the *Slócas* prescribed in the *Sástra*. That the form of the hearth is established in the *Véda* and in the *Dherma Sástra;* and this fire-place is also called *Védi;* that, for the smaller oblations, they raise a little ground for the *hearth*, and kindle fire on it; for the higher oblations, they sink the ground to receive the fire, where they perform the *hóma;* and this sacred hearth they call *cunda*." The governor then asked, why the trials by fire, by the hot ball, and the vessel of oil, if there be no essential difference between them, are not all called fire-ordeals; and it was humbly answered, that, according to some *Pandits*, they were all three different; whilst others insisted, that the trial by fire was distinct from that by the vessel, though the trial by the hot ball and the head of a lance were the same; but, that, in the apprehension of his respectful servant, they were all *ordeals by fire*.

THE INDIAN LAW OF ORDEAL,

Verbally translated from YA'GYAWALCYA.

1. THE balance, fire, water, poison, the idol—these are the ordeals used here bellow for the proof of innocence, when the accusations are heavy, and when the accuser offers to hazard a mulct, (if he should fail):

2. Or one party may be tried, if he please, by ordeal, and the other must then risque an amercement. But the trial may take place even without any wager, if the crime committed be injurious to the prince.

3. The sovereign, having summoned the accused, while his clothes are yet moist from bathing, at sunrise, before he has broken his fast, shall cause all trials by ordeal to be conducted in the presence of *Bráhmans*.

4. The balance is for women, children, old men, the blind, the lame, *Bráhmans*, and the sick; for the *Súdra*, fire or water, or seven barley-corns of poison.

5. Unless the loss of the accuser amount to a thousand pieces of silver, the accused must not be tried by the red hot ball, nor by poison, nor by the scales; but if the offence be against the king, or if the crime be heinous, he must acquit himself by one of those trials in all cases.

6. He who has recourse to the balance, must be attended by persons experienced in weighing, and go down into one scale, with an equal weight placed in the other, and a groove (with water in it) marked on the beam.

7. "Thou, O balance, art the mansion of truth; thou wast an-
"ciently contrived by deities: declare the truth, therefore, O giver of
"success, and clear me from all suspicion.

8. "If I am guilty, O venerable as my own mother, then sink
"me down; but if innocent raise me aloft." Thus shall he address the balance.

9. If he sink, he is convicted, or if the scales be broken; but if the string be not broken, and he rise aloft, he must be acquitted.

10. On the trial by fire, let both hands of the accused be rub-

bed with rice in the husk, and well examined: then let seven leaves of the *Aswatt'ha* (the religious fig-tree) be placed on them, and bound with seven threads.

11. "Thou, O fire, pervadest all beings; O cause of purity, who "givest evidence of virtue and of sin, declare the truth in this my hand."

12. When he has pronounced this, the priest shall place in both his hands an iron ball, red hot, and weighing fifty *palas**.

13. Having taken it, he shall step gradually into seven circles, each with a diameter of sixteen fingers, and separated from the next by the same space.

14. If, having cast away the hot ball, he shall again have his hands rubbed with rice in the husk, and shall show them unburned, he will prove his innocence. Should the iron fall during the trial, or should a doubt arise (on the regularity of the proceedings) he must be tried again.

15. "Preserve me, O VARUNA, by declaring the truth." Thus having invoked the god of waters, the accused shall plunge his head into the river or pool, and hold both thighs of a man, who shall stand in it up to his navel:

16. A swift runner shall then hasten to fetch an arrow shot at the moment of his plunging; and if, while the runner is gone the priest shall see the head of the accused under water, he must be discharged as innocent.

17. "Thou, O poison, art the child of BRAHMA', stedfast in "justice and in truth: clear me then from this heavy charge, and, if "I have spoken truly, become nectar to me."

18. Saying this, he shall swallow the poison *Sárnga*, from the tree which grows on the mountain *Himálaya*; and if he digest it without any inflamation, the prince shall pronounce him guiltless.

19. Or the priest shall perform rites to the image of some tremendous deity, and, having bathed the idol, shall make the accused to drink three handfuls of the water, that has dropped from it:

20. If, in fourteen days after, he suffer no dreadful calamity from the act of the deity or of the king, he must indubitably be acquitted.

* A *pala* is four *carsha's*, and a *carsha*, eighty *ractica's*, or seeds of the *Gunjà* creeper, each weighing above a grain and a quarter or, correctly, $1\frac{5}{16}$ gr.

XXIV.

THE SECOND ANNIVERSARY DISCOURSE,

DELIVERED 24th FEBRUARY, 1785.

BY THE PRESIDENT.

GENTLEMEN,

IF the Deity of the *Hindus*, by whom all their just requests are believed to be granted with singular indulgence, had proposed last year to gratify my warmest wishes, I could have desired nothing more ardently than the success of your institution; because I can desire nothing in preference to the general good, which your plan seems calculated to promote, by bringing to light many useful and interesting tracts, which, being too short for separate publication, might lie many years concealed, or, perhaps, irrecoverably perish. My wishes are accomplished, without an invocation to CA'MADHE'NU; and your Society, having already passed its infant state, is advancing to maturity with every mark of a healthy and robust constitution. When I reflect, indeed, on the variety of subjects which have been discussed before you, concerning the history, laws, manners, arts, and antiquities of *Asia*, I am unable to decide whether my pleasure or my surprise be the greater; for I will not dissemble, that your progress has far exceeded my expectations: and, though we must seriously deplore the loss of those excellent men who have lately departed from this capital, yet, there is a prospect still of large contributions to your stock of *Asiatic* learning, which, I am persuaded, will continually increase. My late journey to *Benáres* has enabled me to assure you, that many of your members, who reside at a distance, employ a part of their leisure in preparing additions to your archives; and, unless I am too sanguine, you will soon receive light from them on several topics entirely new in the republic of letters.

It was principally with a design to open sources of such information, that I long had meditated an expedition up the *Ganges* during the suspension of my business; but although I had the satisfaction of visiting two ancient seats of *Hindu* superstition and literature, yet, illness having detained me a considerable time in the way, it was not in my power to continue in them long enough to pursue my inquiries; and I left them, as ÆNEAS is feigned to have left the shades, when his guide made him recollect *the swift flight of irrevocable time*, with a curiosity raised to the height, and a regreat not easy to be described.

Whoever travels in *Asia*, especially if he be conversant with the literature of the countries through which he passes, must naturally remark the superiority of *European* talents. The observation, indeed, is at least as old as ALEXANDER; and, though we cannot agree with the sage preceptor of that ambitious Prince, that "the *Asiatics* are born to be slaves," yet the *Athenian* poet seems perfectly in the right, when he represents *Europe* as a *sovereign Princess*, and *Asia* as *her Handmaid*: but, if the mistress be transcendently majestic, it cannot be denied that the attendant has many beauties, and some advantages peculiar to herself. The ancients were accustomed to pronounce *panegyrics* on their own countrymen at the expense of all other nations; with a political view, perhaps, of stimulating them by praise, and exciting them to still greater exertions; but such arts are here unnecessary; nor would they, indeed, become a Society, who seek nothing but truth unadorned by rhetoric: and, although we must be conscious of our superior advancement in all kinds of useful knowledge, yet we ought not therefore to contemn the people of *Asia*, from whose researches into nature, works of art, and inventions of fancy, many valuable hints may be derived for our own improvement and advantage. If that, indeed, were not the principal object of your institution, little else could arise from it, but the mere gratification of curiosity; and I should not receive so much delight from the humble share which you have allowed me to take in promoting it.

To form an exact parallel between the works and actions of the Western and Eastern Worlds, would require a tract of no inconsiderable length; but we may decide, on the whole, that reason and taste are the grand prerogatives of *European* minds, while the *Asiatics* have soared to loftier heights in the sphere of imagination. The civil history of their vast empires, and of *India* in particular, must be highly interesting to our common country: but we have a still nearer interest in knowing all former modes of ruling *these inestimable provinces*, on the prosperity of which so much of our national welfare, and individual benefit, seems to depend. A minute *geographical* knowledge, not only of *Bengal* and *Bahar*, but, for evident reasons, of *all the kingdoms bodering on them*, is closely connected with an account of their many revolutions: but the *natural* productions of these territories, especially in the *vegitable* and *mineral* systems, are momentous objects of research to an *imperial*, but, which is a character of equal dignity, a *commercial* people.

If *botany* may be described by metaphors drawn from the science itself, we may justly pronounce a minute acquaintance with *plants*, their *classes*, *orders*, *kinds*, and *species*, to be its *flowers*, which can only produce *fruit* by an application of that knowledge to the purposes of life, particularly to *diet*, by which diseases may be avoided; and to *medicine*, by which they may be remedied: for the improvement of the last mentioned art, than which none surely can be more beneficial to mankind, the virtues of *minerals* also should be accurately known. So highly has medical skill been prized by the ancient *Indians*, that one of the *fourteen Retnas*, or *precious things*, which their Gods are believed to have produced by churning the ocean with the mountain *Mandara*, was *a learned physician*. What their old books contain on this subject, we ought certainly to discover, and that without loss of time; lest the venerable, but abstruse, language, in which they are composed, should cease to be perfectly intelligible, even to the best educated natives, through a want of powerful invitation to study it. BERNIER, who was himself of the faculty, mentions approved medical books in *Sanscrit*, and cites a few aphorisms which appear judicious and rational; but we can expect nothing so important from the works of *Hindu* or *Muselman* physicians, as the knowledge, which experience must have given them, of *simple* medicines. I have seen an *Indian* prescription of *fifty-four*, and another of *sixty-six*, ingredients; but such compositions are always to be suspected, since the effect of one ingredient may destroy that of another, and it were better to find certain accounts of a single leaf or berry, than to be acquainted with the most elaborate compounds, unless they too have been proved by a multitude of successful ex periments. The noble deobstruent oil, extracted from the *eranda* nut, the whole family of *Balsams*, the incomparable stomachic root from *Columbo*, the fine astringent ridiculously called *Japan* earth, but in truth produced by the decoction of an *Indian* plant, have long been used in *Asia;* and who can foretel what glorious discoveries of other oils, roots, and salutary juices, may be made by your Society? If it be doubtful whether the *Peruvian* bark be *always* efficacious in this country, its place may, perhaps, be supplied by some indigenous vegetable equally antiseptic, and more congenial to the climate. Whether any treatises on *Agriculture* have been written by experienced natives of these provinces, I am not yet informed; but since the court of *Spain* expect to find useful remarks in an *Arabic* tract preserved in the *Escurial*, on *the cultivation of land in that kingdom*, we should inquire for similar compositions, and examine the contents of such as we can procure.

The sublime science of Chemistry, which I was on the point of calling *divine*, must be added, as a key to the richest treasuries of nature; and it is impossible to foresee how greatly it may improve our *manufactures*, especially if it can fix those brilliant *dyes*, which want nothing of perfect beauty but a longer continuance of their splendour; or how far it may lead to new methods of *fluxing and compounding metals*, which the *Indians*, as well as the *Chinese*, are thought to have practised in higher perfection than ourselves.

In those elegant arts, which are called *fine* and *liberal*, though of less general utility than the labours of the mechanic, it is really wonderful how much a single nation has excelled the whole world: I mean the ancient *Greeks*, whose *sculpture*, of which we have exquisite remains, both on gems and in marble, no modern tool can equal; whose *architecture* we can only imitate at a servile distance, but are unable to make one addition to it, without destroying its graceful simplicity; whose *poetry* still delights us in youth, and amuses us at a maturer age; and of whose *painting* and *music* we have the concurrent relations of so many grave authors, that it would be strange incredulity to doubt their excellence. *Painting*, as an art belonging to the powers of the imagination, or what is commonly called *Genius*, appears to be yet in its infancy among the people of the east: but the *Hindu* system of *music* has, I believe,

been formed on truer principles than our own; and all the skill of the native composers is directed to the great object of their art, *the natural expression of strong passions*, to which *melody*, indeed, is often sacrificed; though some of their tunes are pleasing even to an *European* ear. Nearly the same may be truly asserted of the *Arabian* or *Persian* system; and, by a correct explanation of the best books on that subject, much of the old *Grecian* theory may probably be recovered.

The *poetical* works of the *Arabs* and *Persians*, which differ surprisingly in their style and form, are here pretty generally known; and, though tastes, concering which there can be no disputing, are divided in regard to their merit, yet we may safely say of them, what ABULFAZL pronounces of the *Mahábhárat*, that, "although "they abound with extravagant images and descriptions, they are in "the highest degree entertaining and instructive." Poets of the greatest genius, PINDAR, ÆSCHYLUS, DANTE, PETRARCA, SHAKSPEARE, SPENSER, have most abounded in images not far from the brink of absurdity; but, if their luxuriant fancies, or those of ABULOLA, FIRDAUSI, NIZA'MI, were pruned away at the hazard of their strength and majesty, we should lose many pleasures by the amputation. If we may form a just opinion of the *Sanscrit* poetry from the specimens already exhibited, (though we can only judge perfectly by consulting the originals,) we cannot but thirst for the whole work of VYA'SA, with which a member of our Society, whose presence deters me from saying more of him, will in due time gratify the public. The poetry of *Mathurà*, which is the *Parnassian* land of the *Hindus*, has a softer and less elevated strain; but, since the inhabitants of the districts near *Agra*, and principally of the *Duab*, are said to surpass all other *Indians* in eloquence, and to have composed many agreeable tales and love-songs, which are still extant, the *Bhàshà*, or *vernacular idiom* of *Vraja*, in which they are written, should not be neglected. No specimens of genuine *oratory* can be expected from nations, among whom the form of government precludes even the idea of *popular eloquence;* but the art of writing, in elegant and modulated periods, has been cultivated in *Asia* from the earliest ages: the *Védas*, as well as the *Alkoran*, are written in measured prose; and the compositions of ISOCRATES are not more highly polished than those of the best *Arabian* and *Persian* authors.

Of the *Hindu* and *Muselman* architecture there are yet many noble remains in *Bahar*, and some in the vicinity of *Malda*; nor am I unwilling to believe, that even those ruins, of which you will, I trust, be presented with correct delineations, may furnish our own architects with new ideas of beauty and sublimity.

Permit me now to add a few words on the *sciences*, properly so named; in which it must be admitted, that the *Asiatics*, if compared with our western nations, are mere children. One of the most sagacious men in this age, who continues, I hope, to improve and adorn it, SAMUEL JOHNSON, remarked in my hearing, that, "if NEWTON had flourished in ancient *Greece*, he would have "been worshipped as a divinity:" how zealously then would he be adored in *Hindusthan*, if his incomparable writings could be read and comprehended by the *Pandits* of *Cashmír* or *Benáres!* I have seen a mathematical book in *Sanscrit* of the highest antiquity; but soon perceived from the diagrams, that it contained only simple elements: there may, indeed, have been, in the favourable atmosphere of *Asia*, some diligent observers of the celestial bodies; and such observations as are recorded should indisputably be made public; but let us not expect any new *methods*, or the analysis of new *curves*, from the geometricians of *Iran*, *Turkistan*, or *India*. Could the works of ARCHIMEDES, the NEWTON of *Sicily*, be restored to their genuine purity by the help of *Arabic* versions, we might then have reason to triumph on the success of our scientifical inquiries; or could the successive improvements and various rules of *Algebra* be traced through *Arabian* channels, to which CARDAN boasted that he had access, the modern history of *Mathematics* would receive considerable illustration.

THE Jurisprudence of the *Hindus* and *Muselmans* will produce more immediate advantage; and, if some standard *law-tracts* were accurately translated from the *Sanscrit* and *Arabic*, we might hope in time to see so complete a digest of *Indian* Laws, that all disputes among the natives might be decided without *uncertainty*, which is, in truth, a disgrace, though satirically called a *glory*, to the forensic science.

All these objects of inquiry must appear to you, Gentlemen, in so strong a light, that bare intimations of them will be sufficient; nor is it necessary to make use of *emulation* as an incentive to an ardent pursuit of them: yet I cannot forbear expressing a wish, that the activity of the *French* in the same pursuits may not be superior to ours; and that the researches of M. SONNERAT, whom the court of *Versailles* employed for seven years in these climates, merely to collect such materials as we are seeking, may kindle, instead, of abating, our own curiosity and zeal. If you assent, as I flatter myself you do, to these opinions, you will also concur in promoting the object of them; and a few ideas having presented themselves to my mind, I presume to lay them before you, with an entire submission to your judgment.

No contributions, except those of the literary kind, will be requisite for the support of the Society; but if each of us were occasionally to contribute a succinct description of such manuscripts as he had perused or inspected, with their dates and the names of their owners, and to propose for solution such *questions* as had occurred to him concerning *Asiatic* Art, Science, and History, natural or civil, we should possess without labour, and almost by imperceptible degrees, a fuller catalogue of oriental books, than has hitherto been exhibited; and our correspondents would be apprised of those points to which we chiefly direct our investigations. Much may, I am confident, be expected from the communications of *learned natives*, whether lawyers, physicians, or private scholars, who would eagerly, on the first invitation, send us their *Mekámát* and *Risálahs* on a variety of subjects: some for the sake of advancing general knowledge, but most of them from a desire, neither uncommon nor unreasonable, of attracting notice, and recommending themselves to favour. With a view to avail ourselves of this disposition, and to bring their latent science under our inspection, it might be advisable to print and circulate a short memorial, in *Persian* and *Hindi*, setting forth, in a style accommodated to their own habits and prejudices, the design of our institution; nor would it be impossible hereafter, to give a medal annually, with inscriptions, in *Persian* on one side, and on the reverse in *Sanscrit*, as the prize of merit, to the writer of the best essay or dissertation. To instruct others is the prescribed duty of learned *Bráhmans*, and if they be men of substance, without reward; but they would all be flattered with an honorary mark of distinction; and the *Mahomedans* have not only the permission, but the positive command, of their lawgiver, *to search for learning even in the remotest parts of the globe.* It were superflous to suggest, with how much correctness and facility their compositions might be translated for our use, since their languages are now more generally and perfectly understood than they have ever been by any nation of *Europe*.

I have detained you, I fear, too long by this address, though it has been my endeavour to reconcile comprehensiveness with brevity. The subjects, which I have lightly sketched, would be found, if minutely examined, to be inexhaustible; and, since no limits can be set to your researches but the boundaries of *Asia* itself, I may not improperly conclude with wishing for your society, what the Commentator on the Laws prays for the constitution of our country, that IT MAY BE PERPETUAL.

XXV.

THE THIRD ANNIVERSARY DISCOURSE,

DELIVERED 2D FEBRUARY, 1786.

BY THE PRESIDENT.

IN the former discourses, which I had the honor of addressing to you, Gentlemen, on the *institution* and *objects* of our Society, I confined myself purposely to general topics; giving in the first a distant prospect of the vast career on which we were entering; and, in the second, exhibiting a more diffuse, but still superficial, sketch of the various discoveries in History, Science, and Art, which we might justly expect from our inquiries into the Literature of *Asia*. I now propose to fill up that outline so comprehensively as to omit nothing essential, yet so concisely as to avoid being tedious; and, if the state of my health shall suffer me to continue long enough in this climate, it is my design, with your permission, to prepare for our annual meetings a series of short dissertations, unconnected in their titles and subjects, but all tending to a common point of no small importance in the pursuit of interesting truths.

Of all the works which have been published in our own age, or, perhaps, in any other, on the History of the Ancient World, and *the first population of this habitable globe*, that of Mr. JACOB BRYANT, whom I name with reverence and affection, has the best claim to the praise of deep erudition ingeniously applied, and new theories happily illustrated, by an assemblage of numberless converging rays from a most extensive circumference: it falls, nevertheless, as every human work must fall, short of perfection; and the least satisfactory part of it seems to be that which relates to the derivation of words from *Asiatic* languages. Etymology has, no doubt, some use in historical researches; but it is a medium of proof so very fallacious, that, where it elucidates one fact, it obscures a thousand, and more frequently borders on the ridiculous, than leads to any solid conclusion. It rarely carries with it any *internal* power of conviction from a resemblance of sounds or similarity of letters; yet often, where it is wholly unassisted by those advantages, it may be indisputably proved by *extrinsic* evidence. We know *à posteriori*, that both *fitz* and *hijo*, by the nature of two several dialects, are derived from *filius*; that *uncle* comes from *avus*, and *stranger* from *extra*; that *jour* is deducible, through the *Italian*, from *dies*; and *rossignol* from *luscinia*, or the *singer in groves*; that *sciuro*, *écureuil*, and *squirrel* are compounded of two *Greek* words descriptive of the animal; which etymologies, though they could not have been demonstrated *à priori*, might serve to confirm, if any such confirmation were necessary, the proofs of a connection between the members of one great empire; but, when we derive our *hanger*, or *short pendent sword*, from the *Persian*, because ignorant travellers thus mis-spell the word *khanjar*, which, in truth, means a different weapon; or *sandal-wood* from the *Greek*, because we suppose that *sandals* were sometimes made of it, we gain no ground in proving the affinity of nations, and only weaken arguments which might otherwise be firmly supported. That CU'S, then, or, as it certainly is written in one ancient dialect, CU'T, and in others, probably, CA'S, enters into the composition of many proper names, we may very reasonably believe; and that *Algeziras* takes its name from the *Arabic* word for an *island*, cannot be doubted; but, when we are told from *Europe*, that places and provinces in *India* were clearly denominated from those words, we cannot but observe, in the first instance, that the town, in which we now are assembled, is properly written and pronounced *Calicátà*; that both *Cálá* and *Cút* unquestionably mean *places of strength*, or, in general, any *inclosures*; and that *Gujaràt* is at least as remote from *Jezirah* in sound, as it is in situation.

Another exception (and a third could hardly be discovered by any candid criticism) to the *Analysis of Ancient Mythology*, is, that the *method* of reasoning, and arrangement of topics, adopted in that learned work, are not quite agreeable to the title, but almost wholly *synthetical*; and, though *synthesis* may be the better mode in pure *science*, where the principles are undeniable, yet it seems less calculated to give complete satisfaction in *historical* disquisitions, where every postulatum will, perhaps, be refused, and every definition controverted. This may seem a slight objection; but the subject is in itself so interesting, and the full conviction of all reasonable men so desirable, that it may not be lost labour to discuss the same or a similar theory in a method purely analytical, and, after beginning with facts of general notoriety, or undisputed evidence, to investigate such truths as are at first unknown, or very imperfectly discerned.

The *five* principal nations who have in different ages divided among themselves, as a kind of inheritance, the vast continent of *Asia*, with the many islands depending on it, are the *Indians*, the *Chinese*, the *Tartars*, the *Arabs* and the *Persians*: *who* they severally were, *whence* and *when* they came, *where* they now are settled, and *what advantage* a more perfect knowledge of them all may bring to our *European* world, will be shown, I trust, in *five* distinct essays; the last of which will demonstrate the connexion or diversity between them, and solve the great problem, whether they had *any* common origin, and whether that origin was *the same* which we generally ascribe to them.

I begin with *India*; not because I find reason to believe it the true centre of population or of knowledge, but because it is the country which we now inhabit, and from which we may best survey the regions around us; as, in popular language, we speak of the *rising* sun, and of his *progress through the Zodiac*, although it had long ago been imagined, and is now demonstrated, that he is himself the centre of our planetary system. Let me here premise, that, in all these inquiries concerning the history of *India*, I shall confine my researches downwards to the *Mohammedan* conquests at the beginning of the *eleventh* century, but extend them upwards, as high as possible, to the earliest authentic records of the human species.

India then, on its most enlarged scale, in which the ancients appear to have understood it, comprises an area of near *forty* degrees on each side, including a space almost as large as all *Europe*; being divided on the west from *Persia* by the *Arachosian* mountains, limited on the east by the *Chinese* part of the farther peninsula, confined on the north by the wilds of *Tartary*, and extending to the south as far as the isles of *Java*. This trapezium, therefore, comprehends the stupendous hills of *Potyid* or *Tibet*, the beautiful valley of *Cashmír*, and all the domains of the old *Indoscythians*, the countries of *Népál* and *Butánt*, *Cámrùp* or *Asàm*, together with

Siam, *Ava*, *Racan*, and the bordering kingdoms, as far as the *China* of the *Hindus*, or *Sín* of the *Arabian* Geographers; not to mention the whole western peninsula, with the celebrated island of *Sinhala*, or *Lion-like men*, at its southern extremity. By *India*, in short, I mean that whole extent of country in which the primitive religion and languages of the *Hindus* prevail at this day with more or less of their ancient purity, and in which the *Nágarì* letters are still used with more or less deviation from their original form.

The *Hindus* themselves believe their own country, to which they give the vain epithets of *Medhyama*, or *Central*, and *Punyabhúmi*, or the *land of Virtues*, to have been the portion of BHARAT, one of *nine* brothers, whose father had the dominion of the whole earth; and they represent the mountains of *Himálaya* as lying to the north; and to the west, those of *Vindhya*, called also *Vindian* by the *Greeks*; beyond which the *Sindhu* runs in several branches to the sea, and meets it nearly opposite to the point of *Dwáracá*, the celebrated seat of their Shepherd God. In the *south-east* they place the great river *Saravatya*; by which they probably mean that of *Ava*, called also *Airávati* in part of its course, and giving perhaps its ancient name to the gulf of *Sabara*. This domain of *Bharat* they consider as the middle of the *Jambudwípa*, which the *Tibetians* also call the land of *Zambu*; and the appellation is extremely remarkable; for *Jambu* is the *Sanscrit* name of a delicate fruit, called *Jáman* by the *Muselmans*, and by us *rose-apple*; but the largest and richest sort is named *Amrita*, or *Immortal*; and the mythologists of *Tibet* apply the same word to a celestial tree bearing *ambrosial fruit*, and adjoining to *four* vast rocks, from which as many sacred rivers derive their several streams.

The inhabitants of this extensive tract are described by Mr. LORD with great exactness, and with a picturesque elegance peculiar to our ancient language: "A people, (says he,) presented them-" selves to mine eyes, clothed in linen garments somewhat low de-" scending, of a gesture and garb, as I may say, maidenly and well " nigh effeminate, of a countenance shy and somewhat estranged, " yet smiling out a glozed and bashful familiarity." Mr. ORME, " the Historian of *India*, who unites an exquisite taste for every fine art with an accurate knowledge of *Asiatic* manners, observes, in his elegant preliminary Dissertation, that this "country has been " inhabited from the earliest antiquity by a people who have no " resemblance, either in their figure or manners, with any of the " nations contiguous to them;" and that, "although conquerors have " established themselves at different times in different parts of *India*, " yet the original inhabitants have lost very little of their original " character." The ancients, in fact, give a description of them, which our early travellers confirmed, and our own personal knowledge of them nearly verifies; as you will perceive from a passage in the Geographical Poem of DIONYSIUS, which the Analyst of Ancient Mythology has translated with great spirit:

"To th' east a lovely country wide extends,
"INDIA, whose borders the wide ocean bounds;
"On this the sun, new rising from the main,
"Smiles pleas'd, and sheds his early orient beam.
"Th' inhabitants are swart, and in their locks
"Betray the tints of the dark hyacinth.
"Various their functions; some the rock explore,
"And from the mine extract the latent gold;
"Some labour at the woof with cunning skill,
"And manufacture linen; others shape
"And polish iv'ry with the nicest care:
"Many retire to rivers shoal, and plunge
"To seek the beryl flaming in its bed,
"Or glitt'ring diamond. Oft the jasper's found
"Green, but diaphanous; the topaz too
"Of ray serene and pleasing; last of all
"The lovely amethyst, in which combine
"All the mild shades of purple. The rich soil,
"Wash'd by a thousand rivers, from all sides
"Pours on the natives wealth without control."

Their sources of wealth are still abundant, even after so many revolutions and conquests: in their manufactures of cotton they still surpass all the world; and their features have, most probably, remained unaltered since the time of DIONYSIUS; nor can we reasonably doubt, how degenerate and abased soever the *Hindus* may now appear, that in some early age they were splendid in arts and arms, happy in government, wise in legislation, and eminent in various knowledge: but, since their civil history beyond the middle of the *nineteenth* century from the present time, is involved in a cloud of fables, we seem to possess only *four* general media of satisfying our curiosity concerning it; namely, first, their *Languages* and *Letters;* secondly, their *Philosophy* and *Religion;* thirdly, the actual remains of their old *Sculpture* and *Architecture;* and fourthly, the written memorials of their *Sciences* and *Arts*.

I. It is much to be lamented that neither the *Greeks*, who attended ALEXANDER into *India*, nor those who were long connected with it under the *Bactrian* Princes, have left us any means of knowing with accuracy, what vernacular languages they found on their arrival in this Empire. The *Mohammedans*, we know, heard the people of proper *Hindusthan* or *India*, on a limited scale, speaking a *Bháshá*, or living tongue, of a very singular construction, the purest dialect of which was current in the districts round *Agrà*, and chiefly on the poetical ground of *Mat'hurà;* and this is commonly called the idiom of *Vraja*. Five words in six, perhaps, of this language were derived from the *Sanscirt*, in which books of religion and science were composed, and which appears to have been formed by an exquisite grammatical *arrangement*, as the name itself implies, from some unpolished idiom; but the basis of the *Hindustánì*, particularly the inflexions and regimen of verbs, differed as widely from both those tongues, as *Arabic* differs from *Persian*, or *German* from *Greek*. Now the general effect of conquest is to leave the current language of the conquered people unchanged, or very little altered, in its ground-work, but to blend with it a considerable number of exotic names both for things and for actions; as it has happened in every country, that I can recollect, where the conquerors have not preserved their own tongue unmixed with that of the natives, like the *Turks* in *Greece*, and the *Saxons* in *Britain;* and this analogy might induce us to believe, that the pure *Hindì*, whether of *Tartarian* or *Chaldean* origin, was primeval in Upper *India*, into which the *Sanscrit* was introduced by conquerors from other kingdoms in some very remote age; for we cannot doubt that the language of the *Védas* was used in the great extent of country, which has before been delineated, as long as the religion of *Brahmá* has prevailed in it.

The *Sanscrit* language, whatever be its antiquity, is of a wonderful structure; more perfect than the *Greek*, more copious

than the *Latin* and more exquisitely refined than either; yet bearing to both of them a stronger affinity, both in the roots of verbs, and in the forms of grammar, than could possibly have been produced by accident; so strong, indeed, that no philologer could examine them all three, without believing them to have sprung from some common source, which, perhaps, no longer exists. There is a similar reason, though not quite so forcible, for supposing that both the *Gothic* and the *Celtic*, though blended with a very different idiom, had the same origin with the *Sanscrit;* and the old *Persian* might be added to the same family, if this were the place for discussing any question concerning the antiquities of *Persia*.

The *characters*, in which the languages of *India* were originally written, are called *Nágarí*, from *Nagara*, a city, with the word *Déva* sometimes prefixed, because they are believed to have been taught by the Divinity himself, who prescribed the artificial order of them in a voice from heaven. These letters, with no greater variation in their form by the change of straight lines to curves, or conversely, than the *Cufic* alphabet has received in its way to *India*, are still adopted in more than twenty kingdoms and states, from the borders of *Cashgar* and *Khoten*, to *Ráma's* Bridge, and from the *Sindhu* to the river of *Siam;* nor can I help believing, although the polished and elegant *Dévanágarí* may not be so ancient as the monumental characters in the caverns of *Jarasandha*, that the square *Chaldaic* letters, in which most *Hebrew* books are copied, were originally the same, or derived from the same prototype, both with the *Indian* and *Arabian* characters. That the *Phenician*, from which the *Greek* and *Roman* alphabets were formed by various changes and inversions, had a similar origin, there can be little doubt; and the inscriptions at *Canárah*, of which you now possess a most accurate copy, seem to be compounded of *Nágarí* and *Ethiopic* letters, which bear a close relation to each other, both in the mode of writing from the left hand, and in the singular manner of connecting the vowels with the consonants. These remarks may favour an opinion entertained by many, that all the symbols of *sound*, which at first, probably, were only rude outlines of the different organs of speech, had a common origin. The symbols of *ideas*, now used in *China* and *Japan*, and formerly, perhaps, in *Egypt* and *Mexico*, are quite of a distinct nature; but it is very remarkable, that the order of *sounds* in the *Chinese* grammers corresponds nearly with that observed in *Tibet*, and hardly differs from that which the *Hindus* consider as the invention of their Gods.

II. Of the *Indian* Religion and Philosophy I shall here say but little, because a full account of each would require a separate volume. It will be sufficient in this dissertation to assume, what might be proved beyond controversy, that we now live among the adorers of those very Deities who were worshipped under different names in old *Greece* and *Italy*; and among the professors of those philosophical tenets, which the *Ionic* and *Attic* writers illustrated with all the beauties of their melodious language. On one hand we see the trident of NEPTUNE, the eagle of JUPITER, the satyrs of BACCHUS, the bow of CUPID, and the chariot of the *Sun*; on another we hear the cymbals of RHEA, the songs of the *Muses*, and the pastoral tales of APOLLO NOMIUS. In more retired scenes, in groves, and in seminaries of learning, we may perceive the *Bráhmans* and the *Sarmanes*, mentioned by CLEMENS, disputing in the forms of *logic*, or discoursing on the vanity of human enjoyments, on the immortality of the soul, her emanation from the eternal mind, her debasement, wanderings, and final union with her source. The *six* philosophical schools, whose principles are explained in the *Dersana Sástra*, comprise all the metaphysics of the old *Academy*, the *Stoa*, the *Lyceum*; nor is it possible to read the *Védánta*, or the many fine compositions in illustration of it, without believing, that PYTHAGORAS and PLATO derived their sublime theories from the same fountain with the sages of *India*. The *Scythian* and *Hyperborean* doctrines and mythology may also be traced in every part of these eastern regions; nor can we doubt, that WOD or ODEN, whose religion, as the northern historians admit, was introduced into *Scandinavia* by a foreign race, was the same with BUDDHA, whose rites were probably imported into *India* nearly at the same time, though received much later by the *Chinese*, who soften his name into FO'.

This may be a proper place to ascertain an important point in the Chronology of the *Hindus*; for the priests of BUDDHA left in *Tibet* and *China* the precise epoch of his appearance, real or imagined, in this Empire; and their information, which had been preserved in writing, was compared by the *Christian* Missionaries and

scholars with our own era. COUPLET, DE GUIGNES, GIORGI, and BAILLY, differ a little in their accounts of this epoch, but that of COUPLET seems the most correct: on taking, however, the medium of the four several dates, we may fix the time of BUDDHA, or the *ninth* great incarnation of VISHNU, in the year one *thousand* and *fourteen* before the birth of CHRIST, or *two thousand seven hundred and ninety-nine* years ago. Now the *Cáshmirians*, who boast of his descent in their kingdom, assert that he appeared on earth about *two* centuries after CRISHNA the *Indian* APOLLO, who took so decided a part in the war of the *Mahábhárat*; and, if an etymologist were to suppose, that the *Athenians* had embellished their poetical history of PANDION'S expulsion and the restoration of ÆGEUS with the *Asiatic* tale of the PA'NDUS and YUDHISHTIR, neither of which words they could have articulated, I should not hastily deride his conjecture. Certain it is, that *Pándumandel* is called by the *Greeks* the country of PANDION. We have, therefore, determined another interesting epoch, by fixing the age of CRISHNA near the *three thousandth* year from the present time; and, as the three first *Avatárs*, or desecents of VISHNU, relate no less clearly to *an* Universal Deluge, in which eight persons only were saved, than the *fourth* and *fifth* do to the *punishment of impiety* and the *humiliation* of the *proud*, we may for the present assume, that the *second*, or *silver*, age of the *Hindus* was subsequent to the dispersion from *Babel*; so that we have only a dark interval of about a *thousand* years, which were employed in the settlement of nations, the foundation of states or empires, and the cultivation of civil society. The great incarnate Gods of this intermediate age are both named RA'MA, but with different epithets; one of whom bears a wonderful resemblance to the *Indian* BACCHUS, and his wars are the subject of several heroic poems. He is represented as a descendant from SU'RYA, or the SUN; as the husband of SI'TA', and the son of a princess named CAU'SELYA'. It is very remarkable, that the *Peruvians*, whose *Incas* boasted of the same descent, styled their greatest festival *Ramasitoa*; whence we may suppose that South *America* was peopled by the same race, who imported into the farthest parts of *Asia* the rites and fabulous history of RA'MA. These rites and this history are extremely curious, and although I cannot believe, with NEWTON, that ancient mythology was nothing but historical truth in a poetical dress; nor, with BACON, that it consisted solely of moral and metaphysical allegories; nor, with BRYANT, that all the heathen Divinities are only different attributes and representations of the Sun, or of deceased progenitors; but conceive that the whole system of religious fables rose, like the *Nile*, from several distinct sources; yet I cannot but agree that one great spring and fountain of all idolatry, in the four quarters of the globe, was the veneration paid by men to the vast body of fire which "looks from his sole dominion like the God of this world;" and another, the immoderate respect shown to the memory of powerful or virtuous ancestors, especially the founders of kingdoms, legislators, and warriors, of whom the *Sun* or the *Moon* were wildly supposed to be the parents.

III. The remains of *Architecture* and *Sculpture* in *India*, which I mention here as mere monuments of antiquity, not as specimens of ancient art, seem to prove an early connection between this country and *Africa*. The pyramids of *Egypt*, the colossal statues described by PAUSANIAS and others, the Sphinx, and the HERMES *Canis*, (which last bears a great resemblance to the *Varáhávatár*, or the incarnation of VISHNU in the form of a *Boar*,) indicate the style and mythology of the same indefatigable workmen who formed the vast excavations of *Canárah*, the various temples and images of BUDDHA, and the idols which are continually dug up at *Gayá*, or in its vicinity. The letters on many of those monuments appear, as I have before intimated, partly of *Indian*, and partly of *Abyssinian* or *Ethiopic*, origin; and all these indubitable facts may induce no ill-grounded opinion, that *Ethiopia* and *Hindustan* were peopled or colonized by the same extraordinary race; in confirmation of which, it may be added, that the mountaineers of *Bengal* and *Bahàr* can hardly be distinguished in some of their features, particularly their lips and noses, from the modern *Abyssinians*, whom the *Arabs* call the children of CU´SH: and the ancient *Hindus*, according to STRABO, differed in nothing from the *Africans*, but in the straightness and smoothness of their hair, while that of the others was crisp or woolly; a difference proceeding chiefly, if not entirely, from the respective humidity or dryness of their atmospheres. Hence the people who *received the first light of the rising sun*, according to the limited knowledge of the ancients, are said by APULEIUS to be the *Arii* and *Ethiopians*, by which he clearly meant certain nations of *India;* where we frequently see figures of BUDDHA with *curled hair*, apparently designed for a representation of it in its natural state.

IV. It is unfortunate that the *Silpa Sástra*, or *Collection of Treatises on Arts* and *Manufactures*, which must have contained a treasure of useful information on *dying*, *painting*, and *metallurgy*, has been so long neglected, that few, if any traces of it are to be found; but the labours of the *Indian* loom and needle have been universally celebrated; and *fine linen* is not improbably supposed to have been called *Sindon*, from the name of the river near which it was wrought in the highest perfection. The people of *Colchis* were also famed for this manufacture; and the *Egyptians* yet more, as we learn from several passages in scripture, and particularly from a beautiful chapter in EZEKIEL, containing the most authentic delineation of ancient commerce, of which *Tyre* had been the principal mart. Silk was fabricated immemorially by the *Indians*, though commonly ascribed to the people of *Serica* or *Tancùt*, among whom probably the word *Sér*, which the *Greeks* applied to the *silk-worm*, signified *gold*; a sense which it now bears in *Tibet*. That the *Hindus* were in early ages a *commercial* people, we have many reasons to believe; and in the first of their sacred law-tracts, which they suppose to have been revealed by MENU many *millions* of years ago, we find a curious passage on the legal *interest* of money, and the limited rate of it in different cases, with an exception in regard to *adventures* at *sea;* an exception which the sense of mankind approves, and which commerce absolutely requires; though it was not before the reign of CHARLES I. that our own jurisprudence fully admitted it in respect of maritime contracts.

We are told by the *Grecian* writers, that the *Indians* were the wisest of nations; and in moral wisdom they were certainly eminent. Their *Níti Sástra*, or *System* of *Ethics*, is yet preserved; and the Fables of VISHNUSERMAN, whom we ridiculously call *Pilpay*, are the most beautiful, if not the most ancient, collection of apologues in the world. They were first translated from the *Sancrit*, in the *sixth* century, by the order of BUZERCHUMIHR, or *Bright as the Sun*, the chief physician and afterwards *Vezír* of the great ANU´-

SHIREVA'N, and are extant under various names in more than twenty languages; but their original title is *Hitópadésa*, or *Amicable Instruction;* and, as the very existence of ESOP, whom the *Arabs* believe to have been an *Abyssinian*, appears rather doubtful, I am not disinclined to suppose that the first *moral fables* which appeared in *Europe* were of *Indian* or *Ethiopian* origin.

The *Hindus* are said to have boasted of *three* inventions, all of which, indeed, are admirable; the method of instructing by *Apologues;* the *decimal scale*, adopted now by all civilized nations; and the game of *Chess*, on which they have some curious treatises: but, if their numerous works on Grammar, Logic, Rhetoric, Music, all which are extant and accessible, were explained in some language generally known, it would be found, that they had yet higher pretensions to the praise of a fertile and inventive genius. Their lighter poems are lively and elegant; their epic, magnificent and sublime in the highest degree. Their *Puránas* comprise a series of mythological histories, in blank verse, from the *Creation* to the supposed incarnation of BUDDHA; and their *Védas*, as far as we can judge from that compendium of them, which is called *Upanishat*, abound with noble speculations in metaphysics, and fine discourses on the being and attributes of GOD. Their most ancient medical book, entitled *Chereca*, is believed to be the work of SIVA; for each of the Divinities in their *Triad* has at least one *sacred* composition ascribed to him. But as to mere human works on *History* and *Geography*, though they are said to be extant in *Cashmír*, it has not been yet in my power to procure them. What their *astronomical* and *mathematical* writings contain, will not, I trust, remain long a secret: they are easily procured, and their importance cannot be doubted. The philosopher whose works are said to include a System of the Universe, founded on the principle of *Attraction* and the *central* Position of the Sun, is named YAVAN ACHA'RYA, because he had travelled, we are told, into *Ionia*. If this be true, he might have been one of those who conversed with PYTHAGORAS. This at least is undeniable, that a book on astronomy in *Sanscrit* bears the title of *Yavana Jática*, which may signify the *Ionic Sect*. Nor is it improbable, that the names of the Planets and *Zodiacal* Stars, which the *Arabs* borrowed from the *Greeks*, but which we find in the oldest *Indian* rocords, were originally divised by the same ingenious

and enterprizing race, from whom both *Greece* and *India* were peopled; the race, who, as DIONYSIUS describes them,

——' first assayed the deep,
' And wasted merchandise to coasts unknown,
' Those who digested first the starry choir,
' Their motions mark'd, and called them by their names.'

Of these cursory observations on the *Hindus*, which it would require volumes to expand and illustrate, this is the result: that they had an immemorial affinity with the old *Persians*, *Ethiopians*, and *Egyptians;* the *Phenicians*, *Greeks*, and *Tuscans;* the *Scythians* or *Goths*, and *Celts;* the *Chinese*, *Japanese*, and *Peruvians;* whence, as no reason appears for believing that they were a colony from any one of those nations, or any of those nations from them, we may fairly conclude that they all proceeded from some *central* country, to investigate which will be the object of my future discourses; and I have a sanguine hope that your collections, during the present year, will bring to light many useful discoveries; although the departure for *Europe* of a very ingenious member who first opened the inestimable mine of *Sanscrit* literature, will often deprive us of accurate and solid information concerning the languages and antiquities of *India*.

XXVI.

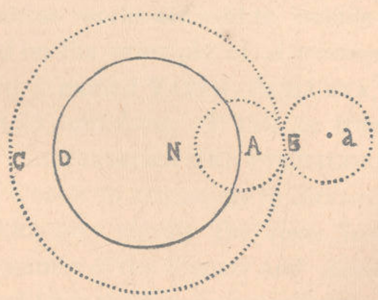
CORRECTIONS OF THE

LUNAR METHOD OF FINDING THE LONGITUDE.

BY MR. REUBEN BURROW.

The intent of the following remarks is to point out an error in the usual practice of making the Lunar Observations, and another in the Method of Computation.

It is well known that a little before and after the conjunction, the whole hemisphere of the moon is visible, and the enlightened crescent seems to extend some distance beyond the dusky part. Now, having determined the longitude of a place from the eclipses of Jupiter's satellites, I took several sets of distances of the moon's limb from a star near the time of the conjunction, both from the bright and the dusky parts of the circumference, and having calculated the results, I found that those taken from the dusky part were much nearer the truth than the others. The nature of the error evidently shewed, that the star had really been at some distance from the limb when it appeared to be in contact with it; and, as the error was a considerable part of a degree, I saw it would be of consequence to discover the cause of it; which, however, was obvious enough from NEWTON'S principles, and may be explained as follows.



Let AD be the diameter of the moon, and A the centre of a

star in contact with the moon's limb: now, as the enlightened part of the moon evidently appears to extend beyond the dusky part, let the concentric circle BC represent the moon's limb thus apparently magnified, and suppose the star to be equally magnified; then with the centre A, and the distance DC describe a circle, which consequently will touch the moon's apparent circumference inwardly; now, as this last is a consequence of supposing the centre of the star to touch the circumference of the moon, exclusive of the deception, it follows, that *the proper method of taking the distance, is to make the star appear to touch the moon inwardly.*

But all the writers on this subject have particularly directed that the star be made to touch *outwardly:* let B, therefore, be the point of contact, and *a* the centre: the error then is Aa, or the sum of the apparent increase of the moon's radius and the apparent radius of the star: this quantity, it is evident, will make a considerable error in the result; and errors arising from this source are the more to be attended to, as they are not of a kind to be lessened by increasing the number of observations. The same reasoning is applicable to the sun and moon with very little alteration.

The distance of the moon from the sun or a star, at each three hours, is given in the Nautical Ephemeris, and the method of inferring the time for any intermediate distance, is by simple proportion: this would be just if the moon's motion was uniform: but as that is not the case, the velocity should be taken into the account, as well as the space, in determining the time, taken by the moon to move any given distance; and the proper measure of the velocity is such a quantity, as has the same ratio to the space described, as three hours have to the time that has been actually taken to move the given distance: to find this quantity correctly, would require interpolation, but it will be sufficient in practice to find the time first by the common method, and then to correct the interval for three hours to that time, by taking a proportional part of the second difference of the moon's distance at the beginning of each three hours; supposing the first differences to answer to the middle of each interval.

The last correction, though not so considerable as the first, will often bring the result nearer to the truth by three, four, five, or six miles, and sometimes more, which in geographical determinations is of consequence; and, by paying attention to those and some other causes of error, which shall be pointed out hereafter, the results in general will be much nearer to the truth than is usually imagined. It is common to throw blame on the imperfections of the Lunar Tables, but it would be much more properly applied to bad instruments and bad observers.

THE END OF THE FIRST VOLUME.

MEMBERS

OF THE

ASIATIC SOCIETY,

From 15 January 1784 to 15 January 1789.

THOSE MARKED † ARE DECEASED.

PATRONS.

THE RIGHT HONORABLE CHARLES EARL CORNWALLIS,
KNIGHT OF THE GARTER, GOVERNOR GENERAL,
&c. &c. &c.

SIR JOHN MACPHERSON, BART.
THE HONORABLE CHARLES STUART,
JOHN SHORE, ESQ.
} *Members of the Supreme Council.*

PRESIDENT,

SIR WILLIAM JONES, KNIGHT.

SECRETARY,

JOHN HERBERT HARINGTON, ESQ.

A.
* David Anderson, Esq.
* Lieut. James Anderson.

B.
* Francis Balfour, M. D.
* Geo. Hilaro Barlow, Esq.
Robert Blake, Esq.
Sir Charles Blunt, Bart.
Rawson Hart Boddam, Esq.
Charles Boddam, Esq.
* John Bristow, Esq.
* Ralph Broome, Esq.
* Reuben Burrow, Esq.

C.
* Gen. John Carnac,
* Sir Robert Chambers, Knt.
* William Chambers, Esq.
Joseph Champion, Esq.
* Charles Chapman, Esq.
Major Charles Chatfield,
Lieut. Robert Colebrooke,
William Cowper, Esq.
* Burrish Crisp, Esq.
John Crisp, Esq.
* Charles Croftes, Esq. †

D.
Thomas Daniell, Esq.
Samuel Davis, Esq.
* Major Wm. Davy, †
* Jonathan Duncan, Esq.

F.
John Farquar, Esq.
John Fleming, Esq.
Capt. Thomas Forrest.
* Fancis Fowke, Esq.
Lieut. Charles Fraser,
Lieut. Col. James Fullarton.

G.
John Gilchrist, Esq.
* Francis Gladwin, Fsq.

* Thomas Graham, Esq.
Charles Grant, Esq.
James Grant, Esq.
H.
* Lieut. Charles Hamilton,
Lieut. Alexander Hamilton,
James Hare, M. D.
Warren Hastings, Esq.
Edward Hay, Esq.
Wm. Nath. Hewitt, Esq.
Lieut. Isaac Humphries.
Osias Humphrys, Esq.
William Hunter, Esq.
Mr. Justice Hyde.
J.
Richard Johnson, Esq.
K.
Richard Kenneway, Esq.
Capt. John Kenneway,
Capt. Wm. Kirkpatrick.
Doctor Kœnig. †.
L.
* Thomas Law, Esq.
Capt. Herbert Lloyd.
M.
Colin Macaulay, Esq.
Ensign Alexander Macdonald,
Col. Allen Macpherson.
Charles Ware Malet, Esq.
William Marsden, Esq.
Bartholomew Marsh, Esq.
Charles George Meyer, Esq.
* Nathaniel Middleton, Esq.
Lieut. Percy Monck, †
Edmund Morris, Esq.
Col. John Murray.
P.
* John David Paterson, Esq.
Col. Tho. Deane Pearse,
George Perry, Esq. †
Lieut. Col. Antony Polier.
R.
Henry Richardson, Esq. †
John Royds, Esq.
S.
Robert Saunders, Esq.
* Capt. Jon. Scott.
Capt. Wm. Scott.
Capt. Rd. Scott.
Peter Speke, Esq.
John Stables, Esq.
T.
John Taylor, Esq.
Gov. Isaac Titsingh.
Hen. St. John Tucker, Esq.
Lieut. Samuel Turner.
V.
* Henry Vansittart, Esq. †
W.
Lieut. Col. Henry Watson, †
Edward Wheler, Esq. †
Lieut. Francis Wilford.
* Charles Wilkins, Esq.
Z.
John Zoffani, Esq.

APPENDIX

TO THE

FIRST VOLUME

OF

ASIATIC RESEARCHES.

A

METEOROLOGICAL JOURNAL,

Kept by Colonel T. D. PEARSE, *from* 1st *March*, 1785, *to* 28*th February*, 1786.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	March 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.	Inches.	
	h. m.										
	22.49	☽ L. Q.									
3											(a)
6	7.15A	29,963		77		thin	3	SSW	1		(b)
7	3. P	29,915		79		thin	5	SSW	3		(c)
	6.30P					thick thund.	10	SSW	3		
8	7.30A	30,00		76		ditto	9	SSW	2		(d)
	7. P					thick	10				
	8. P							NW			
9	7. A	30,032		75,5		thick thund.	8	NW	1		(e)
	1.55P	29,97		79,5		none					
	16.27	☽ New									
10	4.50P					thick thund.	9	NW	6		
	5.39P					ditto	8	S	3		
	6.15P	29,95		76,5		ditto	8	S	4	,142	(f)
11	7. A	30,00		70				S by W	1		
12	6.35A	29,95		79				S	1		(g)
13	6. A	29,85		79		thin	2	S by E	1		(h)
	2. P					thick	4	S	3		
	4. P					thick thund.	8	S by E	3		
	5.2 P	29,77		80,5		ditto	9	S	5	,259	
	5.30P										
14	7. A					thick	6	SSE	2		
	2.20P	29,816		83		ditto	9	SSE	2		
15	6.45A	29,854		79,5				S by E	1		(i)
	8.25P					thick thund.	9	N	5		
16	7.40A	29,873		78		ditto	10			,022	(k)
	2.20P	29,813		82		thick loose	8	SSW	4		
	12.52	☽ F.Q.									
17	7.15A	29,887		80		thick	5	SE	1	,039	(l)
	2.30P	29,828		84		ditto	4	SSE	2		
								Carried forward,	-	,462	

(a) Last Friday the fog was excessive, and did not begin to clear till nine. Saturday the same. Sunday it began to clear about 7.

(b) The Fog is gone off to-day already: it was but slight.

(c) Much lightning in the NW. and distant thunder.

(d) Much lightning in the NW. A puff from the NW. but without rain or thunder.

(e) There was a very small sprinkling of rain just now.

(f) In the morning we had a thick fog, which formed into clouds, and went over to the N. and at 2 masses were formed there: from whence at 4″50 we had a storm, which was over in half an hour; and at *Dumdum*, about 10 miles off, they had heavy hail.

(g) Fog so thick that an object at a 100 yards is invisible.

(h) 6. A. Foggy. A storm will come on in the evening. 4. P. Distant thunder. 5.2 P. We have had a furious storm of hail, with thunder and lightning, and SW to SSE 6. 5.30 P. Loud thunder still continues in the ENE. where the mass now is.

(i) 6.45 A. Every thing hidden in fog, which will produce a storm at night. 8.25 P. Much lightning, and the expected storm coming on.

(k) 7.40 A. The thunder rolled all night: excessive lightning.

(l) 7.15 A. A storm began to gather about 5 P. and we had much lightning about 10. Between 12 and 1 it began, and the wind very violent. The thunder close, and so heavy, that it jarred the whole house like an earthquake. 2.30 P. It has been very gloomy at times all day.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	March 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
								Brought forward,		,462	
18	6. A	29,915		80		thin	3	S	1		
	2. P	29,85		86		loose	3	S	4		
19	2.20P	29,813		84				W by S	2		
20	1.30P	29,833		85		thin	9	SSW	3		
21	6.15A	29,813		81		thin	2	SW by S	2		
	2. P	29,80		86		thick & thin	5	S by W	4		
22	6.30A	29,825		82		thick loose	10	SW by S	3		(m)
	2. P	29,837		86		thick	3	SW by S	5		
23	2. P	29,784		85,5		thin	7	SW by S	3		(n)
	7.45					thick thund.	10	SSW	5	,084	
24	8. A	29,87		81,5		thick	7				(o)
	2. P	29,825		85		thick thund.	10	W by S	2		
	9. P									,001	
	h. m.										
	16.02	☽ Full									
25	6.15A	29,859		82		thick	4	SSE	2		
	2. P	29,866		86		none		S	3		
26	5.45A	29,915		82		thick loose	10	S	1		(p)
	2.15P	29,87		86,2				S	4		
27	7.15A	29,865		82		thick	10				
	2.15P	29,785		87				S	2		
28	6.45A	29,795		81				S	1		(q)
	2.10P	29,798		87,5				SSW	4		
29	6.45A	29,862		81,5		thin	2	S½W	1		(r)
	2.15P	29,830		87,0				SSW½W	3		
30	6.45A	29,822		81,5		thin	5	S½E	1		(s)
	1.30P	29,848		83,5		thick	10	NE	1		
31	7.15A	29,862		79,0		ditto	10	NNE	1	,007	(t)
	2. P	29,797		83,0		ditto	9	NNW	1		
								TOTAL IN MARCH,	-	,554	

(m) Great appearance of approaching rain and storms.

(n) 8. A. The morning was very cloudy, and the wind strong; it presaged a storm; and I still expect one before midnight. At sun-set it threatened, and at 7 P. the lightning began to be vivid in the WNW. It rained for about ten minutes. The thunder was very near.

(o) 8. A. The wind began about 11. P. and raged till past 1 o'clock with uncommon violence. 2. P. Excessively gloomy. 9. P. At 7 we had a thunder gust which was soon over, with a sprinkling only.

(p) 5.45 A. The clouds began to collect at 8 last night and are very thick. 2.15 P. The clouds continued very thick till past 10, and were not dispelled till past 1.

(q) 6.45 A. Excessively thick fog. 2.10 P. The true along-shore wind, which disorders the whole frame.

(r) 6.45 A. Foggy. Last night the clouds were thick 10 at 11 P.

(s) 6.45 A. Foggy. It has been extremely gloomy ever since 7 o'clock, and about noon we had a few drops of rain.

(t) 7.15 A. We had a small shower of rain about sunrise, and there has been more at a distance from the feel of air.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	April 1785. Miscellaneous.
1	6.45A	29,866		79,5		thick thund.	10	WNW	2		(a)
	2.10P	29,816		82		thick	10	SE	1		
	10.16	☽ L. Q.									
2	6.45A	29,828		77				E½S	1		
	2. P	29.777		83,7		thick scat.	3	WNW	3		
3	6.45A	29,765		79				S by W	1		
	2. P	29,711		85,5		none		WNW	2		
4	7. A	29,785		80				SE by S	1		
	2. P	29,750		86				WNW	1		
5	6. A	29,763		78		thick	2	SE	2		(b)
	1.45P	29,760		86,7		thick gather.	3	S by E	2		
6	6.30A	29,76		80,5		thick	5	E	3		(c)
	2. P	29,748		88		ditto	1	SW½S	4		
7	7. A	29,82		80							
	2. P	29,79		87,5				SSW	5		(d)
8	7. A	29,846		81,5		loose	4	S by E	2		(e)
	2. P	29,761		87,5	94			SW½S	4		
	1.39	☽ New									
9	6.30				81	thick loose	10	S	2		
	2. P	29,75		88,5	96,5			S by W	4		
10	7.45A	29,76		84		thick	9	SSW	5		
	2. P	29,718		88	92,2			SSW	5		(f)
	5.30P	29,708		87	88	thick	10	SSW	5		
11	6.40A	29,788		85	81,5	thin	7	SSW	2		(g)
	2. P	29,776		89,5	96,0	ditto	8	SW by S	3		
	6.15P	29,779		88	83,15	thick thund.	8	SSW	3		(h)
	8. P									,016	
12	7.15A	29,740			83						
	2.30P	29,765		90,5	100,5			NE	2		
13	6.30A	29,783		82	81	thick & thin	10	SW by S	2		
	10. P	29,818		84	83,5	thick	10	N	1	,002	(i)
14	7. A	29,820		83	85	ditto	9	S by W	3		
	2.30P	29,848		86	88	ditto	10	S	2		(k)
15	7. A	29,915	28	82	81	ditto	10	S½W	1		
	1,45P	29,90	22,5	85	92	ditto	10	NE	1		(l)
						Carried forward,			-	,018	

(a) We had a sprinkling rain to-day of half an hour's duration.
(b) Excessively thick haze.
(c) Last night the clouds were so heavy that they seemed to threaten a storm.
(d) There were flying clouds from 8 till 11 to-day, but all are gone.
(e) Yesterday evening there was a mass over *Calcutta*, and much lightning and some thunder, and this morning we had a fog.
(f) There will be a storm to-day. 5.30 P. Distant thunder. The bank is not yet formed.
(g) The wind was tempestuous the greatest part of the night, but we had not any rain. It is now foggy, and threatens.
(h) Yesterday there was every reason to expect a violent storm, but it went off from us. To-day there was but little expectation, and it now rains smartly, and there has been a great deal of thunder; and all this without any change of wind.
(i) We had a small shower at 1, and another just now. The wind was NE 2 all the afternoon.
(k) The wind changed suddenly just after last observation to the S again, and we had a very windy night. 2.30 P. It has been gloomy all day.
(l) A sprinkling rain in very distant drops. The wind of the night was of such a kind, that it prevented the possibility of sleeping.
The morning rain, and a like sprinkling since, could not be measured.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	April 1785. Miscellaneous.
								Brought forward,		,018	
16	7. A	29,95	15	80	82,5	thick	10	N	4		(m)
	8,15A	29,99	17,5	80	74	ditto	10	NE by E	3	,087	
	2.15P	29,893	29	80	80	ditto	10	NE	4		
	3.44P	☽ F. Q.									
17	7.15A	29,864	32	70,5	86	thick	10	E by N	4	1,314	(n)
	2.15P	29,79	43	78	75	ditto	10	S by E	3	,763	
	8.20P	29,828	44	78	74	thick loose	10	SE½E	3	,752	
18	6.15A	29,80	46	79,5	76	thick	9	SSW½S	1	,284	(o)
	2.15P	29,839	48,3	80,5	86	thick white sc.	4	NW	1		
19	7. A	29,913	50	80		thick loose	7				(p)
	2.15P	29,813	43,5	83,5	90	thick white	7	SW½S	2		
20	5.40A	29,8	43,5	79,5	76	thin	4	S by W	2		
	2.25P	29,792	42	86	90	thick loose	4	S	4		
	10. P	29,881	36,5	76,5	80,9	thick	10	NNE	3		(q)
21	6. A	29,812	40	76,9	73,5	ditto	3	SSE	3		
22	8. A	29,876	41	77	74	ditto	10	SW by S	3	,410	(r)
	2. P	29,785	36,5	82	89	scattered	2	SSW	3	,007	
23	5. A	29,750	50	79	77			SW	2		
	2.15P	29,760	46	86	93			S by W	2		
24	7. A	29,748	54	82,5	84			S	2		
	2. P	29,722	45	87,5	94	scattered	2	S by W	3		
	8-8 P	☽ Full									
25	6.30A	29,71	53,5	83	83			SSE	2		
	2. P	29,71	42	90,5	96,5	scattered	3	S½E	4		(s)
26	7.15A	29,740	47	84	85	ditto	3	S	2		(t)
	2. P	29,735	39	89	94	thick	9	S by E	4		
27	7. A	29,705	47,5	84						,220	(v)
	2. P	29,697	43	87,5	91	thick	9	S by E	4		
	7. P	29,711	43	83	86	thick thund.	10	NNE to	7		
	8. P							NNW		,170	
	9.45P							WNW	9	,270	
28	6.45A	29,713	40	81,5	78	none		SW by S	2	,013	(w)
	2. P	29,723	44	87,5	93			SW by S	2		
29	6. A	29,713	49	83,5	80,5	none		SW by S	2		(x)
	2. P	29,753	37	87,5	93			W by S	2		
30	7. A	29,79	50	83,5	84	none		SW by S	2		
	2. P	29,79	37,5	91	97,5	thick small scat.	2	SSW	4		
						TOTAL IN APRIL,			-	4,308	

(m) It has been a blowing cold night; wind northerly, and it sprinkles rain. 8.15 A. A heavy shower just over, and drizzling rain still continues. 2.15 P. We have had more sprinkling rain.
(n) About 6 yesterday it began to rain in drops; before nine it was smart rain. It has continued all night, and still rains. 2.15 P. It has rained incessantly all day. It still rains hard, and now the clouds begin to break a little. 8.20 P. It still sprinkles.
(o) It began to thunder at a great distance about 8, and by 12 it was near us; and this put an end to the rain before 3. A.
(p) The morning was foggy.
(q) A small shower of rain, and the wind changed from the S. to NNE.
(r) At 12. P. a mass formed in the NW. came on, and in a short time we had a storm without thunder. It sprinkles to-day. 2. P. Produce of the sprinkling.
(s) Very hazy and foul air.
(t) Lightning last night; and very foul air to-day.
(v) A regular northwester last night at 8. P. 7.P. Sprinkling rain begun. 8. P. the produce of the storm, which is abated: distant thunder. 9.45 P. A very severe storm just over, which begun about 8. 20. It still thunders.
(w) This was, with produce of a small shower about 10.30 P.
(x) The night very hot, and the air loaded with damp: the morning cool and pleasant.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	May 1785. Miscellaneous.
1	7.40A	29,813	47,5	84	86			SW	3		
	2.10P	29,762	32,5	90	98,5			W	3		
	6.22A	☽ L. Q.									
2	7.45A	29,750	47,5	84	86	scattered	3	SW	4		
	2. P	29,710	38	89	98	ditto	1	SSW	3		
3	6. A	29,712	45	83,9	82			SSW	2		
	2. P	29,720	38	89	95	none		SSW	4		
4	6. A	29,735	39	83,3	82			S by W	2		
	2.20P	29,780	36	88,5	93			SSW	4		
5	5.30A	29,745	43	83,5	81,5	loose	9	S by W	2		
	2. P	29,746	37	89	94	ditto	3	S by W	5		
6	5.30A	29,808	37	82	79,5			S by W	2		(a)
	2. P	29,800	32	88	94,5	thin	2	S by W	5		
	8.45P	29,997	28,5	82,5	78,5	thick thund.	10	NW by W	7		
	9. P	30,000	32,5	82	72	ditto	10	NW by W	3	,328	
7	5.30A	29,840	31,5	81,5	76,5	thin	8	NNW	1		
8	6. A	29,897	40	81	81	thick	5	S by W	1		
	2.30A	29,90	32,5	88	94	thick	3	SSW	4		
	10.25P	☽ New									
9	5.30A	29,875	44	81,5	80	thin	7	S	1		
	2. P	29,882	34	88	95,5	thick	6	SW by S	4		
10	7. A	29,867	41	82,7	84,6	thin	3	SW by S	3		
	2. P	29,843	32,5	88	95,5	thick	5	S by W	4		
11	7. A	29,810	40	83,3		thick & thin	10				
	2. P	29,783	31,5	89	97,5	thick scat.	2	SSW	4		
	7.30P	29,744	35,5	87,5	86,7	thunder	4	SSW	3		(b)
	7.47P	29,814		87		ditto	9	NW	5		
	7.55P	29,814	31	87	82	thunder	9	NW	7		
	8.25P	29,808	35	83	73	ditto	10	NW by W	2	,325	
	9. P	29,754	36	79,5	74	ditto	10	ENE	2		
12	5.40A	29,718	41	82,5	81	thick	10	S by W	2		
	2.20P	29,752	32	89	96			SSW	4		
13	7.30A	29,753	42	85	85	thin	7	S	4		
	2.20P	29,754	35,5	91,5	98,5	loose	8	S by E	3		(c)
14	5. A	29,785	35	82	78	thick	3	N by W	1		(d)
15	5. A	29,797	39	81,9	81,3	thin		E by S	2		
	2. P	29,765	26	90,5	96		2	NE	3		
	7.10P	29,752	24	88,7	88,3	thick thund.	9	W by S	3		(e)
16	6.15A	29,777	34	83	82,2	thin	2	NE	1		
	8.54A	☽ F. Q.									
	2. P	29,740	17,5	89	95,5	thick thund.	4	WNW	2		
								Carried forward,	-	,653	

(a) Much lightning last night, and a mass in N and NW. from whence we had a blast of wind at 10. P. 8.45 P. Sprinkling rain begun. 9 P. Very heavy thunder; a smart shower just over.

(b) A heavy thunder mass in NW. and much lightning, with distant thunder. 7.47 P. The wind just changed, and the mass reached the zenith. 7.55 P. Small rain begun. 8.25 P. Heavy rain over, small rain continues.

(c) A very oppressive heat to-day. The air does not carry off perspiration, and makes the whole body clammy and comfortless.

(d) The heat produced thunder all the afternoon till near 10, with squalls of wind from every quarter in turn, but without rain.

(e) The wind shifted about a quarter of an hour ago.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	May 1785. Miscellaneous.
								Brought forward,		0,635	
17	6.15A	29,810	32,5	80,5	80,7	thick	7	ENE	2		
	2.15P	29,785	25	89,5	98,5			SW by W	4		(f)
18	7.30A	29,868	37,5	82,2	84,5	loose	3	E by S	3	,057	(g)
	10.30A	29,895	36	85,8	87,7	thunder	10	SSW	4		
	11.5 A	29,886	36	81,7	78	ditto	10	ENE	3	,558	
	2.20P	29,813	38	85,	90	thick & thin	4	SE	3		
19	7.10A	29,850	37,0	80	78,5	ditto	5	NW by W	3	,003	(h)
	2.15P	29,763	30	85,7	94,5	scat. hard	2	WSW	3		
22	7.5 A	29,713	36	83,5	85,3			NE	2		(i)
	2.10P	29,677	28	90	95,5	thick	7	E	3		
23	7.30A	29,655	38	84	87	thin	3	NE by E	2		(k)
	2.10P	29,613	27,5	89,3	95	thick	6	NW	3		
24	7.55A	29,563	37	88	92			SW by S	4		
	9.22A	☽ Full									
	2. P	29,515	22	92,3	101,0	scattered	4	WNW	3		
	6.40P	29,502	21	91,5	91,5	thunder	8	N	3		(l)
	6.55P					ditto	8	SSE	5	,240	
25	7.40A	29,563	21	81,7	80,7	thin & thick	10	S by W	3	,303	(m)
	2. P	29,573	37	90	96	ditto	10	SSW	4		
	8.50P	29,592	33	80,5	74,8	thu. remains	10	S by E	3	,562	
26	7.50A	29,640	37,5	81	80	thin uniform	10	E by S	3	,026	(n)
	2.40P	29,616	35	86,5	93	thin	10	SSW	3		
27	7. A	29,650	45	84	84	thin	10	SSW	3		
28	7.30P									,336	(o)
	11. P	29,765	40	82	76	thunder	10	W by N	4		
29	8.30A	29,742	38	84	86,5	scattered	2	SSW	3	,082	
	2.23P	29,696	39	88,3	92,5	thick	7	SSW	5		
	8.10P	29,703	43,5	86	86	thunder	10	S	0		
	8.25P	29,757	43,5	86	86	ditto	10	N by E	1		
30	6.40A	29,710	47	84	83,5	thin & thick	5	SW by W	2	,173	
	10.40P	29,663	44	86,5	85,5	thunder	10	SSW	3		(p)
31	7.40A	29,641	46	86,3	80	ditto	10	ESE	2	,697	(q)
	11.57A	☽ L.Q.									
	2.20P	29,590	44	87	93	thick	7	SW	3		
								TOTAL IN MAY,	-	3,690	

(f) The clouds were 6 about 10, but are all gone.

(g) A small thunder shower at 7. P. yielded the water. It came from ENE. 10.30 A. A thunder shower just over of about ten minutes duration. 11.5 A. A very heavy thunder storm just over: it began immediately after last observation.

(h) We had another storm in the night, with a sprinkling of rain.

(i) We had a mass of thunder clouds from NNW. last night without rain. 2.10 P. The heat very oppressive.

(k) We were almost suffocated last night. I could not close my eyes till past 4.

(l) It rains, and there has been distant thunder. 6.55 P. Thunder close and loud; heavy rain.

(m) Between 11 and 12 the storm came on again heavier than before. 2. P. The air does not carry off perspiration, and therefore leaves the body clammy. 8.50 P. At 7 we had a most furious storm from N 8: a torrent of rain, but of short duration; and all has been quiet this hour.

(n) After last observation, it began to rain small rain which continued some time.

(o) We had in town a very violent north wester, and it reached the gardens, where it produced this rain. 1.11 P. The day has been hot, and the sky covered with thin clouds; since 8 they have collected, and we had much lightning in the WNW. and now the storm has reached us.

(p) Much lightning in the NNE. and distant thunder.

(q) It sprinkled rain soon after last observation, but at 5. A. we had a tremendous thunder-storm.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	June 1785. Miscellaneous.
1	7.10A	29,570	47	84	86,5	thunder	5	SSW	3		(a)
	2.30P	29,525	37	89	103,0			SSW	3		
	8.40P	29,612	41	88,5	88	thunder	10	WNW	5		
	9.15P	29,637	38	85,2	77	ditto	10	SW½W	4		
2	7. A	29,585	45	84	85	thick	8	S by E	3	,665	(b)
	2.20P	29,590	42	84	88	thick	10	S by E	3		
3	6.40A	29,565	46	82	83	thin	3	SE	3		
4										,168	(c)
5										,154	(d)
6	8 A	29,592	48	84	87	thick	6	ESE	2		(e)
	7.38A	☽ New									
7	8.20A	29,616	51	83	84,5	thunder	10	SSE	3	,100	(f)
8	8.20A	29,621	52	83		thick	10	SE by S	4		
	2.20P	29,580	48	83,5	88	thick	10	S by E	3	,503	(g)
9	8.40A	29,657	47,5	80	77	thick loose thun	10	SSW	3	,700	(h)
	1.50P	29,625	50	81	79,5	ditto	10	SSE	4	,469	
10	8.15A	29,655	55	83	87	thick scat. loose	5	S by E	4		
	2.15P	29,617	52,5	83,5	86	ditto	10	S by W	4	,036	(i)
11	7.30A	29,655	57,5	83	88,5	scattered	4	S by E	3	,056	(k)
	2.20P	29,633	48,5	88	95	scattered	6	S by E	4		
12	7.30A	29,653	53,0	84	87,5	loose	7	S by E	4		
	2.23P	29,580	45,0	86	96	loose	5	S	4		
13	5.35A	29,593	54	83	82	thin	5	S	2		
14	5.25A	29,500	50	83	81,5	thin	5	S	2	,478	(l)
	2.28A	☽ F.Q.									
15	7.25A	29,420	51	83,5	82,5	thick & thin	9	NW	3	,006	(m)
	2.20P	29,367	53	82,5	80,5	thick	10	NW	4	1,317	
16	7.40A	29,472	52,5	80,5	78	thick loose	10	WSW	3	1,700	(n)
	2.15P	29,450	53	83	87	thick	10	SW by S	3	,188	
17	6.15A	29,504	55	80	78	thick	10	SW by S	3	,477	(o)
18	6.35A									1,736	(p)
	8.15A	29,630	55	79	75,8	thick loose	10	S by E	3	,200	
	2.15P	29,581	55	82,5	85	thick	10	S by E	3	,150	
								Carried forward,	-	10,104	

(a) There was a great deal of thunder last night. About 2 it was most oppressively sultry, being a dead calm. 8.40P. After excessive lightning in the NW. the mass has reached ius, and the storm is begun. 9.15 P. It still rains smartly: the thunder now approaches, but ws very far off. This looks more like the rains than any thing we have yet had; and if the ind veer to the south we may reasonably expect them.

(b) Produce of last night's storm.

(c) Produce of a thunder storm at noon.

(d) Do. and at noon also.

(e) There was a storm at noon, and at dinner time, and the evening was fine.

(f) It has rained this morning with thunder; this water is yesterday's and to-day's.

(g) We had rain yesterday, and twice to-day, and this is the produce of all.

(h) It began to blow and thunder and lighten at 12″30, and before 1. A. we had a heavy shower. Ever since it has rained more or less, with much thunder. 1.50P. It has rained without ceasing, more or less, ever since morning.

(i) We have had a thunder shower from SW.

(k) There was a shower at day-break.

(l) At 6. P. yesterday a heavy shower from NW. gave this water: and there was only a sprinkling in town.

(m) There was a small shower about 3, and another about 9 P. 2.20P. Heavy showers began about 9, and still continue with short intervals.

(n) It has rained ever since last observation at times only sprinkling, at others smartly; and now moderately. 2.15 P. The rain abated gradually, and ceased before noon.

(o) At 9. P. a thunder storm from the W. brought on rain again, and it continued till morning.

(p) It was running out throgh the air-hole. How long it had done so I cannot tell; but it rained all day yesterday: drizzling and at times barely perceptible; heavily about 6 P. and drizzling till near day; then hard again; and now it rains smartly as it did when the water was measured, and there is some in the measure besides. 2.15 P. The rain ceased about 10, and the sun shone at noon.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	June 1785. Miscellaneous.
								Brought forward,		10,104	
19	8. A	29,558	58	81,5	84,3	scattered	6	SSW	2	,375	(q)
	2.20P	29,528	52	83	82,8	thick	10	W½N	2	,156	
20	8. A	29,567	50	81,5	84,5	thin & thick	7	SSW	3	,004	(r)
	2.10P	29,520	50	81,3	84,5	ditto	6	S½E	4	,332	
21	7.35A	29,549	53	80	78,5	loose low thick	10	S½W	2	,132	(s)
	2.15P	29,522	48	83	89,7	scattered	5	SW by S	4	,001	
22	7.25A	29,552	53	81,5	81,5	thick	10	W	2	,007	(t)
	8.11A	☽ Full									
	2.25P	29,525	51,5	83	90,5	thick scat.	7	S by W	2		
23	8.50A	29,539	55	82	79,5	loose	10	NW	1	3,250	(v)
	2.20P	29,521	56,5	82	82,8	loose	10	S	3	,076	
	6.20P	29,498	56			thick	10	S by E			
	6.55P	29,516	56	83		thick loose low	10	S by E			
24	6.20A	29,510	58,5	81,5	81,5	thin	10	SE	3	1,778	(w)
	11.45P	29,524	58	82	81	thick scat.	8	SE	3	,068	
25	7.20A	29,512	59	83	84,5	thick	8	ESE	4		
	2.40P	29,472	53	83	92,5	thick scat.	5	SSW	2		
26	7.35A	29,508	56,5	83,5	83,5	thick	7	WNW	2	,073	(x)
	2. P	29,482	52,5	84	87	thick	9	SW	2		
	6.20P	29,471	56	83	83,5	thick	5	SW by S	3	,507	
27	7.15A	29,490	59,5	84	84,5	thick low	10	SSW½W	3		(y)
28	9. A	29,472	57	81,5	79,5	thick low loose	10	SE	3	1,000	(z)
	2.15P	29,428	58,5	83,5	87,5	thick low	10	SW by W	3	,367	
29	7.20A	29,446	56,5	83	86	thick loose gat.		S by W			(aa)
	2.25P	29,406	51,5	85	91	thick	6	S by W½W	3		
	4.21P	☽ L.Q.					9		3		
30	7. A	29,224	5[illegible],5	83	82	thick	8	S½W	3	,169	(bb)
										,213	
										18,611	
										7,450	(cc)
								Total in June,	-	26,061	

(q) Between 10 and 11 P. there was a heavy shower, that produced 2 of this quantity; the rest fell this morning. 2.20 P. A shower just over.

(r) This was the end of the last shower. 2.10 P. A heavy shower about 11 o'clock in the forenoon.

(s) Misty rain. 2.15 P. It cleared soon after last observation.

(t) A shower about 4 o'clock this morning.

(v) About 1 it began to rain in torrents. At ½ past three 2 inches were measured. At 6½ this morning a third; the rest fell since, and it still sprinkles. There was excessively heavy thunder, with most vivid lightning, at 3, though but little wind. 2.20 P. Drizzling rain all day. 6.55 P. A sprinkling about 6.35. Distant thunder.

(w) Soon after last observation it began to drizzle, and the mercury rose, but in a short time after fell again. The rain continued till 1 in the morning, and for about two hours was very heavy. 11.45 P. This fell in the course of the day, about 9 and again 2. P.

(x) A small shower at 7. P. yesterday, and another just over. 2. P. A shower in the forenoon. 6.20 P. A shower about 5. P. and the above produced this water.

(y) The night was clear, and stars bright.

(z) It was very gloomy at 9, with much lightning. About midnight it began to rain; towards morning more, and at 6. A. heavily, and ever since smartly, and so it still rains. 2.15 P. It rained till near noon, and is about to rain more.

(aa) The morning has been bright.

(bb) The rain fell about 8. P. last night in a smart shower from SW wind 5. ,213 This rain fell about 6. P. and was heavy for the time it lasted.

(cc) Add this for the overflowing on the 10, 18, 23 and 24, when the garden was all under water.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	July 1785. Miscellaneous.
1	2.50P	29,436	53	85	92	thick	4	E ½ N	3		
2	7. A	29,483	55,5	83	85	thick	6	E ½ N	4	,148	(a)
	0.10P	29,510	47,5	83	84	thick loose low	10	ESE	5		
3	9.20A	29,512	55,5	83	84	thick loose	6	E ½ N	6	,300	(b)
	2.20P	29,480	55,5	83,3	85	ditto	7	S by E	4	,450	
4	8.12P	29,556	54,5	82	84	thick	10	SW	4	,069	(c)
5	9.30A	29,586	56,5	83	81,5	thick loose	10	WNW	3	,900	(d)
	2.30P	29,528	56	82	83	thick hard	10	SW by S	2	,017	
6	6-22A	☽ New									
	7.10	29,486	57	81	78,5	thick loose	10	NW	2	,923	(e)
	2.45P	29,415	58	82	80,5	loose	10	SW by S	3	,150	
	7. P					ditto	10	SW	7	,500	
7	6.40A	29,40	58	81	78,7	loose	9	SW ½ S	3	,359	(f)
9										,300	(g)
										,186	
	8. A	29,60	61	82	84	thin	6	SE	2		
10	7. A	29,654	62	82	83,5	thick thun col.	5	S	4		
	0.15P				94	ditto	7	S	4		
	2. P	29,610	62	83,5	88,7	thick thund.	8	SSE	4		(h)
11	7.30A	29,662	59	83	88	thick scat.	8	S ½ E	2		(i)
12	2.30P	29,556	56	83,5	90,7	thick	10	SW by S	3	,036	(k)
13	7.30A	29,516	58	83	82	loose	10	SW by S	2	1,500	(l)
	2.30P	29,460	58	83	86	thick	10	SSW	3	1,223	
14	6.40A	29,494	55	81,3	80,7	thick	10	S by W	3	,016	(m)
	7-28A	☽ F. Q.									
								Carried forward,	–	7,077	

(a) The night very close and suffocating. After 3 in the morning, thunder and lightning, and a little wind with rain made it possible to sleep. 0.10 P. A heavy storm came on, the wind was NE the greatest part of the forenoon, now has changed.

(b) It rained all the afternoon, and till near 8.P, and is about to rain again. 2.20 P. Flying showers, five or six since last observation.

(c) The produce of several drizzling flying showers after last observation.

(d) About 6 it began to rain, and there were ,400 at nine. It has rained almost all night, and there were ,500 drawn off just now; it still drizzles. The lightning fell close to the bazar, that is about ⅓ of a mile from the house, but did not hurt any body.

(e) Rain in the night with lightning. Heavy rain about day-break, and the shower but just over. 2.45 P. Showers all the forenoon, and now set in. 7. P. It has been a very rainy, windy afternoon, and it still continues so.

(f) It has been tempestuous at times, and rained in flying showers all night.

(g) The 7th in the evening. ,186. The 8. to 2. P. when it ceased.

(h) It has thundered at a distance.

(i) There was lightning about 10. P. but not any rain.

(k) This rain fell yesterday about 4. P. it has not rained since.

(l) It rained heavily last night about 11, and it has just begun again gently. 2.30 P. The rain continued till past one.

(m) The rain fell in the evening about six.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	July 1785. Miscellaneous.
								Brought forward,		7,077	
15	8.40P	29,660	58,5	83	87	thick	9	SW	4	,072	(n)
16	2.40P	29,586	54	85	91	thick	10	SW by W	3		
17	0.45P	29,553	55	85	92	thick	7	SW by W	3	,184	(o)
18	2.20P	29,442	54	83,3	85	thick	10	WSW	5	,340	(p)
19	7.20A	29,468	57	81	78	thick loose	10	SW by W	3	,291	(q)
21	10.20P	29,596	60	83	82,5	thin	5	S ½ E	3	,430	(r)
22	5-20A	☽ Full									
	6.15A	29,586	64	82	81	thick loose fog.	9	S	2		
24	7. A	29,682	61	80,9	81	thick	9	E by N	4	,110	(s)
	2.20P	29.650	55	84	90	thick	3	ENE	2	,014	
25	5 45A	29,675	58,5	81	80	thick	3	SSE	2		
26	8.50A	29,686	54	84	87.5	thick & thin	8	SSW	2		
	2.30P	29,627	51	85,6	91,5	thick	9	SE by S	3		(t)
	8.25P	29,636	54	84	80	thick	8	NW by N	2	1,700	
27	7.20A	29,641	56,5	83	87	thick	5	S	1	0,007	(v)
	2.20P	29,613	52,5	84	89,5	thunder	10	SE	4	,025	
28	6.30A	29,612	58,5	82	84,5	loose	3	S by E	2		
	9-11A	☽ L.Q.									
29	1.20P	29,562	52,5	86	91,5	thick	8	ENE	3		
30	8,10A	29,580	56,5	83,9	87	thick	9	SSE	2		
	2.40P	29,512	51,5	86,5	93	thick	8	S by W	3		
31	7.15A	29,528	56	82,3	80,7	thick	9	NE ½ E	3		
	2. P	29,370	58,5	80	79	thick	10	S	4	,226	(w)
										,016	(x)
										10,392	
								Over flowing,		1,700	(y)
										12,092	
								TOTAL IN JULY,	–	12,192	

(n) This rain fell the 14th in the night, and not any since.

(o) Rain yesterday evening, and in the night before 3 o'clock.

(p) A very tempestuous night, and rain to-day also.

(q) Sprinkling rain.

(r) ,4 fell on the 19th, the rest yesterday. Not any to-day. The forenoon was foggy and cloudy, very close and hot.

(s) This fell the day before yesterday. 2.20 P. A thunder shower at 11. Excessively high tide to-day.

(t) A shower just come on. 8.25 P. Two very heavy showers since 7. P. about which time it began with very heavy thunder from SE, and varied to N W.

(v) The remainder of last night's storm, which was over when the last observation was entered. 2.20 P. A thunder shower about 12, and it now thunders and more is coming on.

(w) It rains hard. The wind has veered all round the compass at least twice since morning, with flying shower of small rain and distant thunder, of deep and heavy sound.

(x) The wind increased to 8, and blew so far above an hour with rain, of which this is the produce.

(y) Add this for overflowing on the 26th, and it could not be less.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	August 1785. Miscellaneous.
1	6. A	29,490	60	81	79,3	thick	3	S by E	3		
2	6.10A	29,515	62	81,7	81,3	thin & thick	4	SSW	2	0,005	(a)
	2. P	29,515	57	83,2	88,7	thick thund.	9	SE by S	3		
3	5.40A	29,561	65	81,5	81,5	thin	2	S by E	2	,715	
	11. A										(b)
4	8. P	29,544	57	83	83	thick	5	SE by E	2		(c)
5	7-26A	☽ New									
	11. P	29,578	60	82,2	80,9	thin	6	SE	2	,719	(d)
6	6.30A	29,528	64,5	80,9	80,9	thick	9	E by N	2		
	11. P	29,588	62	82,3	80,3	thin	5	SW by S	2	,271	(e)
7	8.30A	29,580	63	82,3	83	thick	10	W by N	2		
	2.15P	29,520	61,5	83,7	90,2	thick	9	SSE ½ E	3	,066	(f)
	11. P	29,600	64	83,5	81	thick	10	S by W	2	1,000	
8	6. A	29,592	62	80,5	78,5	thick	10	S ½ W	2	,546	(g)
9	7.50A	29,750	63,5	80	79	thick	10	SW	2		(h)
	0.50P	29,735	64	80	86	thick hard	8	S	2	,293	
10	6.20A	29,700	64,5	80,5	81	thick	3	S by E	2		
	1.15P	29,66	58,5	84,3	90,3	thick thund.	6	SSW	3		
11	9. A	29,638	67,5	83	86,3	thick	5	SSW	3		
	2.15P	29,574	61,5	86	92,5	thunder	7	S by W	3		
12	7.50A	29,608	66,5	83,6	87,3	thick	8	S ½ E	2		
	2.15P	29,564	56	86,5	91,5	thunder	10	S ½ W	2	,070	(i)
13	7. A	29,606	65	81,5	82,2	thick	9	WNW	3	,014	(k)
	11-24A	☽ F.Q.									
	2.15P	29,550	63,5	82,8	86,5	thick thund.	10	S by E	2	,400	
14	7.45A	29,544	64	81,5	82	thick	10	NW	2	,196	(l)
	2.20P	29,466	67	84,5	89,5	thick	8	E ½ N	1		
15	7.45A	29,498	65	82,7	84	thick	6	SSE	3		
	2. P	29,468	61,5	83,5	86	thick thund.	10	E by N	2	,143	(m)
16	7.45A	29,528	65	82,8	83,2	thick	5	NE ½ E	3		
	2,15P	29,460	57,5	85	87,3	thunder	10	NNE	4		(n)
17	7. A	29,472	64	81	80,2	thick loose	10	NE	2	,475	(o)
	2.10P	29,493	61,5	84,5	88,2	thick	8	SW by S	5	,025	
18	6.15A	29,580	63	80,5	78,5	loose	10	S	3	,583	(p)
								Carried forward,	-	5,521	

(a) About one P. it rained very heavily in town ; and very little here : the quantity is noted. 2. P. Distant thunder.

(b) This fell in a very short time. In town there was only a sprinkling.

(c) It was very gloomy in town all the forenoon ; and we had two small showers, but not any at the gardens.

(d) Of the water 5 fell last night, the rest in the forenoon to-day.

(e) It rained almost the whole day small rain.

(f) Rain in the forenoon. 11. P. And still raining hard.

(g) It has rained almost incessantly all night long ; and still rains, though it is going off.

(h) It rains very heavily. The mercury is in a falling state, so that it has been higher.

(i) This fell in the night about 15. P. and we have had a sprinkling about 11 this forenoon besides.

(k) This fell about 2 in the morning with a gust of wind and some lightning. 2.15 P. Two or three thunder showers since 9, and it now thunders.

(l) Yesterday afternoon and in the night it rained.

(m) 2 P. Several small showers with thunder.

(n) 2.15 P. Thunder at a distance.

(o) Thunder showers yesterday afternoon, and in the night, and rain this morning. 2.10 P. Showers all the forenoon of very small rain, and short duration.

(p) It has been a very tempestuous night, with frequent showers. It still rains and the wind was in general 6 and 7 in the night.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	August 1785. Miscellaneous.
								Brought forward,		5,521	
19	6.50A	29,578	67	83	84	scattered	5	SSW	4	,142	(q)
	2.30P	29,564	49	88	90,5	thick	5	SW by W	2		
20	7. A	29,580	63	83	85	thin	9	SW by S	3		
	1.41P	☽ Full									
	2.20P	29,566	40	90	93	thick	4	SW by W	4		
21	6.10A	29,576	54	83	80	thick	5	N	1		
	1. P	29,625	52,5	85	85	thunder	10	NE by E	3		(r)
	2.15P	29,578	54	84	83	ditto	10	ESE	2	,015	
22	6. A	29,588	58	83	81	thick	9	W by N	1		
	2.15P	29,556	54	85	90	thick	8	NE by N	4	,052	(s)
23	6.30A	29,570	61	83	81	thick thund.	9	N	1	,248	(t)
	2.15 P	29,576	59	83,5	86,8	thick	8	S ½ E	5	,053	
24	7. A	29,596	60	82	82	thick	7	E by S	3	,030	
	2.15P	29,598	59,5	84	86	thunder	9	S by E	3	,084	(v)
25	6.30A	29,646	62	82,5	81,5	thick & thin	9	S by E	2		
	2.15P	29,640	55	85	86,5	thick	9	SSW	2		
26	7. A	29,690	61	82,8	83	thin	9	ESE	2		
	2.15P	29,642	58	84	81,9	thunder	9	S ½ E	2	,186	
27	4.03A	☽ L.Q.									
	6.15A	29,700	61	82,5	80	thin & thick	7	SSE	3	,017	(w)
	2.25P	29,688	57,5	84,5	88,9	thick	9	S by E	3	,004	
28	7. A	29,758	61	82,0	80,9	loose	10	SE by E	2	,200	(x)
29	7. A	29,696	61	81,8	81,8	thick	6	S by E	2	,214	(y)
30	7.10A	29,704	63	83	83,2	thin	10	SW by S	2	,055	(z)
	2.35P	29,628	58	85,4	88,5	thunder	9	S by W	2		
31	5.30A	29,610	61	82	80,7	thick loose	10	WNW	1		
	2.25P	29,600	63	82,5	81	thunder loose	10	WSW	2	1,707	(aa)
								Over flow.		1,700	(bb)
	7 P									,338	(cc)
								TOTAL IN AUGUST,	-	10,661	

(q) Rain about noon yesterday, and after it ; and the conclusion of the shower yesterday morning.

(r) 1. P. Thunder at a distance ; sprinkling rain began. 2. 15 P. Thunder over.

(s) 2. 15 P. Rain about 8. A.

(t) Thunder showers since last observation. 2. 15 P. Several showers of short duration since last observation. Tides high.

(v) 2. 15 P. Several small showers with thunder.

(w) Rain with thunder yesterday afternoon. 2. 25 P. A small shower just over.

(x) Rain now falling, and some fell in the afternoon yesterday.

(y) Rain yesterday before sun-set.

(z) Rain in the night. 2. 35 P. It has thundered this forenoon ; and being then dead calm, the heat was almost insupportable. 2. 25 P. The gage cistern holds only that quantity ; how much fell I know not, but I think as much more.

(aa) The water measured to-day fell in about an hour. To-day I measured the cistern, and it holds only 1,707 ; and through the air-hole there runs out one-tenth in 40″. It is impossible, therefore, to ascertain what did fall to-day ; but that it had run out was evident ; and from circumstances I judge the quantity was as much as was measured.

(bb) Add 1,700 it could not be less, as there was a great deal of water in the garden : and besides, I know from a canal that its water rose 3,4. Yesterday it was 1,5 below the drain ; this afternoon the water ran through the drain two inches deep, and yet only three-tenths of rain fell in the afternoon.

(cc) This fell in the afternoon.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	Sept. 1785. Miscellaneous.
1	5.30A	29,60	68	81,5	80	thick	5	S by W	2		
2	7.40A	29,70	66,5	82	82,5	thick	5	S	3	,052	(a)
	2.30P	29,67	68	83,5	85	thick	10	SSE	3	,156	
3	5.30A	29.712	71	81,5	79,9	thick	3	SSE	1		
	2.20P	29,700	65	83	86	thick	6	S by W½W	3		
	10.51P	☽ New									
4	6. A	29,748	69	82	79,9	thin	5	S by W	1		
	2.20P	29,730	50,5	85	92	thick	6	S by W	2		
6	6.15A	29,772	55,5	83,5	82	thick scat.	6	SSW	2		
	2.25P	29,734	46,5	88	91	thunder	7	SW by W	4		(b)
7	5.40A	29,720	55	84	82,2	thin & thick	6	SSW	3		
	2.30P	29,714	45	87,5	89	thunder	9	SSW	3		(c)
8	5.40A	29,716	55	84	81	thin	3	S by W	2		(d)
9	5.40A	29,740	55	83	82	thin	3	S½W	1		
	2.10P	29,730	45	87,5	92	thunder	5	SW by W	2		(e)
10	7.30A	29,820	54	84,8	85	thin & thick	6	S by E	2		(f)
	2.25P	29,784	48	88	92	thunder	9	SSW	3		
11	7. A	29,782	55,5	83	81,5	thick	9	N by E½N	2		
	2. P	29.754	50,5	86	88,5	thunder	10	SW by S	3		(g)
12	1.55A	☽ F. Q.									
	6.10A	29,720	55	83,5	80,2	thunder	6	SW½S	2	,582	(h)
	2.10P	29,668	53,5	86	92	thick	9	S	2	,185	
13	5.55A	29,650	57	84	82	thick	7	S by W	2		(i)
	1.20P	29.592	55	87	93	thick heavy	9	SSE	2		
14	7.10A	29, 655	56,5	83,3	81,9	foggy	10	ESE	2	,010	(k)
	2.10P	29,608	52	86	89,5	thunder	8	SE by S	4	,002	
15	5.50A	29,600	56,5	82	80	loose	7	E by N	3	,001	(l)
16	7.15A	29,648	56,5	82	81	thin	4	E by S½S	3	,128	(m)
	2. P	29,616	54	84	86	thunder	5	E½S	2	,590	
	8.40P	29,659		83	82	thin	5	SE by E	3	,110	
17	6. A	29,630	59	82	80	thin	9	SE by E	2	,003	(n)
	2.25P	29,628	54	85	82,5	thick	10	E by N½N	1	,001	
								Carried forward,	–	1,820	

(a) A shower about 1 in the morning, with violent wind. 2.30 P. A shower about 10.
(b) Distant thunder.
(c) 2.30 P. We had a sprinkling of rain at 11, and some thunder since.
(d) Yesterday it rained hard at *Dumdum*, and to-day there was a very smart shower in *Calcutta*; only a sprinkling here.
(e) 2.10 P. Distant thunder, but approaching from the SW to SSE.
(f) About and until sun-set we had a double rainbow, but the rain was only in scattered drops.
(g) 2. P. Loud thunder in the NE.
(h) At ½ past 4 we had heavy rain from the SW. with lightning. 2.10 P. Rain about 9 o'clock.
(i) A sprinkling just over.
(k) We had a great deal of thunder last night, sprinkling rain and dead calm till day-break. 2. 10 P. We had two or three sprinklings, and some thunder.
(l) A sprinkling in the afternoon about 3. P.
(m) This water fell yesterday, and it did not rain in town. 2. P. At ½ past 12 a very heavy shower gave this water in less than 20 from SE 5. 8.40 P. This water fell about sun-set, from which time the sky began to clear.
(n) This fell in the night. 2.25 P. A sprinkling in the forenoon.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	Sept. 1785. Miscellaneous.
								Brought forward.		1,820	
18	6. A	29,648	58	81	80,5	loose	8	E by N½N	2		
	7. A	29,664	58	81	80	loose	10	ditto	2		(o)
	2.20P	29,613	56	84	85	loose	10	S by E	3	,056	
	9.57P	☽ Full									
19	6. A	29,590	59	81	80	thick loose	10	E by S	2	,003	(p)
	2.15P	29,588	61	83	87,2	thick heavy	10	S by W	2	,002	
20	6. A	29,580	62	81	80	thick loose	10	SE	2	,281	(q)
	2. P	29.576	59	84,5	89	thick	8	S by E	3	,163	
21	7.50A	29,687	61	81	81,5	thick	9	E by S	4	,387	(r)
	2.25P	29,666	60,5	84,3	87	thick	10	SE by S	4	,084	
22	6. A	29,754	62	81	79,8	thick	3	E by N	4	,016	(s)
23	7. A	29,756	62	80	80,8	thin	4	NE	1	,270	
	1.30P	29,728	58	84,7	88,8	thick	6	NW	1		(t)
24	8.15A	29,723	62	83	84,5	thick	9	NW	3		
	2.15P	29,636	55	86	89,5	thick	8	NNW	3		
25	8.50A	29,668	58	83	84	thick	5	E by S	4		(v)
	2.15P	29,583	53	84,3	86	thick	7	ESE	4	,154	
	2.21P	☽ L.Q.									
26	8. A	29,666	58	80,8	81,2	thick loose	5	ENE	3	,395	(w)
	2. P	29,608	58	82	84	thick	9	SSE varying to S by W	5	,291	
27	7.45A	29,641	61	81	81,8	thin	5	SE	3	,018	(x)
	2.25P	29,573	59	82	81	thick	10	SW	3	,130	
28	7.20A	29,600	60	81	81	thick	9	SE by S	5	,130	(y)
	2.15P	29,556	62	83	85,5	thick	10	SSE	5	,009	
29	6.30A	29,638	63	81	79,5	thick	10	S by E	2	2,640	(z)
30	6.30A	29,680	61	78,2	79,9	thick hard	4	SW ½ W	3	,182	(aa)
	12. P									,001	
								Total in September,		7,032	

(o) 7. A. A small rain. 2.20 P. Rain in the forenoon, several small showers.
(p) This fell yesterday before sun-set. 2. 15 P. Rain in a short sprinkling this forenoon.
(q) Rain yesterday evening, and in the night: it still rains scattered large drops. 2. P. Rain in the forenoon.
(r) Rain with thunder at 5. P. again in the night twice, and since day also. 2.25 P. Two or three showers since last observation.
(s) Rain in the afternoon yesterday. Rain twice to-day.
(t) 1.30 P. The wind has varied round and round, though hardly perceptible.
(v) The night was dead calm till about an hour before dawn, and then we had a storm from the NE. with lightning. 2.15 P. A shower just over.
(w) Rain at 4. A. and again at sun-rise. 2. P. Flying showers all the forenoon.
(x) Rain yesterday afternoon. 2. 25 P. Several smart showers since last observation.
(y) A very stormy night, with frequent showers. 2. 15 P. Two or three showers since morning, but all momentary, and small.
(z) Before 11 o'clock P. we had rain 15. Between 12 and 1 there came on a violent rain, attended with thunder, lightning, and wind, which varied round and round; it produced 1,25; before three 1,20, and the rest since. It still lowers, and threatens.
(aa) Several showers yesterday, and one in the night. 12. P. A sprinkling to-day.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	October 1785.	Miscellaneous.
1	8. A	29,826	58,5	81,2	81·5	thin	4	WNW	2			
	2.10P	29,770	50	84	87,5	thin	2	W by S	3			
2	7.45A	29,840	56,5	80,5	80,5			SW½S	2			
	2.20P	29,797	37	83	86			WNW	3			
3	6.15A	29,790	53	80,5	82	thin	7	SW by S	2			
	3.54P	☽ New										
	5.30P	29,764	46	84	84,5	thunder	5	WNW	3			(a)
4	7.15A	29,845	54	81	80	thick scat.	4	NW	2			
	2.20P	29,824	49	84,3	87,3	thick	6	WNW	2			(b)
5	7.30A	29,875	54	82	81,5	thin	2	SE by S				
	2.15P	29,833	43	86	90,5	thick	6	SSW	2			
6	6.50A	29,910	52	82	79	thin	1	S	1			
7	6. A				78,5							
	7.40A	29,872	51	82	81,5			SW				
	2.30P	29,790	45	86	89·5	thick	6	WNW	2			
8	7.15A	29,858	50	81	78	thunder	8	E½N	1	,331		(c)
	2.30P	29,773	45	85	88,5	thick thund.	8	NE	2			
9	6. A	29,86	52	80,5	78	thick	3	NE	2	,335		(d)
	2.25P	29,799	50	81,7	87,5	thunder	9	S by E	3	,268		
	10.30P									,455		
10	5.35A	29,873	55	78,2	75,5	thick	4	ENE	2	,002		(e)
11	6.15A	29,907	56	80,5	78,6	thick scat.	7	E	2			
	2.20P	29,863	52	84	88,5	thick	6	NNE	3			
	2.46P	☽ First										
12	7.15A	29,902	55	81,2	81	thin	2	W½N	1			(f)
	2.25P	29,868	47	84,3	87,5	thick	6	NW	1			
13	6.30A	29,900	53	81,5	79	thin	2	NW½W	2			
14	7. A	29,894	53	81,5	80			W by S	2			
	2.20P	29,848	46	84	88,9	thick	8	WNW	2			
15	7. A	29,892	53	82	79,9	thunder	3	NW by W	2			(g)
	2.15P	29,878	45	86	89	thick thund.	6	NW½N	3			
16	6.45A	29,848	52	81,5	80	thin	4	N	2			
	2.25P	29,897	46	86	88,5	thick	6	N	3			
								Carried forward,	–	1,391		

(a) 5.30 P. Rain in the North.
(b) 2.20 P. Very sultry.
(c) There was much lightning in the North, with distant thunder, and at 4 we had a thunder shower.
(d) A thunder shower about sun-set. 2.25 P. Rain began at 3, and continued till near 9; it came from the NE. with a very sudden change.
(e) Whether this was rain or dew I do not know.
(f) At 6.30 A. The thermometer out of doors 78,7.
(g) Thunder at a distance twice this morning.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	Oct. 1785.	Miscellaneous.
								Brought forward,		1,391		
17	6.20A	29,928	50	80,7	78,2			N by E½E	2			
	2.5 P	29,885	42,5	85	86,5			N	4			(h)
18	6.46A	☽ Full										
	6.50A	29,914		79				N	1			(i)
	2.30P	29,878		86				N	3			
19	6.30A	29,872		79				NNE	2			
	2.30P	29,856		86				N	1			
20	7.30A	29,900		80		thick	10	N	2			(k)
	2. P	29,832		86		thin	5	N	2			
21	8. A	29,92		81,7		thin	3	N Eastly	3			
	2.30P	29,864		87,5		thick & scat.	5	N	4			
22	6.20A	29,884		78				N	3			
	2.40P	29,828		87				NNE	4			
23	6.20A	29,892		77,5		thin	4	N	3			
	2. P	29,864		87		thin	3	NE	3			
24	7.10A	29,936		79,5		thin	6	NNE	2			
	2. P	29,903		85,5		thin	4	NNE	2			
25	4.45A	☽ L.Q.										
	6.30	29,913		78,5		thin	4	NE	9			
	2.10P	29,900		88		thick scat.	3	N	2			
26	6.40A	29,874		80,5		thick & thin	4	NE	2			(l)
	1. P	29,860		88		thunder	8	SE	1			
	1.25P	29,866		86		thunder	9	SE	4			
	1.40P					thunder	10	SE	6			
27	7. A	29,840		78,5		thick loose	10	NNE	1	,920		(m)
	2. P	29,780		83		thick	10	NE	2	,456		
28	7. A	29.724		77		loose foggy	9	NNE	3			
30										,084		(n)
31										,012		(o)
								Total in October,	–	2,863		

(h) 2.5 P. Quitted the gardens this evening.
(i) First observation in *Calcutta*.
(k) The clouds began to collect yesterday about 9 A.
(l) Foggy. 1. P. Distant thunder. 1.25 P. Do. and rain coming on. 1.40 P. Rain began in large drops.
(m) The rain fell heavily, and continued till about three, and produced the water above at the gardens. It has rained in the night, and I heard it at day-break, and it drizzles now 2. P. Smart rain. This water was measured in the morning.
(n) Rain at day-break.
(o) Rain at noon.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Nov. 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
2	7.15A	29,947		80		thick	4	N	1		
	9.33A	☽ New				thick	8	ESE	3		
	2.30P	29,912		85,5				N	2	,003	(a)
3	8.30A	29,964		80		thick	6	NE	3		
4	8.15A	29,936		79,3		thick	8	E	3		
	2.30P	29,840		81,7		thick	10	N	3	,001	(b)
5	9. A	29,924		78,3		thick	9	N	2		
	2.20P	29,802		82,3		thick	8	E	1	,019	(c)
6	6.40A	29,850		78		thick	10	NE	1		
	2.20P	29,820		81,8		Studded	6	N	2		
7	7.40A	29,914		78,3		thick	8	NNE	2		
	2.15P	29,900		83		thick	10	NE	1		(d)
8	7. A	29,932		78,8		thick	10	NE	3		
	2.10P	29,881		79,5		thick	9	N	2	1,000	
9	7. A	29,940		74,3		thick	8	NNE	3		(e)
	2.10P	29,896		77							
10	1.43A	☽ L.Q.				none		N	2		
	7.40A	29,936		73		white scat.	3	NW	2		
	2. P	29,936		77,8				N	2		(f)
11	7. A	30,022		74		thick white sc.	6	NW	2		
	2. P	29,988		80		thick	3	NNE	2		
12	8. A	30,118		75		thick	4	NNE	2		
	2.30P	30,036		79,3		thick	3	N	3		
13	8. A	30,118		74,3		scattered	3	N	4		
	2. P	30,062		79				N	3		
14	7. A	30,082		71				NNW	3		
	2.25P	30,024		78				NW	3		
15	7.35A	30,005		70,5							
								Carried forward,	-	1,023	

(a) A small shower at the gardens.
(b) Small rain: the produce at the gardens.
(c) It rained last night, and the water was measured this morning at the gardens. 2.20 P. At noon there was a smart shower of rain.
(d) Very gloomy and about to rain. 2.10 P. It began to rain about 8 o'clock, and it continued till near two. The sky begins to brighten a little.
(e) Yesterday at 3. P. it began to rain, and about 4. P. to blow, and the wind increased to great violence from the N and NE. About 7 P. a blast broke the pipe of the water-gage, at which time there was 0,5 in the cistern; and the quantity that fell afterwards was estimated at 0,5. The rain was heavy at times, and continued till one the next morning.
(f) Thick fog going off.

Day.	Time.	Barometer.	Hygrometer.	Thermometer.		Clouds.		Wind.		Rain.	Nov. 1785. Miscellaneous.
				In.	Out.	Kind.	Quant.	Quarter.	Force.		
								Brought forward,		1,023	
16	6.40A	29,944		69,7							
	4.44P	☽ Full						NW	2		
17	7.30A	29,960		71,3	72,3			NW	2		(g)
	2.20P	29,96		78,3				N	2		
18	7.45A	30,036		72,5		thin	3	E	2		(h)
	2.15P	30,013		78		scattered	4	WNW	2		
19	7.20A	30,073		72		thick & thin	7	W	2		
	2.10P	30,023		78,5		thin	4	WNW	3		
20	2.15P	30,040		77,7		thin	3	NW	3		(i)
21	7.20A	30,072		71,3		thick	9	N	2		(k)
	2.10P	30,020		78		thick	6	E	2		
22	6.40A	30,038		71,5		thick	9	ENE	4		(l)
	1.50P	30,020		78		scattered	7	ENE	3		
23	7. A	29,986		72	67	thin		N	2		
	11.06P	☽ Last									
24	8. A	29,976		73		thick	10	NE	3		
	2. P	29,920		79,5		thin	6	N	2		
25	7.30A	29,942		72		thin	4	N	3		
28	6.20A				59,7			N	4		(m)
	7.10A	30,050		66,2	59,3	thin a stripe in the east		N	4		
	2. P	30,000		73		none		N	3		
29	7.25A	30,022		66.5	58	none		N	3		(n)
	2.10P	29,963		75,5				N	3		
30	6.40A	29,977		66	59			N	3		
	2.30P	29,940		77,3				NNW	3		
								TOTAL IN NOVEMBER		1,023	

(g) The thermometer out was in the sun.
(h) Thin fog.
(i) This morning was very cold, but I did not observe.
(k) It rained about three on the morning.
(l) Very sharp wind abroad.
(m) One very small cloud. 7.10 A. Foul sky in the West. 2. P. Not a single cloud to be seen; the small stripe went off before 8, and the whole day has been delightfully pleasant.
(n) Yesterday ended as delightful as it was at noon; and to-day promises to be just as fair and pleasant.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	Dec. 1785. Miscellaneous.
1	6.45A	29,988		66,5	61	thin	2	W	2		
	2. P	29,976		78,2		scattered	3	NW	2		
2	2.42A	☽ New									
	7.15A	29,956		67	62	thin & thick sc.	5	W	2		
	2. P	29,944		77,5				WNW	4		
3	7. A	30,00		69	64	thin	4	WNW	2		
	2.20P	29,86		77		thin	4	N	2		
4	7. A	30,032		66,4	59			N	2		
5	7.			65				N	2		(a)
	2. P				74			WNW	2		
6	7.10A	29,070		68				WSW	2		(b)
7	7. A				67,5			WSW	3		(c)
8	6.40A				68			WNW	2		
9	6.30A				52						(d)
	10.46A	☽ F.Q.									
	2.20P	30,044		79,5	77,5			WNW	3		
10	6.30A	29,966		57	51						(e)
15	11. P	30,060		58							
16	4.30A	☽ Full									
	6. A	30,050		53	48,5			NNW	3		
	2. P	30,040		76,3	74,8			W	1		
17	6. A	29,977		62	53	thick	8				(f)
	2. P			67	73	thick	5	NW	2		
18	6. A			62		thin	5	NW	2		
19	6. A	29,963		67	52	thin	5	N	2		
	2. P	29,944		78	78	thin	6	N	3		
20	2.20P	29,976		77	78	thin & thick	6	ENE	3		(g)
21	7. A	30,00		58	53	thick	4	E	3		(h)
	2. P	29,944		78,5	77,5	thick	8	NE	2		
22	6.30A	30,012		57,8	53			N	2		
	1. P	30,025		79,5	76	thick	9	N	3		
23	7.20A	30,003	45	64,5	61	none		NNE	2		
	2.35P	29,965		72	75			NNW	2		(i)
	8.01P	☽ L.Q.									
24	7. A	30,024	43	67	60			NW by N	3		
25	6.40A				59,5			NNE	3		
26	6.30A				55			NW	2		
27	6.30A				55			WNW	2		
	2.30P	29,934			73			WNW	3		
29	8. A	30,088		69	59			NW by W	2		
	2.40P	30,002		71,2	74,7			WNW	3		
31	6.31P	☽ New									

(a) At *Purree Baugh.*
(b) Foggy.
(c) Foggy.
(d) At *Dumdum* in tents: thermometer wet with the dew.
(e) Very thick fog.
(f) Last night the wind was South of the West. At the gardens.
(g) In the morning it was E. 4.
(h) Excessive fog, but going off.
(i) At the gardens.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	Jan. 1786. Miscellaneous.
1	7. A	30,128		72,5	60			WNW	2		
3	8. A	30,116		70	63,5			W½S	2		(a)
4	8. A	30,114		69,7	62,5	thin	5	W by N	2		
	1.10P	30,064		71,5	74	thin	6	WNW	2		
5	8.48A	30,144		69,5	66,5	thin	2	NW	3		
6	8. A	30,212		69	61			N	3		
	2.30P	30,172		75,5	75			N½W	4		
7	8.10A	30,248		68,5	59			NNW	3		
	6.37P	☽ First									
11	2. P	30,042		69,5	73,5			N	3		(b)
12	9. A	30,107		64	61	thin	2	NW	3		
	3. P	30,004		72	73	thick	3	NW by N	2		
13	8.30A	30,078		59,5	66,5	none		NW	3		
	2.15P	29,998		69	73			WNW	2		
14	8. A	30,124		67,6	57			NW	3		
	2.15P	30,074		70	72,5			WNW	3		
	6.30P	☽ Full									
15	7.30A	30,124		66	56,5			NW½N	3		
	2.30P	30,050		70,5	72,3			NW by N	3		
16	6. A				52			NW	3		(c)
	2.20P				78			NW	3		
17	6. A				50			NNW	3		
	2. P				79			NW	3		
18	6. A				49			NW	0		(d)
19	7. A	30,040		66,5	56,5			NW	2		(e)
	2.20P				82			WNW	4		
20	6.30A				50			W	4		
	2. P				80			W	4		
22	5.42P	☽ Last									
23	6. A				47			N	3		(f)
24	6. A				50			ENE	2		
25	6. A				60			S	2		
26	7. A				68			NW	2		
	2. P				84						
27	8. A				64						
	2. P				87			W	1		
29	7.45A				65			NE	3		(g)
	2.50P				85			NNE	3		
30	8.00A	☽ New									
	8.32A				64	thick scat,	4	WSW	1		(h)
	2.35P				83			NNE	4		

(a) A fog so thick hardly any thing is visible.
(b) To-day at day-break it was 52 at *Dumdum.*
(c) Foggy, and piercing by cold.
(d) Fog, and thermometer wet: the air mild to the feeling.
(e) Foggy.
(f) Thermometer wet with dew.
(g) Thermometer wet with dew.
(h) Sun eclipsed, going off.

Day.	Time.	Barometer.	Hygrometer.	Thermometer. In.	Thermometer. Out.	Clouds. Kind.	Clouds. Quant.	Wind. Quarter.	Wind. Force.	Rain.	Feb. 1786. Miscellaneous.
1	7.15A	29,994		72,3	67			SW	2		(a)
2	6.50A	29,927		69,5	66	thick	3	SSW	3		(b)
3	7.45A	30,036		67,5	63,5			N by W	3		
	2.30P	30,009		76	75			NW	4		
4	6.30A	30,047		67	55			WNW	3		
	2.30P	30,060		77	75			NW by W	4		
6	2.22A	☽ First									
	6.40A	30,100		67	58,5			W	3		
	2.50P	30,078		78	77			NW	4		
7	7.00A	30,078		66	57,5			NW½N	3		
	3.30P	30,020		73	77,5			NW½N	3		
8	7.15A	30,068		66	59			NW½N	3		
10	6.50A	30,084		68	58			WNW	3		
	2.40P	30,087		79	79,3			W by N	3		
11	6.50A	30,094		69	59			W by N	3		(c)
	2.30P	30,026		71	80,7			E½S	3		
12	7.50A	30,00		69,3	65,5			N	2		
13	7.30P	30,00		73,2	68,3			SW by S	2		(d)
	10.35A	☽ Full									
	2. P	29,956		80,5	81,3			SW	2		
14	5.50A	29,970		71,5	66			S½E	2		(e)
15	1.40P				86	thick	6	S	4		(f)
16	7. A				64	thick	3	ESE	2		(g)
	2 10P	29,914		76	79,5	thunder	10	SSW	2		
	6. P									,1600	
17	7.50A	29,952		70,3	64,3	thick	10	SE	5	,4200	(h)
18	7.40A	29,992		65,5	61,3	thick scat.	5	NNE	3	,1750	(i)
19	8.10A	30,02		65	65			WNW	4		
21	7.40A	29,892		69	65,4			SW½S	3		
	2.11P	☽ Last									
22	6. P	29,882		77	77	thick thund.	7	S	3		(k)
23	8. A	29,970		74	75	thick	10	SSW	3		(l)
24	2.30P	29,982		76	80,8	thick	6	NW	3	,1810	(m)
25	8. A	30,062		74	73,5			S by E	2		
	2.30P	30,000		78	82	thick	4	ENE½N	2		
26	7.15A	30,076		73	69,3	thick	10	NNW	2		(n)
	2.30P	30,066		78,5	80,5	thick	10	W by E	3		
27	7.10A	30,095		72,5	70,3	thick	10	NW	2		
28	2.20P	30,058		77	85	thunder	6	W	2		(o)
	8.20P	☽ New									
						TOTAL IN FEBRUARY, -				0,936	

(a) Excessive fog.
(b) Thick fog rising into clouds.
(c) Foggy.
(d) Excessive fog.
(e) Excessive fog.
(f) The clouds have been thick 9 and it looked as if it was about to rain.
(g) Foggy (at *Dumdum*). 2.10 P. (At the gardens) thunder coming on, and drawing near. 6. P. Rain had begun in drops when last observation was made. There was thunder, but not any thunder gust.
(h) It has been a very tempestuous night, with excessively heavy thunder, and of very long continuance; the thunder shook the whole house several times.
(i) This fell in the last night.
(k) The wind has been S. 6 the greatest part of the day.
(l) It lightned a good deal till 8. P. and then cleared suddenly.
(m) This water fell in a thunder shower last night, from the W and NW. with much lightning, though but little wind.
(n) Much lightning in the former part of the night, and a gust of wind from N, about 11.
(o) Very heavy fog this morning, and a mass forming.