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NARDUS INDICA.

Illustration of the plant and its root system.

from the Author.
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ON

THE SPIKENARD

OF THE

ANCIENTS.



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ON
THE SPIKENARD OF THE ANCIENTS.

BY

CHARLES HATCHETT, Esq. F.R.S. &c.

THE History of the *Nardus Indica* or Spikenard of the Ancients had been long involved in doubt and obscurity, until the late Sir Gilbert Blane made a communication upon the subject in the year 1790, to the Royal Society, and satisfactorily corroborated the opinion of Linnæus, who in his system, had arranged it in the order of Grasses;—and although Sir William Jones, in a Paper published in the Second Volume of the Asiatic Researches, arguing as a Philologer, rather than as a Botanist, did not agree with Linnæus, but thought the true *Nardus Indica*, to be a plant known in India by the name of *Jatamansi*, yet taking all circumstances into consideration, there is every reason to believe that Linnæus was in the right when he classed it with the Grasses, and the facts detailed by Sir Gilbert Blane, with others which have been subsequently ascertained, leave scarcely any doubt, that the plant described by Sir Gilbert Blane is the true Spikenard of the Ancients.

Sir Gilbert Blane was enabled to communicate this information, in consequence of having received a letter with a well preserved

dried specimen of the plant, from his brother who was residing at Lucknow, and Sir Joseph Banks having carefully examined it, pronounced it to be a Species of those Grasses called by Linnæus *Andropogon*, but different from any other of that genus hitherto described in botanical systems, and different from any plant usually imported under the name of *Nardus*.*

Mr. Blane of Lucknow, in his letter to his brother, dated December 1786, states, that when travelling with the Nabob Visier upon a hunting excursion towards the Northern mountains, he was one day surprised by perceiving the air perfumed with an aromatic odour, and upon asking the cause, he was told that it proceeded from the grass trodden and bruised by the feet of the elephants and horses of the Nabob's retinue.

Mr. Blane collected some of the roots and planted them in his garden at Lucknow, where they throve, and in the rainy season shot up spikes six feet in height, one of which was the specimen sent by him to his brother, and subsequently examined by Sir Joseph Banks.

The manner by which Mr. Blane was induced to notice this plant, singularly corresponds as Sir Gilbert Blane observes, with an occurrence stated by Arrian in his History of the Expedition of Alexander the great into India, Arrian relates that during the march of the army through the deserts of *Gadrosia* now called *Makran*, a maritime province of Persia situate between *Kerman* and the River *Indus*, being the frontier of Persia towards India, the air was perfumed by the *Spikenard* which was trampled under foot by the army, and that the *Phoenicians* who accompanied the expedition, collected large quantities of it to carry to their own

* Pomet (*History of Drugs*) and Lewis (*History of the Materia Medica*) also speak of the *Nardus Indica* as a species of Grass, and carefully distinguish it from the *Nardus Celtica*, which is a small species of Valerian, and from the *Nardus Italica* which is a Lavender.

country as an article of merchandise, which circumstance seems to ascertain it to have been the true Nardus, for the Phœnicians who even in war appear to have retained their genius for commerce, could without doubt distinguish the genuine Nardus from that which was spurious.*

Since this curious and valuable Paper was communicated by Sir Gilbert Blane to the Royal Society, not any additional information appears to have been obtained respecting the plant, nor of the Oil and Ointment of Spikenard so much valued by the ancients, for the purposes of medicine and luxury, until my friend Samuel Swinton, Esq. arrived in this country, after an uninterrupted residence in India of thirty-four years, during which, he had rendered most important services to the East India Company, which services have been repeatedly acknowledged.

This gentleman in the year 1830, presented me with some Oil of Spikenard, the first ever brought to this country, and at the same time communicated to me the following information.

During Mr. Swinton's residence in Malvah, he was attacked most severely by rheumatism, and after much suffering, was advised by some of the principal natives to seek relief by using as an embrocation a precious oil called by them *Rhonsee Ke Teel* (*Oil of Grass*) which proved to be Oil of Spikenard, and having become satisfied of its efficacy, he was induced to send some of it to his cousin George Swinton, Esq. the Government Secretary at Calcutta, who put it into the hands of Dr. (now Sir William Russell) and another eminent Physician, for the purpose of making farther trial of its medicinal properties, and these gentlemen having so done, corroborated the account given of its efficacy by the natives of Malvah, and the beneficial effects which Mr. Swinton himself had experienced.

This Oil appears to have been little if at all known beyond the

* Arrian: Lib. 6, Cap. 22, pp. 453, 454.

District in which it is prepared, so that either from accident or from secrecy purposely observed by the natives, it seems to have been unknown at the seat of Government until Mr. Swinton made the communication to his cousin at Calcutta.

Upon my showing the engraved plate of the plant which accompanies Sir Gilbert Blane's Paper in the Philosophical Transactions to Mr. Swinton, he immediately declared it to be the same as that from which the Oil is obtained, and stated that although the plants are found in other parts of India as well as in Malvah, yet those which grow about the Jaum Ghaut are preferred, and are gathered in the month of October, when the seeds forming the ears or spikes have become fully ripe. At that season, however, in the places where this gigantic grass is produced, the jungle fever is so prevalent, that the peasantry who collect it will not expose their health and lives to imminent danger, unless tempted by very high remuneration; this, and not the scarcity of the plant, seems to be the cause of the high price which the Oil bears, and which consequently precludes it from being used by any excepting the superior class of natives.

Mr. Swinton was informed by them that it has been prepared in and about Malvah time immemorial, at first probably by the Parsees, although at present it is entirely in the hands of the Borahs, a very commercial people, forming a sect of Moslems whose chief resides at Surat. The Oil is obtained from the spikes, which when ripe, are cut with a portion of the stem about one foot in length, and are then subjected to distillation.

Only a small comparative quantity of the Oil is consumed by the natives, the greater part being now as was the case in very remote times (according to tradition) sent as an article of commerce to Arabia, from whence no doubt it found its way to Tarsus, to Laodicea, and other places in Syria and Asia Minor, where the celebrated Ointment was prepared. This Ointment is described to have been

a thin fragrant liquid variously prepared, but in which Spikenard was always the principal ingredient. Whether the plant Spikenard was digested in any sort of expressed oil like that of olives or whether the distilled oil was employed cannot at this distance of time be determined, but which ever might have been the oil, it appears to have been formed into the ointment by the addition of other fragrant substances such as *Costus Orientalis*, *Amomum*, *Myrrh*, and *Balsam of Gilead*.

It seems that the Ointment was prepared at few places, chiefly *Tarsus* and *Laodicea*, the knowledge of the ingredients and of the process being probably confined to a small number of persons, which will account (the high price of the Oil being also considered) for the great value of the Ointment, which indeed was such as *Horace* observes, that as much as could be contained in a small box of *Onyx* or *Agate* was considered as equivalent to a large vessel of wine* and regarded as a handsome quota for a guest to contribute at an entertainment according to the custom of antiquity; larger quantities were kept in boxes or vases of *Alabaster*. The Oil of Spikenard was not only in great request as an article of luxury amongst those who could afford to purchase it, but was also in great estimation on account of its valuable medicinal properties.

All the ancient writers on medicine and surgery such as *Hippocrates*, *Celsus*, and *Galen* recommend the internal and external use of it for pains in the stomach and bowels; but *Sir Gilbert Blane* when he wrote his valuable paper, was evidently unacquainted with any essential Oil of Spikenard, such as *Mr. Swinton* has ascertained had so long been known and prepared in *India*; for *Sir Gilbert* observes “ It may here be remarked, that as its sensible qualities do not depend on a principle so volatile as essential oil like most

* —“ *Nardo vina merebere.*

Nardi parvus onyx eliciet cadum.”

Ode 12. Lib. 4.

other aromatic vegetables, this would be a great recommendation to the ancients, as its virtues would be more durable, and they were not acquainted with the method of collecting Essential Oils being ignorant of the art of distillation ;” yet after this remark, Sir Gilbert goes on to mention a circumstance which proves that the Oil of Spikenard was well known to the ancients, for having mentioned the names of Celsus and of Galen, he observes “that the first occasion on which the latter (Galen) was called to attend Marcus Aurelius, was when that Emperor was severely afflicted with an acute complaint in the bowels, answering by description to what we now call cholera morbus, and the first remedy he applied was warm Oleum Nardinum on wool to the stomach ; he was so successful in the treatment of this illness, that he ever afterwards enjoyed the highest favor and confidence of the Emperor.”

At the present time, the natives of that part of India where it is known, not only regard the Oil as a valuable external remedy, but likewise consider the plant to be highly efficacious in fevers when given internally, for which purpose (according to Mr. Blane of Lucknow) they infuse about a dram of it in a pint of hot water with a small quantity of black pepper ; this infusion serves for one dose, and is to be repeated three times during the day. It is esteemed a powerful medicine in all kinds of fevers whether continued or intermittent.*

The odour of the plant is so powerful, that although camels will eat almost any vegetable, yet they will not browse on this, nor will insects approach the Oil, which is highly fragrant. The perfume of the Ointment is thus described by St. John (Chap. 12 Verse 3) “ Then took Mary a pound of Ointment of Spikenard very costly

* A considerable part of this little tract, as far as concerned the history of Spikenard, was expressly written by the author for that most excellent woman the Right Honorable Lavinia late Countess Spencer, and the manuscript (now probably at Althorp) was presented to her Ladyship in February 1831.

and anointed the feet of Jesus and wiped his feet with her hair, and the house was filled with the odour thereof.”—The following passage also enables us to ascertain, what at that time was the value of the Ointment. “Then saith one of his disciples Judas Iscariot, Simon’s son, who should betray him, why was not this Ointment sold for three hundred pence and given to the poor.” St John. chap. 12 verse 3, 4, 5. Hence we learn that at the time in question, a pound of this precious Ointment was valued at three hundred pence according to the translation in the English New Testament, for I must here observe that whenever the coin called Denarius happens to occur, as in St. John above mentioned, in Matthew, chap. 20 and 22, and in Luke, chap. 10, the English translators have invariably employed the term penny, having evidently in these, as well as in some other instances, been induced to do so by following that which is called Luther’s Bible.*

* The first English Bible allowed by Royal Authority, and in fact the first translation of the whole Bible printed in our language, is that which Miles Coverdale (afterwards Bishop of Exeter in the reign of Edward VIth) translated, printed, and dedicated to Henry VIIIth in the year 1535, being the year after the King’s Supremacy had been settled by Parliament.

In setting forth this, which he calls a special translation, Coverdale says, that he humbly and faithfully followed his interpreters, of which he states that he had recourse to five who had translated the Scriptures not only into Latin but into Dutch, by which no doubt he means German. It is quite evident that he principally looked to this, and that his translation was made almost word for word with that which bears the name of Luther, who then was living in the height of his celebrity, and was no longer regarded as a Heresiarch by that capricious tyrant Henry VIIIth, for had it been otherwise, the head of Coverdale would have been in no small danger.

Whenever the coin Denarius occurs in the New Testament, it is invariably by Luther translated *Groschen*, and Coverdale following him, first sets the example to the subsequent English translators by translating *Groschen*, into *Peny* according to his Orthography.

Matthew. Chap. 20. “And whan he had agreed with his labourers for *a peny a daye*.”—

Matthew. Chap. 22. “Shewe me $\frac{e}{7}$ tribute money, and they toke *hī a peny*.”

Whether from reverential feeling towards Luther as the great Reformer, or to save themselves trouble, they certainly seem to have made their translation, principally if not intirely from his German translation, and like Chinese painters have faithfully copied his errors.

Whatever may have been Luther's motive, he has invariably

Luke. Chap. 10. "Upon the next daye whan he departed he *toke out two pens and gave them to the Oost.*"

John. Chap. 12. "Why was not this Oyntment solde *for thre hundreth pens and given to the poore.*"

But as an additional proof to show how closely Coverdale has translated from Luther, I will refer to the seventh verse of the third chapter of Genesis, where in our Bibles we read "*and they sewed fig leaves together and made themselves aprons,*" this being in exact conformity with Coverdale's words "*and sowed fygge leaves together and made them Apurns,*" these same words are also to be found in that which is called Matthewes Bible of 1538 being an improved Edition of that of 1537. The like expressions also appear in the other Bibles such as Taverner's, Becke's, &c. &c. But in the Biblia Hebraica of Montanus the latin words placed over each of the hebrew words run thus "*Et consuerunt folia ficus et fecerunt sibi Cingulos*" and in the Vulgate the words are "*consuerunt folia ficus et fecerunt sibi perizomata,*" the plain and unaffected translation of which would naturally be "and they sewed fig leaves together and made themselves girdles," this last being a word understood by every body. I was therefore not a little curious to find out why Coverdale had employed the word Apron, and suspecting from other circumstances that he had taken it from Luther, I referred to this latter's German Bible and there found the very words "*und machten ihnen Schürtze*" and made themselves aprons.

Now there could not be any reason why this deviation was made from the original text by Luther, for all the German people would have understood the word Gürtel as readily as we understand the English word Girdle, and consequently the marginal note "*or things to gird about*" which we find placed opposite the word aprons in many of the English Bibles published since that of Coverdale, would not have been required. Even if they had employed a general phrase such as "*and they made themselves coverings*" it would have been better than the word aprons, for this last seems to have suggested another reading, which by every body is regarded as truly ludicrous, "*and they made themselves breeches,*" as may be seen in the Bible called on this account the Breeches' Bible "Imprinted at London by the Deputies of Christopher Barker Printer to the Queenes most excellent Majestie. Anno 1597.

translated the latin word Denarius by the German word Groschen, which is a small German coin;* for instance in the parable of the good Samaritan he thus translates, v. 35 Luke, chap. 10—“ *Des andern Tages reiset er und zog heraus zween Groschen und gab sie dem Wirth,*” and the three hundred Denarii mentioned by St. John he translates “ *Drey hundert Groschen,*” three hundred Groschen; perhaps he thought that the German people would not understand the meaning of the word Denarius, and he therefore substituted Groschen with which they were well acquainted; but if the English translators had adopted the word Groschen, the people of England would not have understood it, and therefore with equal inaccuracy they substituted the word Penny.

In many Editions of the English Bible there is a marginal note stating that the Roman Penny, as they chuse to call it, was the 8th part of an ounce of silver, and was worth sevenpence halfpenny of our money; this, if attended to, serves in some measure to correct the error as to value, but affords no sort of excuse for copying Luther's translation, and for attempting to translate the word Denarius, which being the specific name of a coin is not translatable. Even the Greeks did not attempt to translate it, and yet if they had thought proper to have substituted the word Drachma for Denarius, there would have been something like an approximation to the truth, for the Attic Drachma and the Roman Denarius were in weight and value so nearly alike, that the Greek Physicians when they came to practice at Rome, employed the Denarius as a weight for their medicines, in place of the Attic Drachma to which they had been accustomed when in their own country.

The Denarius was the chief silver coin of the Romans, and in

* In different parts of Germany the Groschen differs in value from $\frac{1}{12}$ to the 36th part of a dollar varying from about two pence three farthings to one penny and a half.

weight was the seventh part of the Roman ounce, equal to about 62 grains 4-7ths or in round numbers sixty two grains;* this was the Denarius coined in the reigns of Augustus and Tiberius, but subsequent depreciations took place down to the reign of Vespasian, when eight Denarii were coined from one ounce of silver. In the time of Christ the Denarius was of the higher value, and may be estimated at not less than seven pence three farthings of our money, a pound therefore of the Ointment of Spikenard being valued at 300 Denarii, would be worth £9. 13s. 9*d.* a large sum in a cheap country like Palestine, where, Mr. Tillemont and other writers assert, that a person in those times might live luxuriously on one Denarius per day, and it therefore follows that the two Denarii stated in the parable to have been given by the good Samaritan, being equal to fifteen pence halfpenny of our money, were fully adequate to supply the wounded man with all requisite nourishment and comfort for more than two days, when he probably would have recovered from the injuries he had sustained and would be enabled to resume his journey.

From all that has been stated concerning the Ointment of Spikenard, it is not surprising that its price should have been great, and we accordingly always find it denominated “precious or costly” by the Ancients. The Oil as prepared by the natives of Malvah is also costly, and if the tradition preserved amongst them respecting the distillation of it can be relied upon, and there does not seem any reason why it should be doubted, we may justly suspect, that the art of distillation was known and was practised by the natives of Hindostan long before it was known by the Arabians, who have generally been supposed to have invented it, but undoubtedly the Arabians borrowed much from other nations, and especially from the people of India, without acknowledging

* Arbuthnot, Tables of Ancient Coins; and Hooper on Ancient Measures, &c.

their prior claims excepting to the invention of the game of chess and of modern arithmetic.*

It must however be allowed, that much is due to the Arabians for their eminent services in promoting the advancement of science, and Europe derived much advantage from this, for in the 13th century Roger Bacon and Albertus Magnus cultivated the sciences, especially chemistry, being, as Bishop Watson observes, probably incited thereto by the perusal of some Arabic books which about that time were translated into Latin, and in fact those two monks, especially Bacon, seem to have as far exceeded the common standard of learning of the age in which they lived, as any philosophers who have appeared in any country either before their time or since.

In those dark ages the small portion of literature and science possessed by some of the European nations had taken refuge in the cloysters, but it is remarkable that whilst the people in general were plunged in gross ignorance and barbarism, a very different scene was exhibited in the residence and at the Court of the Caliphs at Bagdad.

During the reign of the Omniades, the studies of their subjects were chiefly confined to the interpretation of the Koran and to the cultivation of eloquence and poetry, but when the Caliphate became possessed by the Abbassides, a very material change took place, and profane science as it was called was sought for, and was cherished with intense curiosity and ardor.

* Maxime Planude, moine comme Barlaam, fit quelque chose de plus utile en expliquant a ses compatriotes les principes de notre arithmetique moderne, son ouvrage qui existe manuscrit dans diverses Bibliothèques étoit intitulé *Ψηφογορια κατα Ινδους, η μεγαλη λεγεται* *logistica secundum Indos quæ Magna dicitur* ; car c'est des Indiens comme nous le remarquerons ailleurs, et par l'entremise des Arabes, que nous tenons cette ingenieuse invention.

Le Moine Planude écrivoit dans le 13^{me} siècle.

Histoire des Mathematiques par J. F. Montucla. Tome I. pp. 344-345 and 376.

They were encouraged in these pursuits by the Caliph Almansor and by the celebrated Haroun Al-Raschid, but when, as Mr. Gibbon observes, the sceptre devolved to Al-Mamon, the Seventh Caliph of the Race of the Abbassides, “ He completed the designs of his grandfather (Almansor) and invited the Muses from their ancient seats. His ambassadors at Constantinople, his agents in Armenia, Syria and Egypt, collected the volumes of Grecian Science (and we may truly say of other nations); at his command they were translated by the most skilful interpreters into the Arabic language; his subjects were exhorted assiduously to peruse these instructive writings, and the successor of Mahomet assisted with pleasure and modesty at the assemblies and disputations of the learned.”*

It is therefore not surprising that persons eminent for learning, invited by the liberality and affability of Al-Mamon, flocked to the court of that accomplished and amiable Sovereign.†

* “ Les Mathematiques en general, et surtout l’Astronomie lui eurent des obligations particulieres. Les Arabes lui doivent la première traduction en leur langue de presque tous les Mathematiciens Grecs. Al-Mamon fut même fort versé en Astronomie, suivant les Historiens, on lui attribue une Observation de l’obliquité de l’Ecliptique. Ce fut sous ses auspices qu’on mèsura la terre avec plus d’exactitude qu’on n’avoit fait jusqu’ alors. Cette belle operation fut executée dans une plaine immense sur les bords de la Mer Rouge. Des Géometres habiles mèsurerent par ses ordres la coudée a la main une étendue d’un Degré du Meridien, qu’on trouva de 56 milles $\frac{2}{3}$ dont chacun contient 4000 coudées. Quoique l’ignorance ou nous sommes du rapport de ces mèsures avec les nôtres rende ce travail infructueux pour nous, il ne laisse pas d’être memorable.”—Moreri, Dictionnaire Historique.

† “ Quod ad naturam ejus (Al-Mamunis) attinet, fuit omni modo excellens, liberalis, magnæ clementiæ, et boni regiminis, neque inter Abbassidas fuit quisquam eo eruditior, nec præstantior.”—Georgius El-Macin Historia Saracenicæ, Lib. II, p. 139.

“ Mamun Ben Rasched amabat scientias et sapientes ac viros celebres: ejus tempore translati sunt multi libri ex Greca lingua in linguam Arabicam.”—Rabbi Abraham Sachur, libro Inchasin, vide L’Histoire de la Philosophie Hermetique par Langlet du Fresnoy, Tom. I. p. 69.

“ Ex dictis constat Philosophiæ inter Arabes cultæ vera et aperta initia ad Al-

Men of every country and of every religion who were distinguished by their abilities and acquirements were invited, were rewarded, and were honoured at his court;* and such was his admiration of learning, that strange to say, he actually invaded the dominions of the Emperor Theophilus in the year 830, for no other apparent reason than the refusal of that Emperor to permit Leo the learned Archbishop of Thessalonica to avail himself of an invitation on the part of Al-Mamon to visit the court of Bagdad.

That the Caliph should have made war on Theophilus for no other reason than his having prevented the visit of the learned Leo, certainly seems most extraordinary; Helen is said to have been the cause of the Trojan war, and Thais occasioned the burning of Persepolis; but how surprised would Horace have been if he had lived in the time of Al-Mamon, and had learned that the names of Helen and Thais were to be coupled with that of an old Archbishop of Thessalonica, in a sort of co-partnership concerning their respective claims as the “*teterrima belli causa!!!*”

But if this question be seriously considered, we may be allowed to observe, that enmity had long prevailed between the Caliph

Mamonis tempora referenda esse, qui ita se statorem literarum omnium maxime Philosophicarum præbuit, ut æternum sibi nomen famamque inter veteres et recentiores comparaverit; idque non immerito. Ut enim Natura dotibus eum prorsus singularibus exornaverat, quibus et imperio præesse feliciter, et bonis artibus literisque parentem se et promotorem præbere possit, ita hunc potissimum sibi Divina Providentia principem deligerat, cujus studio barbarici quæ omnem fere orbem occupare cœperat, Obex poneretur, et inter Arabes scientiarum studia excitarentur.”—

Historia Critica Philosophiæ, Bruckeri, Tom. III. pp. 31, 32.

* “*Khondomir finit le portrait de Mamon en disant qu’il fut sans contredit le plus grand et le plus renommé Prince de la Race des Abbassides, Race le plus féconde en grand personnages de toutes celle qui ont régné parmi les Musulmans. Son regne fut de vingt ans et huit mois, pendant lesquels il favorisa indifféremment toutes les personnes doctes de quelque Religion qu’ils fussent, lesquels reciproquement contribuoient beaucoup a la gloire de ce Monarque par les présents qu’ils lui faisoient des leurs Ouvrages*

and the Emperor, so that very probably the refusal of the latter to allow the departure of the Archbishop from the Imperial City, was expressed in terms and in such a manner as seemed to be personally insulting to the Caliph; this probably was the real cause, for it is quite certain that Theophilus did not detain the learned Archbishop from affection for his person, or value for his learning, since he suffered him to languish in the most abject poverty, and compelled him to seek the means of subsistence by keeping a school for some of the slaves of Constantinople.*

Possessing such an ardent love for learning, it is to be regretted that an inordinate partiality for his country, and for the language and celebrity of his people, is said to have induced Al-Mamon (after the translations had been made) to have caused the works of the Greeks and of other nations which he had obtained by so much trouble and expense to be burned, in the vain hope that the Arabic versions might be regarded as the original works, and that their merits might therefore be ascribed to his Arabian subjects.†

But supposing him to have been guilty of this weakness, the Caliph Al-Mamon must nevertheless be regarded as the bravest, the wisest, the most tolerant, the most munificent, and the most learned Sovereign of his time, whose court by its refinement, learning, and splendor, formed a Rembrandtic contrast to the thick darkness of ignorance and barbarism which at that time

recueillis de tout ce qu'il y avoit de plus rare chez les Indiens, les Mages, les Juifs et les Chretiens Orientaux de toutes les Sectes."—D'Herbelot, *Bibliothèque Orientale*.

* *L'Art de vérifier les Dates*.

† "Dolendum tamen inepto gentis linguæque suæ amore dictum Al-Mamon post conditas istas versiones Arabicas, teste scriptore Arabico Geuzi apud Leonem Africanum, *πρωτότυπα* Græca comburi jussisse. Ita enim factum est, ut solis istis versionibus standum esset, quas infeliciter satis fuisse confectas infra pluribus dicemus: et cum simili modo Saraceni, etiam in Africa circa libros Græcorum furerent, magna inde Codicum Græcorum inopia exorta, qua tot desideratissimis veteris eruditionis thesauris carere nos oportet."—*Historia Critica Philosophiæ Bruckeri*, Tom. III. p. 38.

overspread the greater part of that which is now called polished and enlightened Europe.*

* Al-Mamon succeeded to the Caliphate in 813, and died in 833 or 834. He was the second son of the celebrated Haroun Al-Raschid, and was contemporary with our Egbert and Louis le Debonnaire of France.

Al-Mansor the Grandfather of Al-Mamon laid the foundations of Bagdad, the imperial seat of his posterity during a period of five hundred years, and as Mr. Gibbon observes, Al-Mansor after his wars and buildings left behind him in gold and silver about thirty millions sterling; which treasure was, however, exhausted in a few years by the vices and virtues of his children. His son Mahadi, in a single pilgrimage to Mecca expended six millions of dinars of gold. A pious and charitable motive may sanctify the foundation of cisterns and caravanseras, which he distributed along a measured road of seven hundred miles; but his train of camels laden with snow could serve only to astonish the natives of Arabia, and to refresh the fruits and liquors of the royal banquet. The courtiers would surely praise the liberality of his grandson Al-Mamon who gave away four fifths of the income of a province, before he drew his foot from the stirrup. At the nuptials of the same prince, a thousand pearls of the largest size were showered on the head of the bride, and a lottery of lands and houses displayed the capricious bounty of fortune. The glories of the court were brightened rather than impaired in the decline of the Empire, and a Greek Ambassador might admire or pity the magnificence of the feeble Mochtader (in the year 927). "The Caliph's whole army," says the Historian Abulfeda, "both horse and foot was under arms, which together made a body of one hundred and sixty thousand men. His state officers, the favourite slaves stood near him in splendid apparel, their belts glittering with gold and gems. Near them were seven thousand Eunuchs, four thousand of them white, the remainder black. The porters or door-keepers were in number seven hundred. Barges and boats, with the most superb decorations, were seen swimming upon the Tigris. Nor was the Palace itself less splendid, in which were hung up thirty-eight thousand pieces of tapestry, twelve thousand five hundred of which were of silk embroidered with gold. The carpets on the floors were twenty-two thousand. A hundred lions were brought out with a keeper to each lion. Among the other spectacles of rare and stupendous luxury, was a tree of gold and silver spreading into eighteen large branches, on which and on the lesser boughs, sat a variety of birds made of the same precious metals, as well as the leaves of the tree. While the machinery affected spontaneous motions, the several birds warbled their natural harmony. Through this scene of magnificence the Greek Ambassador was led by the Visir to the foot of the Caliph's Throne."—Translated from Abulfeda by the learned Mr. Harris of Salisbury in his *Philological Enquiries*, and quoted by Mr. Gibbon, Vol. V. p. 420, also D'Herbelot, *Bibliothèque Orientale*, p. 595. Maestricht, 1776.

Amongst the learned men who distinguished themselves under the patronage of the Caliphs, the celebrated Geber or Giaber ought especially to be mentioned, there is much reason to believe that he was living about the year 830, which would be three or four years before the death of Al-Mamon.

Geber appears to have well deserved the title of Father and Founder of the Chemistry of the Middle Ages by the works which he wrote, combining according to the manner of his time Pharmaceutical Chemistry with Alchemy.

These writings of Geber must astonish every one, not only by proving how much he knew of Chemistry in that dark age, but also by the multiplicity of chemical instruments, operations, and productions, of which many continued to be adopted and employed in succeeding ages.

In these works Geber describes many instruments, processes, and products previously unknown, and has accompanied these descriptions with many judicious remarks. He well describes the processes of Calcination, Sublimation, and especially Distillation, and also gives an account of a variety of furnaces and vessels adapted to those purposes.

These and many more have been described by Geber, but to suppose that all of them were originally discovered and invented by him, would be exalting the inventive powers of his mind infinitely above every thing of the kind which has been possessed by man, and even such personages as Roger Bacon and Albertus Magnus whom I have recently mentioned, would appear very inferior beings when compared to him.

The question, however, is satisfactorily settled by his own candid acknowledgment that his works are only an abridged compilation from those of Ancient Philosophers.* But he has not stated who were the Ancient Philosophers from whom he had

* Totam nostram metallorum transmutandorum scientiam quam ex libris antiquorum Philosophorum abbreviavimus compilatione diversa, in nostris Voluminibus hic in

derived so much knowledge, and from all that has come down to us we have every reason to believe that he obtained but little from the traditions of the Egyptians, or from the works of the Greeks and Romans.

The Chemical knowledge of those nations may in general terms be reduced to the arts of Decoction, Digestion, Evaporation, Inspissation, Filtration, Vitrification, Amalgamation as described by Vitruvius, (Lib. 7. c. 8.) and in a very confined sense Distillation per descensum. They knew the seven principal Metals, and it must be confessed compounded some of the alloys most admirably, especially those formed of Copper and Tin; but their only acid menstruum was the acetous acid or vinegar; this is all that the most scrupulous and industrious scrutiny of learned Chemists has been able to discover, and therefore Geber could not have borrowed his enlarged notions of Chemistry from these people, nor yet from the Persian Magi, of whom indeed but little has been transmitted to us by ancient authors, excepting, that according to Diodorus, there was a College at Persepolis after the plan of the Egyptians, and that the chief attention of their learned men was directed to the visionary schemes of Alchemy.

The Chinese are not mentioned amongst those people to whom the agents of Al-Mamon were sent to seek information, and although they have from a very remote period been acquainted with many chemical arts and productions, yet from their aversion to communicate with other nations, it is not probable that the

unam summam redeigimus.—

Gebri Alch: Cap. 1, Edit. Zetzneri, 1512, but (as Bishop Watson remarks in his Chemical Essays) the words metallorum transmutandorum are omitted in Tanchen's edition, published in 1681.

This however is of little consequence, for in those times and during many subsequent ages, Chemistry and Alchemy went hand in hand together, and wherever the former was cultivated, the other to a certainty was to be found, for in fact they were in a great measure identified with each other.

Arabians obtained from them any addition to their knowledge of Chemistry.

But when we turn to Hindostan, there is great apparent reason to believe, that the people of India contributed much to enlarge the knowledge of the Arabians, and that these latter borrowed freely from them, but, in imitation of their otherwise estimable Sovereign Al-Mamon, they studiously concealed how much they were indebted to them ; we can judge by the perfection of many arts practised at this time by the natives of India, arts which have been transmitted to them by their ancestors, we may judge I say, that in remote times coeval at least if not prior to the dawning of science and of the arts in Egypt, much was known by them, and that in certain classes or castes the human mind was highly cultivated.

In works of fiction composed by the Arabians such as the Arabian nights, many of the stories are known by Oriental Scholars to have been borrowed from Hindoo Tales, Comedies, and Fables, especially those of Bidpai erroneously called Pilpay. The stories of Alnaschar and of Bedreddin have been quoted as instances of this ; but with all the concealment adopted by the Arabians, they have involuntarily given proof of their deep sense of obligation to the Indians, for whenever they have had occasion to mention them, they always have spoken of them and have described them as superior persons, and with the respect and reverence which would be adopted by pupils towards their masters.

In the story of the Enchanted Horse it is an Indian Enchanter who brings and exhibits him to the King of Persia ; and whenever an Indian of high caste, as a Brachman, is introduced, he is described almost as a supernatural being who commands the elements, and before whom, the spirits of the air, of earth, and of hell tremble, and implicitly obey his commands, as may be seen in that very amusing Persian tale of the two brother Genii Adis and Dahy.

In proof of the eminence in knowledge to which the ancient people of India had arrived, may be cited their inventions of the stupendous game of chess and of modern arithmetic, inventions which by all are conceded to the Indians, and which the Arabians never have attempted to claim.

On the contrary, one of their writers (Alsephadi, quoted by Montucla in his *Histoire des Mathematiques*) expressly mentions these inventions to the honor of the Indians, and relates that according to a very curious Indian tradition "Ardschir King of the Persians having invented the game of tric-trac and being exceedingly vain of it, a certain Indian named Sessa the son of Daher invented the game of chess and presented his chess board and chess men to the King of the Indies. The Sovereign was so much pleased that he desired Sessa to name his reward, when this man made the apparently modest request, that he should receive as a gift so much corn as could be estimated by beginning with one grain and doubling as many times as there were squares on the chess board, namely sixty four.

The King felt displeased at having his munificence thus slighted by a request so limited and so unworthy to be a gift from royalty, but as Sessa remained firm, orders were given to the Chief Minister that he should be satisfied; when however the Visir had by calculation ascertained the enormous quantity of corn which would be required, he waited upon the King and with some difficulty convinced him of the fact; upon which the King sent for Sessa and said to him that he admired his powers of calculation even more than the ingenuity of the game which he had presented to him, and in respect to his promise as to the corn he was compelled to acknowledge himself to be insolvent.

After stating this, Alsephadi enters into some very curious calculations, but as the Arabian measures were not accurately known, the celebrated Dr. Wallis, the friend of Sir Isaac Newton and

Savillian Professor of Geometry in the University of Oxford repeated the calculations, and found that the quantity of corn would be such as to be capable of being formed into a pyramid, the measurement of which would be nine English miles in height and nine similar miles for each of the four sides of its base.

After this, Montucla also states some very elaborate calculations made by himself, and proves amongst other remarkable facts, that the quantity of corn in question would cover 162,000 square leagues to the depth of one foot french measure, which at the least would be three times the extent of the surface of France as it was about the year 1796, and which Mr. Montucla estimates at 50,000 square leagues.*

From all that is known of the manufactures of India, there is abundant proof of the perfection to which various arts dependent on chemistry had been carried in early times, and as to their knowledge of Distillation I shall here observe, in addition to that which Mr Swinton learned from the natives of Malvah, that there is in the first volume of the Asiatic Researches a paper written by Archibald Keir Esq. in which he describes the method of Distillation employed by the natives of Chatra in Ramgur and the other neighbouring Provinces.

The distilling apparatus is of the simplest kind, and consists of an unglazed water jar to which as a head is fitted one of the common copper kitchen pots, and for the purpose of a tube a piece of bamboo is employed. A hole is dug in the earth to serve as a stove or furnace in which the earthen jar is placed, an aperture being left as an outlet for the smoke and to replenish the fuel. I need not enter farther into a description of this primitive sort of Alembic, as Mr. Keir's paper may be consulted, but I cannot avoid remarking, that the antiquity and generality of

* Histoire des Mathematiques par J. F. Montucla.—De L'Institut National de France, Tome 1. pp. 379-380.

the practice, and the rude simplicity of the contrivance, stamp the originality of the invention, and tend to confirm the claim of the people of India to the discovery of the art of Distillation.

The Philosophy of the Indians was highly esteemed by the ancients, especially by the Greeks, who considered these people as the masters of Philosophers; nevertheless the Greeks have not transmitted such records as can be relied upon, for as usual they seem to have introduced many of their own opinions and have confounded them with those of the Indian Philosophers; perhaps Arrian deserves most confidence, but as to Philostratus who is mentioned by Brucker and is quoted by Bergman in his learned treatise *De Primordiis Chemiæ*, it is universally agreed that his narrative can only be regarded as a tissue of Fables.

Certain it is however, and it is acknowledged by most of the ancient writers who have noticed Hindostan, that in very remote times India possessed men of deep reflection and of much knowledge.

Arrian relates in his seventh book, that when some of the Indian Sages (called by the Greeks Gymnosophists because they went naked) were brought before Alexander, they only stamped upon the ground with their feet, and being asked by the King, through his interpreter, why they did so, one of them answered "Every man, O Alexander, possesses as much earth as we now tread upon, and thou art a man no way different from others, but in making a greater stir, in being more restless, and in creating more trouble, both to thyself and others, by roving so far from thy native soil, but in a short time thou shalt die, and then shalt thou possess no more space than will serve thy body for burial."

Far from being offended, the King listened with respect, and acknowledged the force of the severe truths uttered by the Indian Philosopher.

Belle Vue House, Chelsea,

March 8, 1836.



